

## **Management Plan for Ewelme Watercress Beds Local Nature Reserve**

### **Vision statement**

In writing this plan, the Review Committee has been guided by the following shared vision for the future of Ewelme Watercress Beds Local Nature Reserve (LNR).

A site that is celebrated for its contribution to the local landscape, the creative conservation of local social and industrial heritage, and sensitive site management to aid the conservation of priority habitats and species. A place that engenders enthusiasm for all aspects of countryside conservation through the provision of public access, volunteering opportunities, and an educational programme ranging from informal guided walks to curriculum-based school and University visits



*We care for the Chilterns*

## **Management Plan for Ewelme Watercress Beds Local Nature Reserve**

**Prepared by Sarah Coulson-Phillips – May 2008**

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## **1. Introduction**

### **1.1 General information**

#### ***1.1.1 Background to the management plan review***

This is the third management plan for the site. It was preceded by a Site Management Plan for The Watercress Beds and Surrounding Land (Chiltern Society, 2004) and a Landscape Management Plan for Wetland Habitats (Highfield, 1996). There was also an outline plan produced by the Chiltern Society in 2002, prior to the 2004 plan.

A survey conducted in 2006 showed that the aims of site management were not clear to all local residents. Much of the work proposed under the 2004 plan was completed. A review of the management plan was needed and a review committee was set up in late 2007. Its remit was to produce a new plan following consultation with a number of stakeholders, including the general public. The review committee became increasingly aware of long-standing communication difficulties regarding site management. The public consultation process was therefore more extensive than originally envisaged.

On matters of best practice regarding wildlife conservation, the Review Committee has incorporated up-to-date advice from expert consultees, such as the Environment Agency, the Berkshire Buckinghamshire and Oxfordshire Wildlife Trust Water Vole Project Officer and the Chilterns Chalk Streams Project Officer. Many other individuals and organisations have contributed, and a list of consultees is provided in section 1.1.5

The main purpose of this management plan review was to define and help all interested parties work towards a long-term shared vision for the Ewelme Watercress Beds Local Nature Reserve (LNR). To achieve this it has been necessary to ensure a balance between the various management objectives and to consider the impacts of site management on village issues. It is recognised by the review committee that complete agreement from all parties on all points is impossible. Nevertheless, the committee has taken pains to negotiate compromise and achieve consensus wherever possible, without compromising the main aims, as stated below, and within relevant legal requirements.

#### ***1.1.2 Notes on the scope of the review***

The review committee were not required to produce a budgeted management plan. The budget for the site and the watercress centre remains the responsibility of the management committee, the Trustees and the Chiltern Society. In consequence the review committee has not given prescriptions for the use of the centre for activities that do not relate to the management aims for the site, as this is beyond the remit of the committee. There was no suggestion that the management plan review should be used to increase public use of the site.

The exact delineation of site boundaries is a matter for the Chiltern Society. Maps included in this plan are for illustrative purposes only. Where necessary, reference is made to maps produced for the 2004 management plan. All compartments and watercress bed/dam numbers are as mapped in the 2004 plan. The author and the review committee take no responsibility for any actions undertaken on areas of disputed land ownership.

Standard practice would be to include a clear management structure in a site management plan. In this case a detailed management structure is to be produced separately by the management committee. The diagram included in this plan is intended to illustrate a flow of responsibility and communication. The full management structure should be publicised as soon as it is available and included in future revisions of the site management plan.

This document broadly plans the management focus for the site for the next ten years, and provides detailed management prescriptions for the next five years, with realistic annual work programmes. All management operations that are relevant to the site's aims are included. As with any medium term planning, small adjustments will need to be made year on year, to help achieve the planned objectives.

This plan and the initial consultations are only part of a longer term process. Changes must be made to enable the various interest groups to work together and the plan to be implemented. In order to help resolve communication difficulties, the management committee has officially opened its meetings to the public, with a standing agenda item for questions relating to the site. These meetings will be more widely publicised in future.

The review committee recommends that there is also a clear, agreed structure for the referral of questions and comments between meetings, (which take place every two months), with one point-of-contact for the public. We also recommend that an annual public meeting is held to review progress towards achieving the planned objectives. This meeting should enable local residents to remain informed and to express their own ideas and views, in what we sincerely hope will be a positive and inclusive forum.

### ***1.1.3 Site Ownership***

The site is owned by the Chiltern Society. The main aims of the Society in relation to all their work are stated on their website, as follows.

We aim to maintain the special qualities of the Chiltern Hills by:

- encouragement of high standards of town and country planning and design;
- raising awareness and understanding of the character and history of the Chilterns;
- encouraging people of all ages to enjoy and care for its natural environment and beauty;
- encouraging conservation, development and improvement of the amenities, areas of tranquillity and features of historic interest in the Chilterns;
- promoting such other charitable purposes as may from time to time be determined.

Registered Charity number 1085163  
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(The Chiltern Society, 2008)

### ***1.1.4 Management structure***

As site owners, the **Chiltern Society** have overall responsibility for site management and are the ultimate budget holders. The management committee is responsible for an operating budget for the watercress centre, which is intended to balance modest revenues against costs. Other finance for managing the site comes from grant funding, or donations, or may come directly from the Chiltern Society. Accounts are administered by the management committee.

The **management committee** consists of representatives from the main stakeholder groups and representatives of special interests such as archaeology and ecology. The committee's overall remit is to manage the site in accordance with the approved management plan, on behalf of the Chiltern Society.

The role of a **site manager** is to co-ordinate all those working on site and be the main channel for communication between the Management Committee and the public. In practice, there may be more than one person responsible for different aspects of site management, but it is important that one individual co-ordinates all activities.

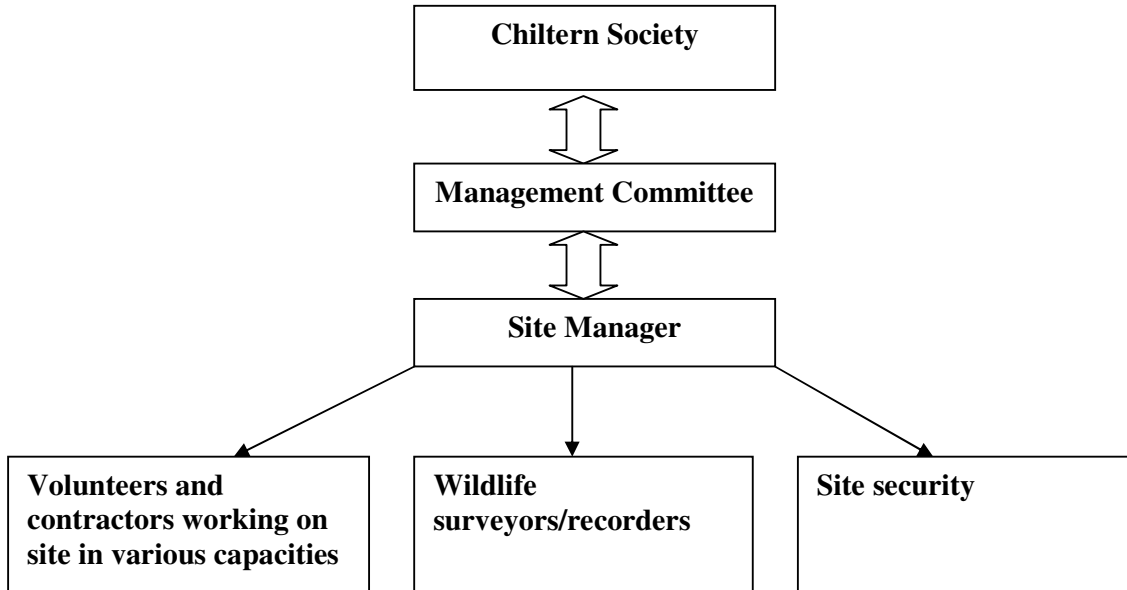
Several groups of **volunteers** are involved in the **management** of the LNR, which includes both the physical management and the provision of information and education. These are Sonning Common and Wallingford Green Gyms, South Chiltern Volunteers, and local residents, many of whom are members of the Friends of Ewelme Watercress Beds. Many volunteers are also members of the Chiltern Society. Some volunteers offer specialist skills, e.g. in drawing up an education pack and accompanying education visits for local schools.

**Wildlife surveyors/recorders** may be local volunteers, or professional consultants brought in for specific surveys (see 'contractors' below).

**Contractors** are employed for specific tasks, e.g. annual mowing, tree work, wildlife or structural survey and maintenance of large structures.

On an open site within a village, **security** needs to be considered.

**Figure 1. Proposed Management Structure**



### ***1.1.5 Consultees/stakeholders***

#### ***Local organizations, individuals and groups with an interest in the site***

- The Friends of Ewelme Watercress Beds
- Ewelme Parish Council
- The Ewelme Society
- Residents of Ewelme village and surrounding area
- Neighbours with property immediately adjacent to the watercress beds
- Members of the Ewelme Watercress Beds Management Committee
- Volunteers

#### ***Statutory consultees/stakeholders***

- Environment Agency (Main River status of chalk stream)
- Natural England (LNR status, protection afforded to water vole and other species on site, Area of Outstanding Natural Beauty [AONB])
- BBOWT (Water Vole Project)
- South Oxfordshire District Council (planning authority and declaring authority for LNR status)
- Oxfordshire County Council (County Archaeologist)
- Chilterns Conservation Board (manages the AONB, and the Chilterns Chalk Streams Project)

*As site owners and sponsors of the management plan review, the Chiltern Society will have final approval, following consultation.*

## **1.2 Site owners' policy/aims and other legislation and protection measures pertinent to the site**

### ***1.2.1 Owners' policy/aims***

Within the Chiltern Society's overall policy for the Chiltern Hills (above), the Society has a particular involvement with the Ewelme Watercress Beds. For these, the Society aims:

- to preserve the archaeological heritage of a localised and traditional industry;
- to conserve and enhance the range of wildlife species and habitats;
- to give due consideration to landscape quality;
- to provide opportunities for education and provide information to the public;
- to provide visitor access and opportunities for public participation;
- to provide opportunities to observe and enjoy wildlife;
- to keep and maintain an historical archive;
- to maintain accurate and accessible records relating to the above; and
- to maximise and encourage harmonious relations with the residents of the village and site neighbours.

(Chiltern Society, 2008)

### ***1.2.2 Policy relating to Site Status***

The site is a Local Nature Reserve, a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act, 1949. Natural England specifies the following:

Local Nature Reserves (LNRs) are for both people and wildlife. They are places with wildlife or geological features that are of special interest locally. They offer people special opportunities to study or learn about nature or simply to enjoy it.

#### ***The Local Nature Reserve agreement between South Oxfordshire District Council and Chiltern Society (January 2003) specifies that***

...the Society will manage the Reserve as a nature reserve within the meaning of Section 15 of the National Parks and Access to the Countryside Act 1949 that is to say for the purposes of:-

- (a) providing under suitable conditions and control special opportunities for the study of and research into matters relating to the fauna and flora of Great Britain and the physical conditions in which they live and for the study of geological and physiological features of special interest in the area
- (b) carrying out at its own expense all obligations and requirements contained in the Management Plan ...or of any Management Plan which may (subject to the prior written approval of the District Council) from time to time replace the said Management Plan
- (c) providing the opportunity for groups of students and school children to use

the Reserve in connection with the purposes described in Clause 1(a) above (such groups to be properly supervised and in such numbers as may be compatible with the achievement of such purposes)

(d) establishing a Management Committee to manage the Reserve

(e) submitting an Annual Report to the District Council as to the management of the Reserve

**National Parks and Access to the Countryside Act, 1949** (designation of Chilterns AONB)

**Countryside and Rights of Way (CROW) Act, 2000** (introduced a statutory duty to prepare a management plan for an AONB, in this case on the Chilterns Conservation Board)

**Planning (Listed Buildings and Conservation Areas) Act, 1990** (imposes constraints on management of most trees within conservation areas)

**Planning Policy Guidance Notes and Planning Policy Statements**, as relevant

### *1.2.3 Other policy relating to wildlife*

**Wildlife and Countryside Act, 1981**, as amended (protected species, e.g. water voles, nesting birds)

**European Habitats Directive, 1992** (protected species, bullhead)

**UN Convention on Biological Diversity, 1992**, and **UK Biodiversity Action Plans, 1994 et seq** (protection of priority habitats and species)

### *1.2.4 Policy relating to people on site*

Health and Safety legislation, in particular **Health and Safety at Work etc Act, 1974**

**Occupiers' Liability Act, 1957**, as amended 1984 (imposes an obligation to ensure that every reasonable care is taken to remove any risk to both visitors and trespassers)

## **2. Site description**

### **2.1 General information**

#### ***2.1.1 Location***

Ewelme Watercress Beds LNR lies between Ordnance Survey Grid Reference SU636920 and SU643915.

The site is situated in the lower part of Ewelme village. It runs roughly parallel to and at times adjacent to the High Street to the south east of the road bridge (Eyre's Lane/Green Lane), and continues, extending beyond the built-up area of the village to the north west, running parallel with Benson Lane.

#### ***2.1.2 Map coverage and site boundaries***

The site is 2.58 Ha in size, according to Natural England LNR designation. Map available from [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk)

Explorer 1:25,000, sheet 171, Chiltern Hills West

Landranger 1:50,000, sheet 175, Reading and Windsor

Landranger 1:50,000, sheet 164, Oxford

Numerous other maps are held under limited licenses from Ordnance Survey, e.g. map relating to County Wildlife Site boundaries held by Thames Valley Environmental Records Centre (TVERC), or maps included in the 2004 management plan.

A number of residential properties to the east of the road bridge have gardens adjoining the site. To the west of the road bridge the site is bordered on its northern side by an area of apparently unused land; further west is pasture belonging to Prospect Farm, which includes a nearby tree-fringed isolated pond. To the south and west there is regularly cut grassland surrounding the runways of RAF Benson.

#### ***2.1.3 Photographic coverage***

Thomas Stevenson (Benson) has a wide-ranging collection of recent photographs of the site, as do many other individuals. There is an archive of historical photographs, but at present there is no central archive to which new photographs are systematically added.

#### ***2.1.4 Site status***

The site is within the Ewelme Conservation Area and, to the east of the road bridge, is within the Chilterns AONB.

It is a designated Local Nature Reserve.

It is registered as an Oxfordshire Wildlife Site, and as such it receives protection through the land use planning system.

The Ewelme Brook has Main River status.

The site won a Chilterns Conservation Board Award in 2005

## **2.2 Physical aspects**

### ***2.2.1 Geology, geomorphology and soils***

Ewelme lies on the Lower Chalk of the upper Cretaceous period (approx 65-99 million years old). The Lower Chalk is overlain by 1<sup>st</sup> Flood Plain Deposits within the Younger River Gravels. The Totternhoe Stone, a layer of hard, fractured and permeable Chalk, within the Lower Chalk, outcrops around the Kings Pool area of the village, probably including much of the site.

### ***2.2.2 Hydrology***

The Kings Pool, to the south east of the site is one source of the Ewelme Brook. This is fed by numerous springs, arising where the permeable Totternhoe stone meets the less permeable, clay-rich chalk marl. Other springs arise along the Brook. There is a major winterbourne spring in the grounds of the Manor, and several springs arise in the base of the watercress beds. Many additional springs arise from land to the south of the beds along the length of the site. These ran at exceptionally high levels during winter 2000/2001 (Chiltern Society, 2004), when there was extensive flooding in the village, extending to the Common and lasting for several months.

A tufa-depositing spring to the north of the old Trout Pond feeds the area of marshy ground (*Glyceria maxima* swamp community S5 (Rodwell, 1995)) found here. This area was originally created as an on-line pond and still retains its connection with the Brook. The springs are fed by groundwater, which, for the most part, has percolated through tens or hundreds of metres of Chalk in the Chiltern Hills to the east. This provides for a steady delivery of water and ensures that the brook flows perennially. Very high- and low-flow conditions are rare, occurring only after prolonged wet or dry periods. The flooding in 2000/01 has been referred to above. The stream has occasionally dried up completely, the most recent occurrence during the drought of 1976, when water was pumped from the aquifer to maintain a level of flow for watercress cultivation.

## **2.3 Biological aspects**

### ***2.3.1 Habitats***

The main wildlife habitats present on the site are the chalk stream, the marshy swamp in the area of the old Trout Pond, the more open pond habitat in the Trout pond spur, 'improved' grassland, and hedge/scrub/trees, with the addition of the new bat hibernaculum. There are also numerous habitat piles (grass, logs and brash) which can be included as part of the grassland habitat, and a number of bird nesting boxes in the hedge/scrub/trees habitat.

### ***2.3.2 Flora***

As might be expected, watercress is the dominant plant across much of the watercress beds. There are numerous other species present, some of which are invasive species

such as great willowherb and reedmace. Others are more desirable components of a chalk stream habitat, such as water crowfoots and water forget-me-not.

Plant surveys were undertaken by TVERC in 2007, and a species list is in preparation. Other plant surveys have taken place across the site over a number of years. It would be useful to compile a centralized archive of such data that can be referred to by site managers and others.

### **2.3.3 Fauna**

The **water vole** is one of the most important species on the site (see evaluation below). There is a long history of habitation, but during the 1990s there were few sightings (Desmond Dix, 2008, personal communication). American mink (*Mustela vison*) were present in 2001/02, but following an eradication programme, voles were spotted again in 2003. There have been sightings in most years since then, but the voles appear to move up and down the Ewelme Brook, depending on factors such as the level of flow (Julia Armstrong, 2008, personal communication). Water vole droppings were spotted opposite the watercress centre by members of the review committee on 3<sup>rd</sup> April 2008. On the same date a water vole was seen feeding underneath the bridge over the old corn mill weir, by Alison Futter of the Environment Agency. This year Desmond Dix has recorded activity in various parts of the site since late March.

The wet areas within the old Trout Pond support an unusually diverse assemblage of **soldier flies**, five of which are “nationally scarce”, as well as several Nationally Notable **hoverflies** and **craneflies**, which together make it of County importance for wetland invertebrates (Gregory, 2006).

Various fish species are seen within the brook, including three-spined stickleback, 10-spine Stickleback (*Pungitius pungitius*) (Smith, 2005), **brown trout** (*Salmo trutta*) (a Biodiversity Action Plan Priority Species since June 2007) and **bullhead** (*Cottus gobio*). The latter is listed on Annex II of the European Habitats Directive (1992), and the conservation of such species requires the designation of Special Areas of Conservation (SAC). The species does not receive additional protection under UK law, and the LNR does not lie within a SAC.

Numerous bird species visit the site. There are various records of red- and amber-listed Birds of Conservation Concern (BoCC) species. These include song thrush, dunnock, grey wagtail, kingfisher, snipe and water rail. Kingfishers regularly visit the site, but have not nested in recent years. A little egret has also visited recently. Mallards and moorhens frequently raise their young here. Tom Stevenson (Benson) has collected weekly records of birds seen on or flying over the site since October 2002. These can be found in detail on <http://www.ewelmewatercressbeds.org>. Other records may be found through TVERC.

The site was briefly surveyed for its dragonfly value on one date during the summer of 2007, as part of a TVERC survey. The surveyor found that the number of dragonflies observed was small (the majority being brown hawkers) and thought that they could all have been wanderers from other places (Walker, unpublished report). However, the number and species of dragonflies recorded can vary greatly depending on the weather and season. There are recent (2006 and 2007) casual sightings for about eight other

species on the site, including broad-bodied chaser, emperor dragonfly and banded demoiselle.

An aquatic invertebrates survey was carried out in the Ewelme Brook by Matt Smith in 2005. Please see notes in section 2.3.4 below.

A number of grass snake records were submitted to TVERC in 2003, and the species, which is protected against killing, injuring and sale under the Wildlife and Countryside Act (1981), as amended, is frequently seen on site.

Bats of unknown species are seen flying over (Beryl Hunt, 2008, personal communication). At the time of writing, a bat roost is being created in an old World War II gun emplacement.

### **2.3.4 Communities**

The most notable community is the assemblage of diptera in the old Trout Pond, as described briefly under fauna in section 2.3.3 above. For more details, see Gregory (2006).

Elsewhere the aquatic invertebrate community has some similarities to natural chalk stream communities, including species such as the mayfly *Ephemerella ignita* and caddis fly *Rhyacophila dorsalis* (Smith, 2005). However, in the 2005 survey by Smith, these were found only in the outfall from the small weirs between the watercress beds, and in the bypass channel. In these areas conditions are more similar to those expected in a natural chalk stream, i.e. faster-flowing water with a higher level of dissolved oxygen than that found in the beds as a whole. The gravel bed found here is also a requirement for these species. Smith noted that “although the water quality of the Ewelme Brook is good, the aquatic habitat within the cress beds themselves is unsuitable for the majority of species that would normally be expected to be found in a small chalk stream” (Smith, 2005).

## **2.4 Cultural aspects**

### **2.4.1 Land use and social history (including industrial archaeology)**

It is likely that the Brook has been used for harvesting watercress for the village since time immemorial. Large-scale production of watercress appears to have begun after the destruction of the Corn Mill by fire in 1886 (Chiltern Soc, 2004). Later that year it seems that the property was bought by Mr George Smith (Legh, 1999). The beds remained the property of the Smith family until 1966 (when they were sold to Mr James Chavasse and Mr Ken Austin) and continued to be used to grow watercress commercially until 1988.

Local residents groups felt strongly that the heritage of the watercress beds should be preserved and that the site should be managed. Local volunteers and the Chiltern Society carried out work on the beds during the 1990s, before the property was put on the market. The Chiltern Society eventually raised the funds required to buy the site and carry out repairs to the beds; the purchase was completed on 29<sup>th</sup> November 2000.

The site has been managed since this date according to the Chiltern Society's main aims for the site, and the policy stated in the 2004 plan. Management activities have concentrated on the restoration and interpretation of the watercress beds, and site maintenance, including management for wildlife. The watercress centre was completed and an education pack developed.

### **2.4.2 Landscape**

Part of the site lies within the Chilterns AONB, designated in large part due to its landscape appeal.

The Natural Areas listed for the LNR on the Natural England Nature on the Map website [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) (2008) are the Chilterns and Thames and Avon Vales Natural Areas. Also listed are the Chilterns and Upper Thames Clay Vales Joint Character Areas.

It also lies on the edge of the Chilterns and the Vale of White Horse Regional Character Areas and appears to fall within the following Oxfordshire Wildlife Landscape Study (OWLS) landscape type (Oxfordshire County Council, 2004).

## **15. TERRACE FARMLAND**

### **Regional Character Areas**

Upper Thames Vale, Vale of Aylesbury, Vale of White Horse and Chilterns.

### **Location**

The landscape type extends over the terraces of the River Thames and its tributaries, covering a large expanse around Wallingford and Dorchester. It also includes the terraces of the River Thame.

### **Overview**

A flat open, intensively farmed landscape overlying river gravel terraces.

### **Key characteristics**

- Broad, flat or low-lying gravel terraces.
- A large-scale, regularly-shaped field pattern of predominantly arable land.
- Localised tree-lined ditches.
- Nucleated villages.

### **Geology and landform**

The area is associated with deposits of terrace sands and gravels to the sides of the Rivers Thames and Thame. Broad expanses of these terraces are on the sides of the lower Thames, around Dorchester, Benson and Wallingford. The landform is flat, low-lying and rising gently above the flat river floodplain.

### **2.4.3 Public interest**

There is a great deal of local interest in the watercress beds site, which is highly visible from many points along the main road.

Local residents rallied support to restore and manage the beds following the end of watercress production, and were instrumental in the eventual purchase of the beds by the Chiltern Society.

Local residents provide regular volunteer labour for the physical management of the Local Nature Reserve, and for educational events on the site.

There is public interest and support from a wider geographical area, as illustrated by the involvement of the South Chilterns Volunteers, and others.

## **2.5 Ecological relationships and implications for management**

Perhaps the most important consideration here is the linear nature of the site and its dependence upon the Ewelme Brook. Management upstream of the site and on adjacent land can affect the quality of habitats and the survival of species on the LNR, either due to water flow or water quality effects. Equally, management actions on site may have effects further downstream.

Some of the important species (see evaluation below) are also dependent on habitats beyond the site's boundaries. For example, this applies to water voles, which may move around the area, particularly in times of low flow in the Brook. At these times they are also more vulnerable to predation by American Mink. A number of operations may require negotiation and agreement with neighbouring landowners, for example, mink control beyond the boundaries of the LNR; control over a larger area is far more effective (Julia Armstrong, personal communication); or working with neighbours to improve management practices for the benefit of wildlife. On occasion the regulation of flow in the Ewelme Brook may require consultation or provision of information to neighbours, particularly where this may affect access or access structures.

Many of the important bird species are dependent upon other habitats or sites for breeding and/or feeding. Sensitive management of this site alone is not sufficient to secure their well-being, but is nevertheless an important consideration. The same is likely to be true for the bullhead fish.

### **3. Site evaluation, including evaluation of features of interest, and facilities to be offered by the site**

This section attempts to define what is important about the LNR, where there are opportunities for improvement, and, in the cases of access and education, what might be realistic levels of provision. In so doing, it begins to draw out some of the factors that may have either positive or negative effects (opportunities and limitations), which are then considered further in the following section.

#### **3.1 The Watercress Beds**

The watercress beds are a distinctive and unusual feature. There are few examples remaining, e.g. those at Letcombe Bassett, or on the Shalbourne Stream near Standen Manor, close to the Wiltshire border. The Ewelme beds are both a relic of a once important local industry, and integral to the character of Ewelme village. It was the Watercress Beds that initially galvanised local public interest in the site, which in turn resulted in its eventual purchase by the Chiltern Society.

Due to the Chiltern Society aims in purchasing the site, there is no intention to use the watercress beds commercially. The value of the beds is therefore as an historic feature of the village and the Chilterns landscape, as an educational resource, and as a habitat for wildlife.

#### **3.2 Other historic features**

The old mill weir

The former trout pond

The gun emplacement, now intended for use as a bat hibernaculum

The pump houses and bore holes

Each of these has a role to play in the interpretation of the site's history and its place within the life of the village.

#### **3.3 The Ewelme Brook**

The Ewelme Brook within the LNR (excluding the Trout Pond) is generally considered to be of relatively low biodiversity when compared to a more natural chalk stream. This is illustrated by an aquatic invertebrate survey (Smith, 2005), and the general dominance of watercress in the aquatic flora. There is also a tendency for other aquatic and marginal plant species to occur in large blocks, rather than in an intimate mixture. (Smith, 2005, and personal observation). This may be as a result of large scale clearance and the resulting uninhibited growth of more vigorous species, although this 'clumping' of species has been observed on other chalk streams (Rod d'Ayala, 2008, personal communication).

The watercress beds have almost certainly had a negative impact on the value of the brook as chalk stream habitat (e.g. for aquatic invertebrates in the main part of the stream). Nevertheless, in different ways it supports the majority of important plants and animals associated with the LNR.

The Brook has the potential to be improved as a chalk stream habitat. As a Biodiversity Action Plan priority habitat, this important potential should be incorporated into the management plan.

Two simple ways of doing this are, firstly, to allow the bypass channel to perform a dual function as an overflow channel for the watercress beds and as a stream that is unimpeded by artificial dams. This should allow for the movement of fish species and provide suitable conditions for aquatic invertebrates. Secondly, to allow elements of the flora of a natural chalk stream, such as the water crowfoot species (*Ranunculus penicillatus* and *Ranunculus fluitans*, according to a TVERC survey in 2007 [David Langston, 2008, personal communication]) to flourish, unless they pose a problem for the management of other features.

The Brook is the feature of the site that most clearly links the LNR with its surrounding landscape.

### **3.4 Water vole (*Arvicola terrestris*) and water vole habitat**

Estimates of numbers, and distribution of water vole activity within the LNR, are difficult to establish without full systematic surveys of the whole site, including the trout pond area. Based on recent survey data for several years up to 2007 (supplied by Desmond Dix), numbers and locations probably vary year on year, depending on water levels and site management. However, there have been consistent sightings in recent years, and there is evidence that several voles may be active in various parts of the site in spring 2008.

As of April 2008 water voles are fully protected under the Wildlife and Countryside Act 1981, as amended.

This is explained in the EXPLANATORY MEMORANDUM TO THE WILDLIFE AND COUNTRYSIDE ACT 1981 (VARIATION OF SCHEDULE 5) (ENGLAND) ORDER 2008, 2008 No. 431, as follows:

**Water Vole (*Arvicola terrestris*)** – will be protected against killing, injuring or taking (section 9(1)); possession or control (section 9(2)); damage or destruction of its places of shelter, or disturbance while such animals are occupying places of shelter (section 9(4)), and sale, possession or transport for the purpose of sale, and advertising the buying or selling of such animals (section 9(5));

Department for Environment, Food and Rural Affairs (2008)

The water vole is a priority species in the UK Biodiversity Action Plan (HM Government 1994 *et seq.*). It is also listed on many Local Biodiversity Action Plans. It is considered to be a Species of Principal Importance for the Conservation of Biodiversity in England under Section 74 of the Countryside and Rights of Way Act 2000.

The site is a BBOWT ‘Local Key Area’ for water voles.

As such, this species and its habitat on site should be considered a high priority within the management plan.

### **3.5 The old Trout Pond and surrounding area**

This part of the site, which includes the *Glyceria maxima* swamp, an ephemeral tufa-depositing stream, steep banks, grassland, scrub and trees, and an open pond habitat in the spur pond, is currently perhaps the most important area for biodiversity on the LNR.

The assemblage of Diptera species (soldier flies, hoverflies and crane flies) is considered to be of at least County importance (Gregory, 2006).

The area of *Typha* (greater reedmace) appears to be expanding, and this needs to be controlled, but not eradicated, to avoid adverse effects on the important Diptera assemblage.

Local ecologists, including the BBOWT Water Vole Project Officer, Julia Armstrong, consider that this may be an important refuge area for water voles, but that systematic surveys need to be carried out over at least three years in order to establish levels of use.

### **3.6 Grassland habitats**

The area of grassland just downstream of the road bridge, in compartment 4, has a number of interesting grassland species, e.g. coltsfoot, amphibious bistort, comfrey and common spotted orchid, and attracts as many as 20 species of butterfly.

In compartment 1, upstream of the Watercress Centre and on the opposite bank, is an area of nutrient rich grassland that was apparently used as a market garden for a period. There is generally little floristic diversity here, with rank grasses and great willowherb mostly dominating the sward. A few more interesting pockets exist, such as two patches of ragged robin, one that sprang up after an old packing shed was removed, and a large patch of meadow vetchling. This suggests that there may be a seed bank of appropriate species in some places, but it is likely that high fertility over much of the area prevents such species from becoming re-established. A central strip running approximately NW to SE between the blackthorn thicket and the eastern boundary of compartment 1, appears to have greater structural and species diversity than the majority of the rest of the grassland (personal observation, spring 2008).

Small areas of generally drier ground have been scraped and seeded in an attempt to diversify the sward. As yet, it is not possible fully to assess the success of these areas. Due to the high fertility (as well as the impracticality of grazing and the difficulty of completely removing cut hay from the site) it seems unlikely that a traditional 'meadow' habitat could easily be introduced across compartment 1.

However, the grassland habitat and its biodiversity could be improved by creating greater structural diversity. That is, by regularly mowing paths, but allowing areas adjacent to the stream bank to grow tall, as refuge for water voles, and continuing to cut other areas annually in late August/September. Continuing to try to diversify small areas within the grassland (following assessment of success of previous methods) and planting small additional areas of scrub, would also contribute to the mosaic of habitats available, as could the creation of one or more small ponds.

Several springs emerge on the lower areas close to the brook, and elsewhere when the water table is high. The ground can be quite wet at times, and the location of these wetland patches is variable depending upon rainfall and the height of the water table. It

is not thought that any special wetland plant or animal communities have developed in these areas, due to their ephemeral nature, but this has not been thoroughly investigated to date.

With careful survey and planning, the creation of one or more small ponds could potentially complement the existing wet grassland habitats and increase the diversity of the grassland as a whole, by benefiting a range of species including butterflies, dragonflies, birds, amphibians and reptiles. However, such a project would require a feasibility study, to include intensive investigation of very localised conditions. This would be a project to reconsider once other management practices are well-established. A feasibility study is included in the management projects below.

### **3.7 Hedgerows/scrub/trees**

Hedgerows are singled out as an important habitat in the Chilterns AONB and are a Biodiversity Action Plan priority habitat.

Hedgerows and scrub help to support many species on site, including butterflies and birds. For many bird species they provide opportunities for feeding and nesting, as well as places to take cover, and corridors for moving around. They also offer perches for singing, particularly in hedges with variations of height and standard trees, such as those on the southern boundaries of compartments 1, 4 and 5. Bat species often use hedges as flight lines, and it is likely that other small mammals use the hedgerows for cover and feeding.

Trees are important for many bird species for feeding or nesting, and they provide perches for singing and calling. These activities are an integral part of successful breeding.

Trees also provide essential shade for the soldier fly habitat in the old trout pond, as well as supporting numerous invertebrates that live or feed on or in them.

Veteran trees can be particularly valuable for invertebrates. There are a few very large hawthorns in the thicket adjacent to the southern boundary hedge in compartment 1.

### **3.8 Other wildlife species**

Other species and groups of species have been recorded with a degree of consistency over several years. For example, there are numerous Birds of Conservation Concern that use the site, and the bullhead, which is listed on Annex II of the European Habitats Directive (1992). Foxes, dragonflies, butterflies, reptiles and amphibians are all recorded, and bats are known to use the site for feeding. Many of these species receive a degree of protection under UK or European law. Best practice should always be followed with regard to nesting birds, and if any protected species are encountered during site management.

However, it is impractical to include planning for any of these species or groups in this plan. In some cases this is partly due to a lack of information. For the most part it is due to their dependence on other sites and on factors that cannot be controlled. As a result,

many species will use the site in some years and not others, regardless of the site's management.

Nevertheless, management to favour such species when they are present (or to encourage them to use the site) can be built in to other objectives.

Future reviews of the management plan should reconsider the case for including other species, as appropriate. For example, it may become important to include bats and their habitat, depending upon use of the hibernaculum, or identification of other roosts. Another example would be the bullhead, which is commonly found in canalised ditches and other sub-optimal aquatic habitats in Oxfordshire, e.g. at Abbey Fishponds in Abingdon (Rod d'Ayala, personal communication). Should the status of this species change, it may become necessary to incorporate a specific objective.

### **3.9 Education and interpretation/information**

The development of an education pack based on the National Curriculum, and visits by local primary schools and Oxford University students demonstrate the usefulness of the site for formal education at various levels. Feedback from a visit by children from RAF Benson was very positive, and the teacher was keen to bring children to visit the site again. There has also been informal positive feedback from students studying for the Diploma in Environmental Conservation at Oxford University. Two cohorts of students from this course have visited the site on field trips relating to wetland habitats.

The watercress centre provides an ideal venue in which small educational groups can gather. It also provides an excellent facility for giving illustrated talks, as well as the demonstration and interpretation of artefacts relating to watercress production on the site, as part of an informal education programme.

Transport costs, the small size of the site and the type of facilities available, issues relating to parking close to the centre and in the village as a whole, as well as the reliance on volunteer labour, mean that the LNR is not suitable to become a major educational destination.

As a result small-scale, high quality education and information provision is both realistic and desirable.

The western end of the site (compartments 4 and 5), the small grassy area adjacent to the watercress centre, and the short section of path adjacent to the High Street (compartment 2) are open to the public at any time. This means that some low-key *in situ* interpretation will be very useful to visitors in these areas.

### **3.10 Public access**

The western part of the site, outside the built-up area of the village, (compartments 4 and 5) is ideal for allowing full public access on permissive paths. There are no residential neighbours to be disturbed, and provided anti-social use does not cause a problem, public access may be beneficial to some wildlife (see section 4.2 below), whilst causing only temporary disturbance to other species. However, it would be

sensible to allow the flexibility to temporarily close this section of the site should there be a possibility of ground nesting birds being disturbed.

The small section of permissive path that runs parallel to the road downstream of the Watercress Centre (compartment 2) can allow for both enjoyment of the site, and a safer route than walking along the road. The public are currently free to use the bench and grassy area in front, and there is no reason at the present time why this should change.

The area upstream of the Watercress Centre has been judged more suitable for restricted access, due to the proximity of neighbours across the brook, and there is no reason to change this.

There is no requirement to provide public access in compartment 3 (between the ford and the road bridge). Access in this area should only be for parties working under the auspices of the Chiltern Society, for the purposes of site management or monitoring projects. Access for these purposes may be through a gate from Green Lane or through the beds. It does not require the establishment of a permanent path.

Security is an issue for any site offering public access, and on this site this is particularly important in areas in which there is the potential for unauthorised access to neighbouring properties. This limits the levels and locations of public permissive access (as above) as well as putting an onus on the site's owners to ensure that the provision of access at any level does not pose an increased security issue for neighbours. Copies of the site rules of behaviour for visitors should be clearly displayed.

### **3.11 Public participation and the relationship with village residents and site neighbours**

There are numerous opportunities and requirements for public participation at the site, and a long history of this taking place. In recent years, numbers of willing volunteers, e.g. for the work days, have dwindled, but there is a core of committed volunteers who provide both general and specialized assistance. It is essential to the future success of this site that public participation and local goodwill are regarded as high priorities.

#### **4. Consideration of factors affecting the features of interest, facilities to be offered, and the site as a whole**

This section considers numerous factors affecting the features and facilities of the LNR. Many of these opportunities and limitations have been identified during the consultation process. It is through consideration of the effects of these various factors that objectives, management and monitoring that are appropriate to the site can be formulated. The objectives and the management and monitoring projects for the site appear below, in section 5 and section 7 respectively.

##### **4.1 The watercress beds, other historic features, and the Ewelme Brook**

There is a need for compromise in balancing the importance of the industrial heritage of the watercress beds and the chalk stream habitat of the Ewelme Brook. Effectively each of these represents a negative factor for the other.

Extreme clearance of natural chalk stream vegetation and continual manipulation of flow could destroy many of the remaining aspects of a chalk stream habitat and eradicate from the site some of the species associated with this habitat. Conversely, a failure to maintain flow and adequately to control water levels, could result in damage to the watercress bed structures.

Watercress and species such as great willowherb could choke the bypass channel and impair its function if allowed to grow unchecked. These should therefore be removed periodically. (Wholesale removal will reduce diversity, rather than encourage it, Allen Beechey, personal communication). However, water crowfoot should be allowed to remain, unless it is clearly posing a problem by choking the bypass channel and restricting flow.

The same applies to the practice of clearing channels through the watercress beds. The choking growth of watercress requires channels to be cleared in order for flow to be maintained throughout the year.

Removal of vegetation and control of water levels must be sensitive to the needs of water voles and the legal requirement not to disturb them (see below). Water voles prefer well-vegetated banks, and plenty of marginal vegetation. Therefore clearance of channels within the beds must avoid the removal of marginal vegetation. The traditional management is to clear side channels, and this could continue to be done, with care, in a limited number of demonstration beds. In other beds, the current advice from our wildlife consultees is to clear a central channel instead. Other channels could be cleared if one central channel proves inadequate to maintain flow.

At times it may be necessary to divert excess water away from the beds and down the bypass channel, in order to avoid damage to bed structures. It may be necessary to liaise with neighbours at such times, in order to minimise potential disruption caused by obstruction of access over the ford, or other unforeseen effects.

There are some non-native species, in the watercress beds, such as monkey flower (*Mimulus guttatus*), but the site is fortunate that at present it does not suffer from some

of the more invasive non-native species of riverine habitats, such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), or giant hogweed (*Heracleum mantegazzianum*). There has been at least one invasion by American mink, but signal and other non-native crayfish are as yet unrecorded. Detailed guidance on how to deal with each of these species is available from various sources. This should be followed as soon as there is any sighting, in order to prevent the species propagating beyond controllable levels.

There are two dams in the original watercress bed restoration plans that have not been re-instated in compartment 3. One of these dams would almost certainly have the effect of raising water levels across one neighbouring property's only access route, and another is within approximately one metre of an existing dam. Although the dams are considered to have served a purpose at the time of commercial production, they were not re-instated when the rest of the restoration work was carried out on the beds.

Although not unanimous, recent consultation indicates that there is a general acceptance that the watercress beds have been restored to an extent sufficient to allow their purpose and historical value to be appreciated by the general public. There is also no clear evidence that the function of the beds is impaired without these structures. Under these circumstances, and given the potential impact on water voles and their habitat (see section 4.2 below), proceeding with the restoration of these dams is inadvisable.

Factors affecting the other historic features (the old mill weir, gun emplacement, pump houses, bore holes) are largely those relating to weathering and age. This means there is a requirement for regular inspection, and maintenance as required.

## **4.2 Water voles and water vole habitat**

### **Current factors causing loss or decline of water voles (UK Biodiversity Action Plan)**

Loss and fragmentation of habitats.

Disturbance of riparian habitats.

Predation by mink.

Pollution of watercourses and poisoning by rodenticides.

Water voles are now fully protected under the Wildlife and Countryside Act 1981, as amended. Most relevantly they are protected against killing, injuring or taking; possession or control; damage or destruction of places of shelter, or disturbance while occupying places of shelter. This is clearly a good thing from the point of view of a water vole. It does however have consequences for many aspects of site management.

Water voles require vegetation in which to hide, and it is important that deep fringes (approximately 5m on average) of tall vegetation are retained on bank edges wherever possible. Cutting removes habitat and so should only be done on rotation, in small sections of approximately 30-50m, although shorter sections could be cut if appropriate (e.g. to avoid cutting close to areas of known high activity).

In some areas shading or other factors keep growth in check, and suitable habitat can be maintained without the need for intensive management. For example, in compartment 2, the southern bank below Nellie Bridge requires little/no management where heavily

shaded. The southern bank of compartments 4 and 5 and all banks downstream of the old mill weir can be left unmanaged.

Water voles are also subject to factors that may be beyond the control of site managers, e.g. drought, or may need to be controlled beyond site boundaries, e.g. American mink. Low water levels can be ameliorated to a certain extent, and may be less of an issue provided mink are not present (water voles like to exit their burrows into water in order to escape predators). Mink trapping on site may be effective against low numbers of mink (and has apparently been effective in the past), but as the efficacy of trapping in controlling populations is not proven (Tyler, C., Clark, E. and Pullin, A. S., 2005), a larger-scale programme of surveillance involving other landowners could give a better line of defence, and perhaps prevent mink from reaching the site.

There is evidence that mink rafts can be very effective. At a site in Norfolk, the success mink rafts in terms of detection, trapping effectiveness, conservation of resources and ease of use led to a further 20 being deployed in adjacent areas. (Thompson H., 2006)

The restoration or repair of hard structures relating to the production of watercress (or the building of any hard structure in the water) is potentially a negative factor for water voles. Heavy duty repair work will require careful consideration and prior survey for presence of the voles. Under guidance relating to the Wildlife and Countryside Act, work should not be carried out if disturbance to water voles cannot be avoided. As there is no clear need to replace the two dams that were not reinstated when the other major construction work took place on site, best practice would dictate that this work should not now be undertaken in an area used by water voles.

Numbers and distribution of water voles using the LNR are difficult to establish without full systematic surveys of the whole site, including the Trout Pond area. A lack of knowledge could be a negative factor, either because it results in areas being managed in a way that is insensitive to water voles, or because unnecessary restrictions are imposed on management in areas not used by the species.

It is fairly generally accepted that water voles are tolerant of pedestrians and dog walkers, as long as they have plenty of vegetation cover in which to hide. Equally, it is a legal requirement to ensure that dogs are kept under control and are not allowed to disturb water voles in such places of shelter.

### **4.3 Trout pond and associated species**

One negative factor here is a lack of knowledge of the ecology and exact habitat preferences of some of the species of diptera that make this area of County importance. However, the requirements of the soldierflies and hoverflies are reasonably well-known. There is a variety of moisture levels present in different parts of this wet area, that would favour species requiring oxygen-rich surface film, amphibious or aquatic conditions for their larvae. The presence of tufa also favours some species, and the vegetation provides a number of different niches. It seems that the trout pond offers optimal conditions to favour a broad suite of species (Steve Gregory, personal communication, Stubbs and Falk, 2002).

This allows the assumption to be made that the current conditions are optimal for the assemblage of species concerned, and that managing for a continuation of similar conditions will result in the continued presence of these species.

One difficulty is that these species are difficult to survey effectively, except by destructive sampling (i.e. specimens are killed by the survey method and many non-target taxa are killed too). As a result the presence of the species should be checked only infrequently, in order to reduce the potential for damage as a result of removing individuals from populations. This is particularly important as the site is so small and there is little or no other habitat nearby that is known to be suitable for species with such a narrow range of preferences.

It is possible that reedmace (*Typha latifolia*) may continue to expand and eventually reduce the amount of standing water. This would change the habitat and could have a negative effect on the assemblage of diptera species. It is recommended (Gregory, 2006) that small patches are dug out to ensure a continuation of standing water. However, the rate of expansion of the reedmace in this location is currently unknown and it is sensible to set a tolerance limit for the proportion of the area that it is allowed to cover. This can be set at approximately 25% cover (Steve Gregory, personal communication). There is then a need to monitor its extent annually, and consider more extensive removal if this limit is exceeded.

It is important to note that water vole are likely to use and possibly nest in this area. Reedmace should only be dug out of areas where it has been established by formal survey that there is no evidence that any area to be affected by the operation (i.e. points of access, etc, as well as the actual area to be dug) is currently being used by water vole.

#### **4.4 Grassland habitats**

The grassland in compartment 1, opposite and upstream of the watercress centre is generally dominated by rank grasses and weeds such as great willowherb. The latter is particularly rampant in spring 2008 in the area of the old packing shed, perhaps due to a very wet season.

It is possible that attempts to diversify small areas may have had some success, but this has yet to be ascertained. Surveys will need to be carried out to check establishment against a list of species sown.

One problem is that fertility appears to be very high, as evidenced by rapid growth of rank species (although the soil has not been tested) and gaps may tend to be colonised more successfully by the less desirable species, rather than those that have been deliberately introduced.

It is a very long and sometimes difficult process to reduce fertility in grasslands. This is particularly the case where grass/hay that is cut from the site is not completely removed. In the longer term, retaining cut grass for composting, albeit in discrete piles, increases the likelihood that some nutrients will be leached back into the grassland by the action of rain, and water in the soil.

The habitat requirements of water voles dictate that wide strips of taller vegetation should be allowed to develop along the banks of the brook, wherever possible. This may present a problem in terms of the more invasive species such as great willowherb. Control of individual species by hand pulling or topping prior to seed set (as appropriate) is likely to be necessary.

At present this grassland is cut annually in late summer or autumn using agricultural machinery that is brought in across Ewelme Trust land, at the eastern end of the site. A continuation of cordial relations and communication with these neighbours will be necessary if this practice is to continue for the majority of the area, excluding the bands of taller vegetation adjacent to the bank.

Depending on where they are sited, the introduction of patches of scrub or ponds to this area could make the use of large-scale machinery more difficult, so the means by which the grass is cut will need to be considered as a factor in any projects to diversify the structure of the grassland. For the next five years, scrub should only be introduced in areas adjacent to existing hedgerow or scrub, in order that cutting can continue as previously.

The need for detailed hydrological survey prior to construction of any ponds in compartment 1 would also tend make this a lower priority, to be considered once other management practices are well-established.

The grassland in compartment 4 can be accessed from the road for the purposes of cutting.

#### **4.5 Hedgerows/scrub/trees**

The main factors affecting hedgerows, patches of scrub and trees relate to natural growth and ageing. For some there are additional factors, such as their proximity to pedestrian access ways, other boundary features, or neighbouring land.

As a result, it is necessary to manage all hedgerows and areas of scrub on site, and may be necessary to carry out management on some of the trees.

Some of the hedgerows on site are close to paths and roads, and will need to be managed mainly by cutting, in order to avoid obstruction. It may also be possible to lay some parts of these hedgerows.

Other hedges, particularly the hedge on the southern boundary of compartment 1, can be managed by laying. This helps to provide an impenetrable barrier, and should help to increase the wildlife value of the hedge over time. It should also be possible to lay and/or coppice sections of the blackthorn thicket in this compartment, to prevent it becoming unstable and causing a potential hazard to the public, and to provide a more varied age structure.

Some tree species benefit from pollarding or coppicing. This may prolong their life and also protect the public, by reducing the likelihood of trees splitting and falling. This applies particularly to crack willows on site, but will also occasionally apply to other

species. A regime of regular inspections of all trees (including those within hedges) will enable a programme of works to be drawn up on the basis of an expert report.

In certain circumstances trees may need to be de-limbed, or be removed completely, for safety reasons. This may be as a result of natural ageing, or disease.

As described above hedges and trees provide habitat for numerous species. It is important that hedge and tree works are scheduled to avoid the bird nesting season and that due care is taken in checking for signs of roosting bats prior to work on trees. Nest boxes must either be maintained according to best practice, or removed when not in use.

#### **4.6 Education and interpretation/information**

Appropriate opportunities for education, research and/or informal enjoyment of wildlife are integral to the designation of Local Nature Reserves. The Chiltern Society policy for the site also includes the provision of educational opportunities and interpretation facilities.

The willingness and availability of a volunteer/specialist consultant, who has already written an education pack and is willing lead school visits as a volunteer, is a very positive factor. Likewise the willingness of other volunteers to engage with education activities.

At the same time, the reliance upon volunteer labour potentially imposes limitations on the extent of the education programme.

The watercress centre is well-equipped for small groups of all ages.

The site is relatively small and does not offer playground or other facilities that are offered by other educational destinations. This will limit its appeal and may discourage schools or the general public from travelling long distances. Transport costs may be prohibitive even for relatively local schools.

There is little space suitable for parking adjacent to the Watercress Centre and it is important that the scale and planning of events and programmes takes this into consideration. The education programme must not significantly increase the existing problems of parking congestion within the village.

The management committee has already commissioned two new interpretation boards to be placed at the western end. The boards are to be in compartment 5, one to the west of the trout pond and one inside the boundary fence below the mill weir and visible from Benson Road. There will also be a replacement notice board/interpretation board to be placed close to the position of the current board (and replacing it) outside the watercress centre.

When installing these boards consideration must be given to the appearance of the site (landscape), as well as any legal issues such as planning permission and/or the presence of water vole burrows.

#### **4.7 Public access**

Appropriate levels of public access are integral to the designation of Local Nature Reserves in general, and the Chiltern Society policy for this site.

There are a number of considerations in the provision of public access on any site. Negative factors can include possible hazards to the public and the need for adequate public liability insurance, as well as other potential negative consequences of providing access. There is also a need adequately to maintain boundary and access structures.

For this site the potential negative consequences of providing access include causing disturbance to wildlife and to neighbouring landholders.

There is a clear need to balance the Chiltern Society (and LNR) aim of providing access for enjoyment of the site and its wildlife, and any negative consequences for wildlife. Most species present on a site will either be undisturbed by low levels of public access, or may be temporarily disturbed, then return.

The legislation relating to water voles requires that they are not disturbed whilst in places of shelter. This is something that should be considered by leaders of guided walks and open days, as well as unaccompanied individuals, who are subject to the same legislation. It must also be considered in relation to the possible short extension of the path that runs parallel to the road downstream of the Watercress Centre (compartment 2).

It has been suggested that it would be useful to extend this path to a point just upstream of the ford. However, the bank here is currently insufficient to provide a safe path, partly due to the presence of several large trees. Any project to extend this path could be a major undertaking, requiring a survey of the bank, an intensive water vole survey and full structural plans to be submitted to the Environment Agency. There would be a requirement that water voles were not unnecessarily disturbed, and that the extent of vegetated earth bank was not diminished. Planning permission may be required, and there may be a number of costs involved. However, there are volunteers who have many of the design and constructional skills required. Bearing in mind all these factors the management committee will need to make a decision as to whether it is feasible or appropriate to pursue the path extension.

Provided anti-social use does not become a problem, public access may be beneficial to some wildlife. See notes on water voles in 4.2 above.

There is also a need to balance public access with the privacy and security of neighbours to the site. This is particularly relevant in compartments 1, 2 and 3, where neighbours' gardens and land adjoin Chiltern Society land ownership. Measures must be taken to ensure that the provision of access to the site does not disadvantage neighbours. In particular the installation of a gate part-way across Nellie Bridge will prevent unauthorised access far more effectively than a chain link fence.

Neighbours' gardens adjoin or extend to the bank opposite compartment 1, but opportunities for overlooking these can be reduced as a by-product of moving paths away from the bank edge wherever possible in order to meet best practice for management of site with water voles. Following the newly established circular route

that takes visitors around the back of the blackthorn thicket, will allow them to see all the historic features of this part of the site, and reduce the amount of time spent opposite the neighbours' gardens. Compartment 1 is therefore suitable for restricted access across the Nellie bridge.

In compartment 2, public permissive access is restricted to the northern bank. Access to the southern bank should be restricted to that for the purposes of management and monitoring, in agreement with the landowner, whose land adjoins the Chiltern Society ownership.

Access to the area between the ford and the road bridge (compartment 3), is limited by the lack of a dry route, although there is a gate at the western end. Use of the bank by water voles would make the re-instatement of a permanent mown path an insensitive (and potentially illegal) activity. There are also concerns from neighbouring landholders regarding boundaries and security. This combination of factors should preclude the re-instatement of a path in this location. Access should be limited to that needed for management of the Chiltern Society landholding. This does not require a permanent path.

In addition to the maintenance of hedges (4.5 above) there is a requirement to maintain the boundary fence to the south of compartment 1 (Chiltern Society, 2004). As there is a neighbouring landowner, this should continue to be done by agreement with him, as appropriate.

Concern for public safety (and site security) require that all access points and boundaries should be well maintained. There may be a need for more gated access, e.g. by the old mill weir.

The possible presence of breeding ground-nesting birds may make it necessary to restrict access to certain parts of the site at appropriate times. This may apply in compartments 4 and 5, which is otherwise suitable for open permissive access.

#### **4.8 Public participation and the relationship with village residents and site neighbours**

Long-standing and increasingly complex communication failures appear to have resulted in a reduction in participation by local residents. This is a negative factor.

Improved communication and an ethos of working in partnership with neighbours and the village will be positive factors in encouraging public participation and helping to secure the future of the site.

The site's location at the heart of the village can be a negative factor when things go wrong, but should generally be considered to be positive, as the LNR can be a source of enjoyment and pride for many local residents.

Other positive factors include the number of local residents who take an interest in the site, the willingness of neighbours to become re-involved, and the established groups of volunteers and individuals who already participate on a regular or occasional basis.

Prepared by Sarah Coulson-Phillips under the guidance of the Management Plan Review Committee, on Behalf of the Chiltern Society

These people contribute time, labour and specialist skills that would be lacking, or would have to be brought in at considerable cost, without their participation.

## 5. Management objectives

The objectives have been formulated in the context of the Chiltern Society policy and aims relating to the site, other requirements due to legislation, the objectives of the preceding management plan (Chiltern Society, 2004) and the evaluation of the features and facilities of the site. The effects (either opportunities or limitations) caused by the various factors have also been considered, as well as any potential impacts upon the village.

To optimise the historical, ecological and landscape interest of the Ewelme Brook within the LNR.

Where:

- o Historical structures in and adjacent to the water are maintained to allow their purpose and historical value to be appreciated by the visiting public;
- o Watercress is visible in a number of demonstration beds each year;
- o Flow is maintained to the satisfaction of the Environment Agency;
- o All other ecological objectives in this plan can be met;
- o Changes in management to improve the value of this section of the Brook as a chalk stream habitat are implemented, provided this does not significantly impact on other features.

To maintain or increase the available habitat for water voles.

Where:

- o the extent of banks suitable for burrowing is not less than at present in all parts of the site;
- o the southern bank upstream of Nellie Bridge in Compartment 1 retains tall bank-side vegetation to an average depth of at least 5m from the bank between March and September, and at least 50% of this is retained to a height over 50cm over winter;
- o the vegetation on the earth bund is not cut below 30cm in height;
- o where possible, by agreement with the neighbouring landowner, at least 50% of vegetation on the southern bank in Compartment 2 is allowed to grow and remain above 50 cm in winter;
- o the southern bank in Compartment 3 retains tall bank-side vegetation between March and September, and at least 50% of this is retained to a height over 50cm over winter;
- o where possible, the southern bank in compartment 4 and all banks in compartment 5 are left unmanaged;
- o banks associated with the trout pond are left unmanaged;
- o no more than 50% of vegetation in these areas and on either side of the bypass channel is cut back at any one time, and cut sections do not exceed 50m length;
- o where possible, undesirable weeds are controlled by hand before they set seed;
- o bank-side vegetation is not cut below 10cm in height in summer or 15cm from September;
- o there is an on-going programme of control for American mink, using a mink raft, and live traps when needed.

### To optimise the ecological value of the trout pond and surrounding area.

#### Where:

- o Aquatic and terrestrial habitat is maintained to be suitable for the soldier fly/hoverfly assemblage and for water voles to use as a refuge, particularly in times of low-flow in the Ewelme Brook;
- o The value for other aquatic invertebrates is established, and management adapted if necessary, particularly in the area of the Trout pond extension;
- o Surrounding trees are not cut, except where appropriate to species or in case of a safety issue, and further planting of appropriate tree species is considered;
- o Access paths for visitors are regularly cut, but marginal vegetation is left uncut, or if necessary cut in short sections (approx 30m) on rotation, above 10cm in height;
- o Cut material is stacked on designated piles at least 5m away from banks so that marginal vegetation is not inhibited;

### To maintain or improve the wildlife value of the grassland areas.

#### Where:

- o the grassland areas in compartment 4 are cut annually;
- o in compartment 1 the main grassland area is managed by an annual hay cut, an average of 5m from the bank edge is managed as tall bank-side vegetation, areas on the southern slope are managed for tall grass and scrub, and sinuous paths are regularly mown;
- o the feasibility of creating ponds is carefully evaluated;
- o the success of re-seeded and plug-planted areas is evaluated for three years, against a list of species sown and planted, before further diversification is attempted.

### To optimise the ecological value of hedges, scrub and trees.

#### Where:

- o a variety of hedges are maintained, with differing heights and depths, incorporating standard trees where possible;
- o any new planting comprises native species, including berry-bearing species;
- o management is planned to avoid disturbance to nesting birds or bats;
- o trees are managed to increase longevity and retain dead wood habitat where site safety allows;
- o bird boxes are maintained appropriately.

### To provide educational opportunities and interpretational facilities, in keeping with the resources available to the site, and its location.

#### Where:

- o a programme of regular guided walks, open days and talks are offered to volunteer helpers and members of the public;
- o a small number of local schools are encouraged to bring pupils on an annual basis as part of their National Curriculum studies, or for project work;
- o the Watercress Centre is available to other groups (e.g. University groups, wildlife groups, local youth groups) who wish to learn about the site;
- o the Watercress Centre building is maintained to an appropriate standard;
- o all publicity for public events encourages visitors to park in the village car park.

To provide open (permissive) public access on paths and open grass areas in compartments 2, 4 and 5; and to provide supervised public access in compartment 1.

Where:

- o paths are regularly mown;
- o there is an effective barrier to unsupervised access upstream of Nellie Bridge;
- o there are regular safety checks, and appropriate action is taken if hazards are identified;
- o access and boundary structures are maintained to an appropriate standard;
- o adequate public liability insurance is held at all times.

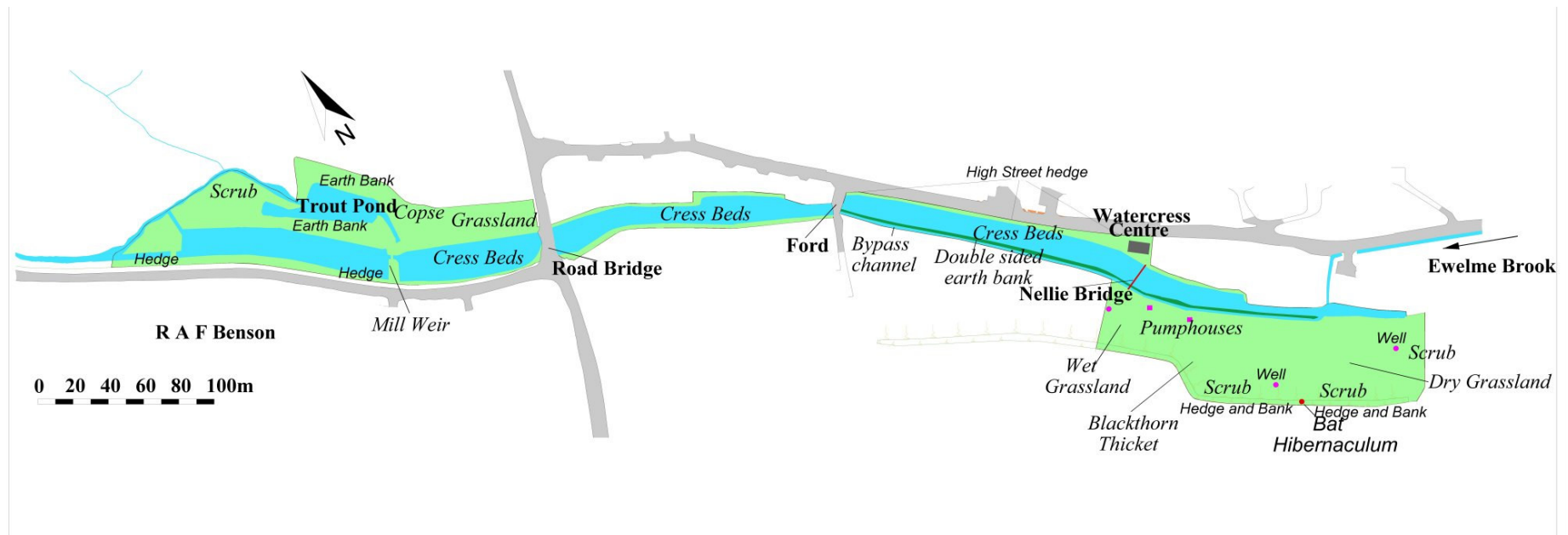
To encourage public participation and harmonious relations with local residents and site neighbours.

Where:

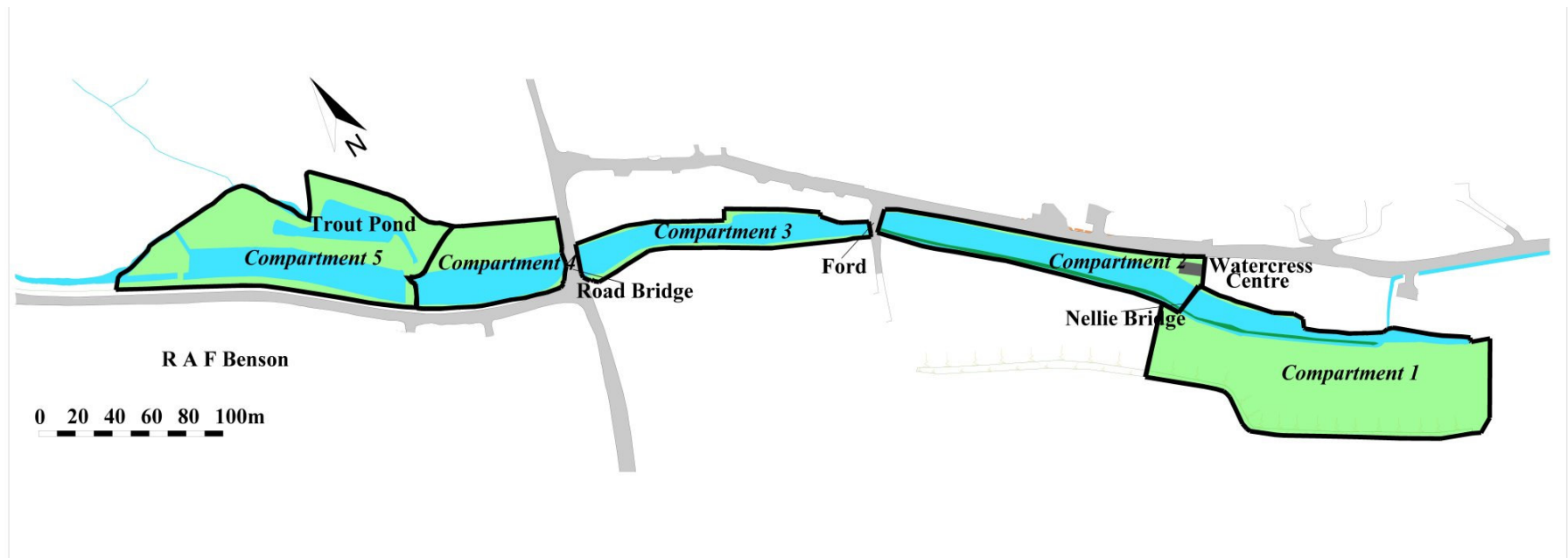
- o workdays, open days and communication events are widely advertised in advance;
- o workday tasks are advertised in advance, on the notice board and website;
- o neighbours are forewarned of events taking place on site;
- o neighbours are encouraged to work with the Chiltern Society to an agreed workplan, to achieve the management plan objectives;
- o there is an agreed structure for the referral of questions and comments to the management committee;
- o there is an annual review of progress towards achieving the objectives, and consultation on any new major projects.

## 6. Site plans

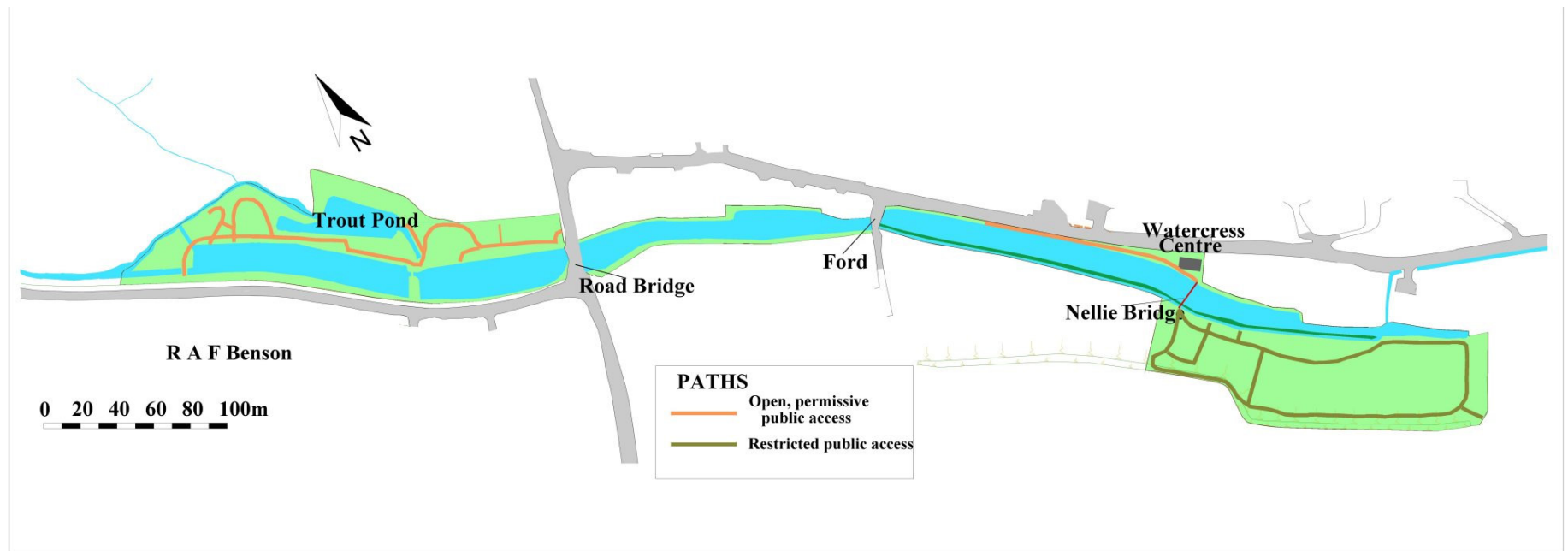
### Plan 1: Site overview, showing areas of different wildlife habitat



**Plan 2: Site overview, showing numbered compartments**



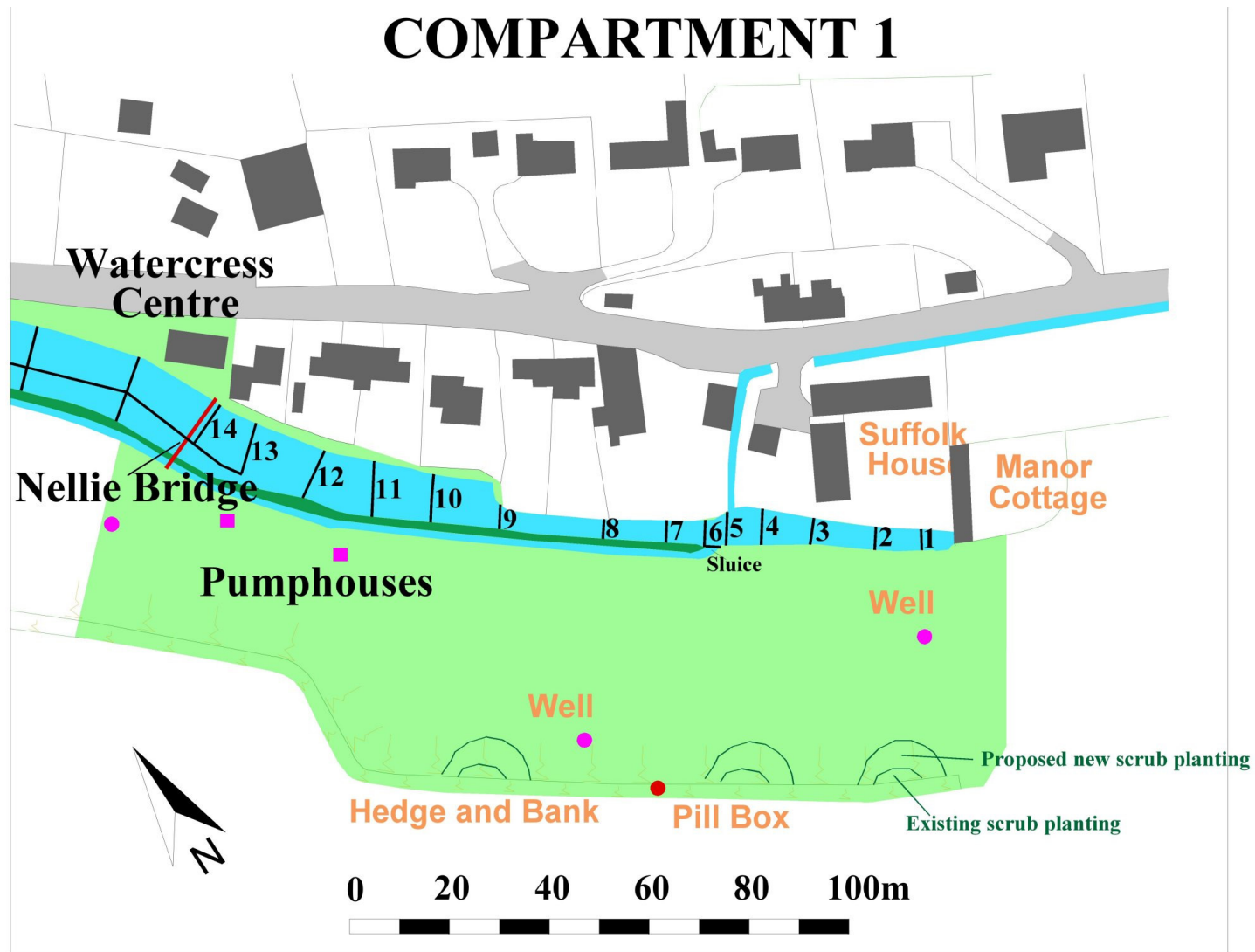
**Plan 3: Site overview, showing areas of open, permissive public access and areas where public access is restricted to open days, guided walks and other accompanied educational events**

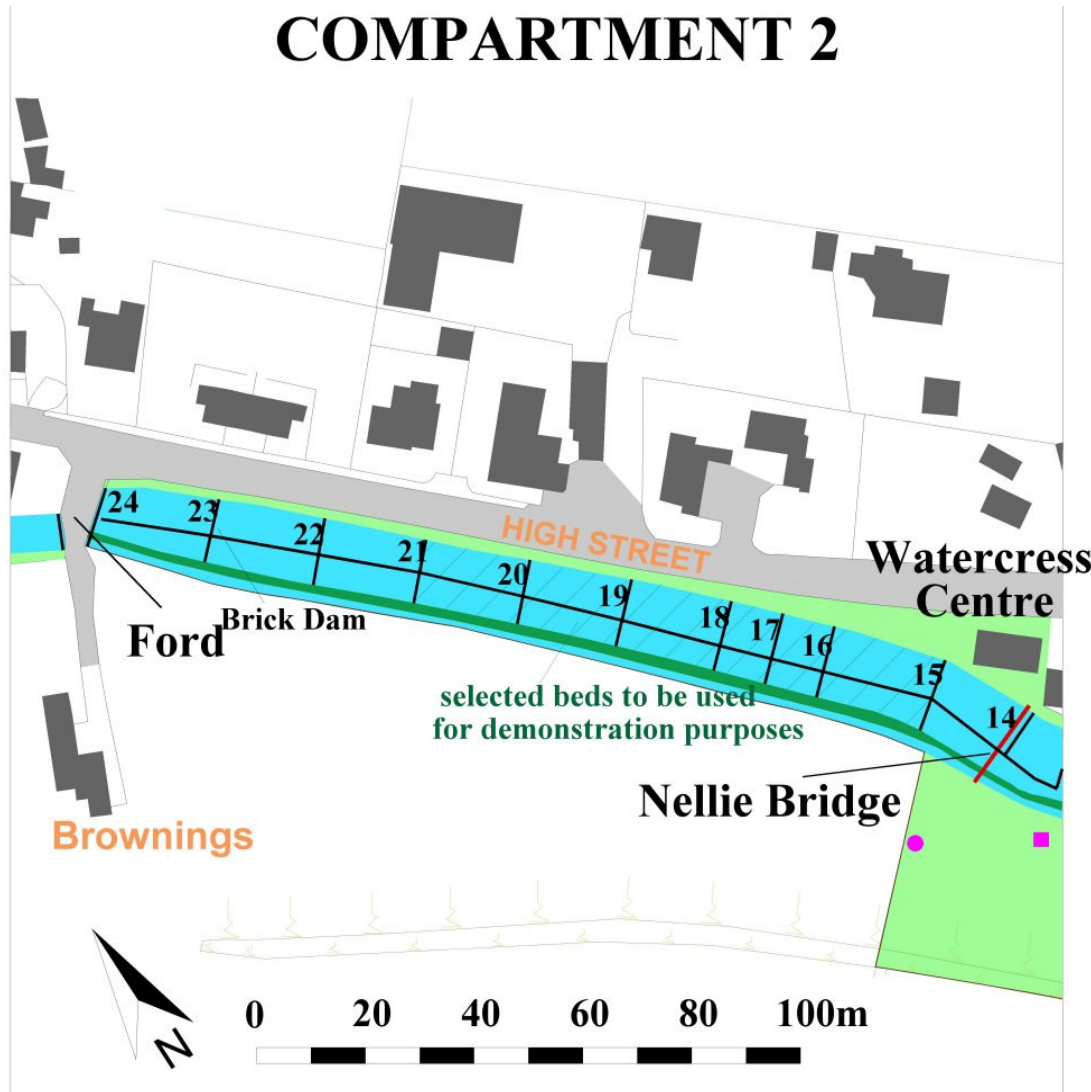


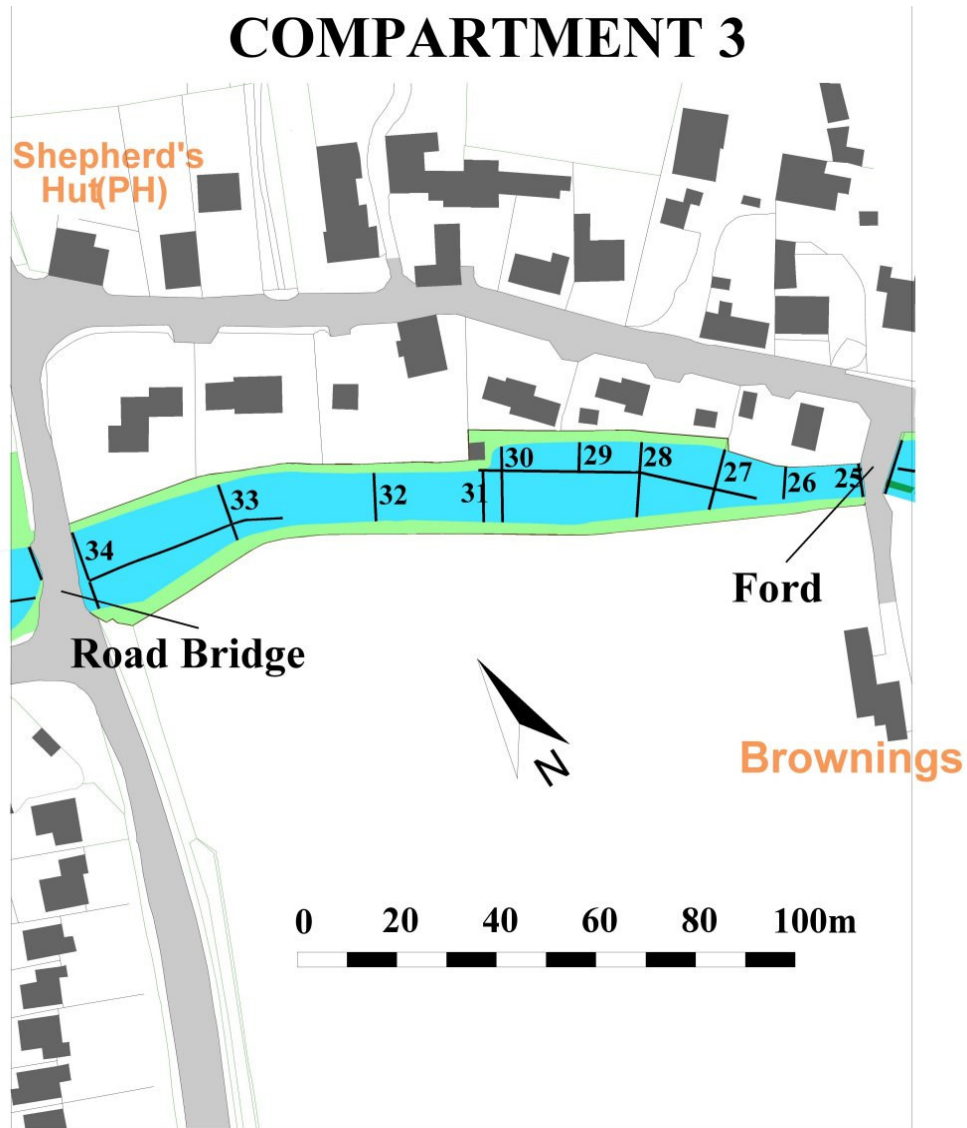
### **Plans 4 – 8: enlarged compartment maps**

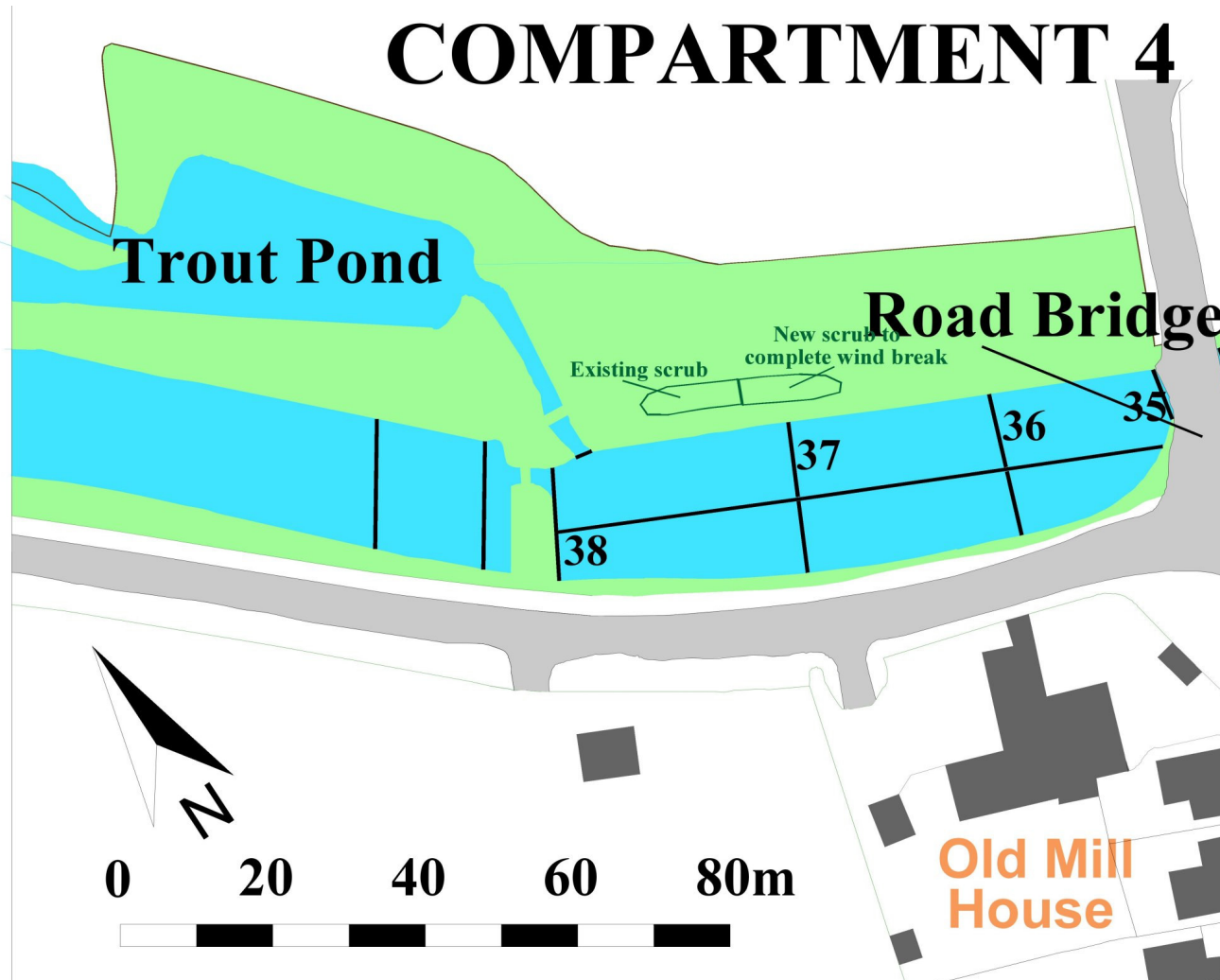
The following plans include numbered dams and watercress beds. These are numbered as in the 2004 management plan. Not all the numbered dams exist on the ground, but the numbering of the 2004 plans has been retained to provide consistency for those working on the site.

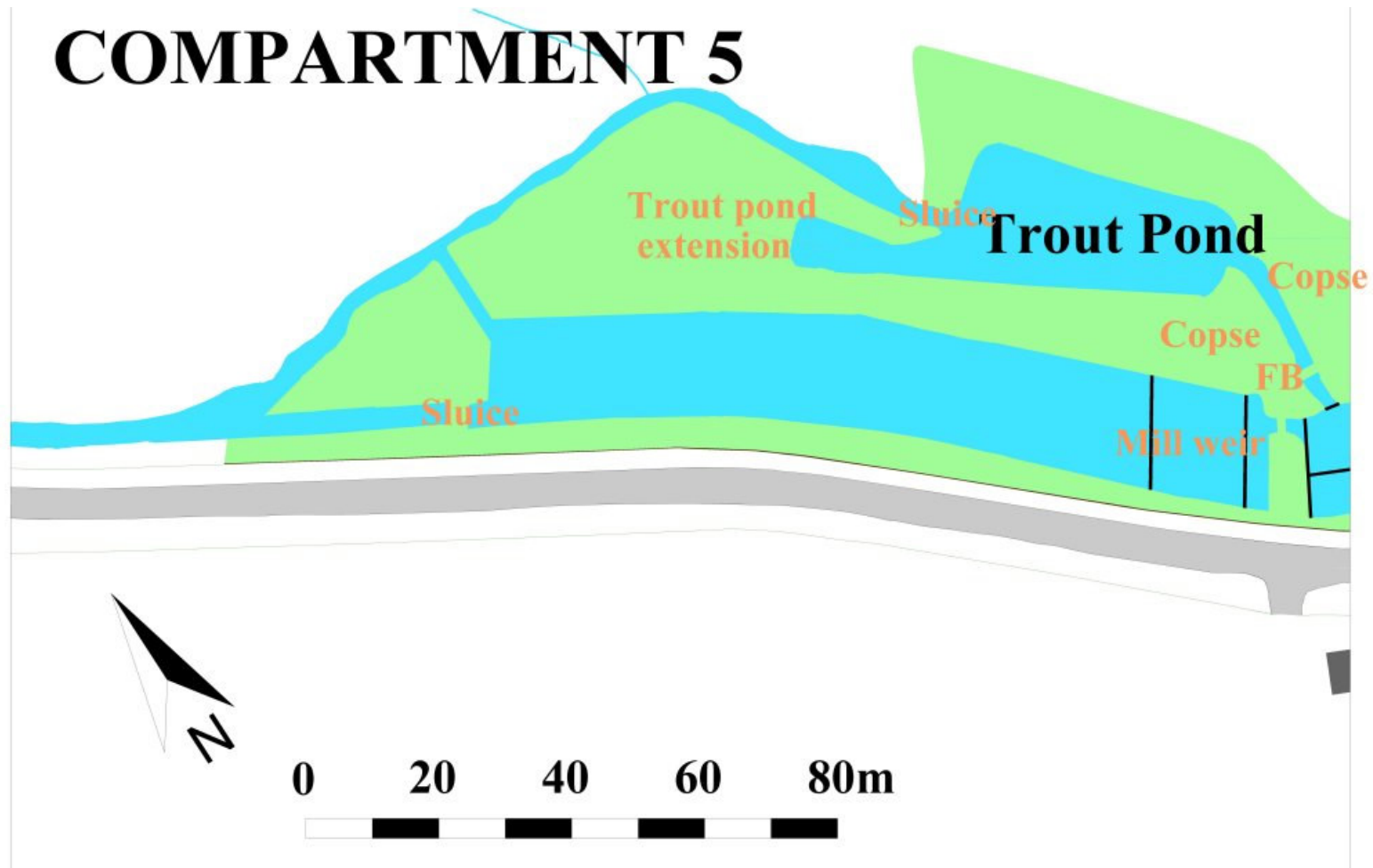
Proposed areas of scrub planting are shown in the plans of compartments 1 and 4 below. The proposed location for demonstration watercress beds is shown in the plan of compartment 2.











## 7. Management projects

Management projects are arranged according to the objective to which they relate, and by priority. Some projects are repeated under different objectives. This either emphasises that a particular activity is necessary across the board (keeping accurate, accessible records) or illustrates that one project can help to achieve more than one objective.

For some it is important that they are carried out when needed, for legal or other reasons; these are priority 1. Priority 2 projects are those that it would be very useful to carry out as planned. Priority 3 projects are less urgent, but could benefit the site in some way, and are to be carried out if time and other circumstances allow. Some projects are included in the plan, but need only take place if a need is identified through a monitoring or inspection project. Lower priority projects (and any high priority projects that have not been completed) can be rolled over into the following year, so this table is intended for guidance. A priority 2 project that is rolled over may become priority 1 in the following year, depending on the circumstances. Annual schedules should be drawn up by the management committee towards the end of each year, for the year following, after reviewing completion of projects and results of monitoring for the current year.

Projects may also be moved to different years, depending on funding, availability of labour, etc, by agreement with the management committee. Some projects scheduled for 2008/09, such as moving paths to increase water vole habitat, may have already been completed. Projects may require more detailed work plans to ensure they are carried out in an appropriate manner.

MT=management team

CN=consultant

MC=management committee

CT=contractor

V=large volunteer groups, or individuals, to include neighbouring landowner volunteer groups, as appropriate

VN=neighbouring landowner volunteer groups

RAFB=RAF Benson volunteers

**To optimise the historical, ecological and landscape interest of the Ewelme Brook within the LNR**

<b>Priority 1</b>								
<b>Management/monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Visual inspection of watercress beds structures	all compartments	Winter	MT	X	X	X	X	X
Maintenance/replacement of watercress beds structures	all compartments	As needed, but to avoid late March-September	MT/ CT					
Visual inspection of other historic structures	e.g. old corn mill/gun emplacement used as bat hibernaculum		MT	X	X	X	X	X
Maintenance of other historic structures	e.g. old corn mill/gun emplacement used as bat hibernaculum	As needed, but not if bats roosting	MT/ CT					
Clear willowherb and other invasive species	from bypass channel	As needed, but avoiding disturbance of water voles	MT with V	X	X	X	X	X
Monitor water levels	In bypass channel. To avoid overtopping the earth bund	When water levels are high	MT/ V	X	X	X	X	X
Divert excess water from bypass channel through watercress beds.	To avoid over-topping the earth bund.	Only if necessary	MT					
Clear other vegetation from bypass channel, including water crowfoot.	To avoid over-topping the earth bund.	Only in exceptional circumstances, when earth bund in danger of overtopping and subsequent erosion	MT/ V					

Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/ V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Consult EA	management of bypass channel and/or regulation of flow	Annual, or as needed	MC/ MT					
Raise watercress	to plant up demonstration beds	If needed	MT					
Plant up demonstration beds		If needed, at appropriate time of year	MT/ V	X	X	X	X	X
Clear central and/or side channels through watercress beds to maintain water flow.	All compartments. Avoid removing bankside or marginal vegetation in side channels. Avoid wholesale removal of crowfoot.	As needed	MT with V or VN	X	X	X	X	X
Control water levels in demonstration beds	To ensure good growing conditions and to avoid over-topping bunds	As needed	MT	X	X	X	X	X
Control water levels in other beds	To avoid over-topping bunds	Only if needed	MT	X	X	X	X	X
Dig out reedmace	In first and second beds below road bridge.	In winter	MT, RAF B or V	X	X	X	X	X

**To maintain or increase the available habitat for water voles**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Move path away from bank edge	between Nellie Bridge and second pump house (compartment 1)		MT	X				
Move path away from bank edge	between interpretation board and bramble hedge (compartment 4)		MT	X				
Close path along bank edge	between bramble hedge and hazel copse (compartment 4)		MT	X				
Water vole surveys	Participate in surveys as part of the BBOWT water vole project (all compartments)	Mar-Sept	V	X	X	X	X	X
Water vole surveys	Systematic survey of water vole activity (all compartments, including Trout Pond)	Monthly, Apr-Sept, for a three year period	CN/V		X	X	X	
Manage banks, by topping at least 10cm above ground in summer, 15cm if cut September onwards.	On northern bank, compartment 4	Only if needed, not more than 50% in 30-50m sections	V	X	X	X	X	X
Manage earth bund vegetation by cutting	Compartments 1 and 2	Only if needed. Not cut below 30cm height. Cut willowherb before flowering, to control	V	X	X	X	X	X

		spread.						
Maintain willow spiling, by cutting	Two sections in compartment 3	Annually, in winter	V	X	X	X	X	X
Maintain willow spiling, by cutting	Compartment 4, north bank	Annually, in winter	V	X	X	X	X	X
Source and install mink raft	Compartment 5	When available	MT	X				
Check and maintain mink raft		Daily, if possible	MT	X	X	X	X	X
Install mink traps as needed		If any sign of mink	MT					
Check and empty mink traps. Deal humanely with any trapped animals		Check several times daily, when traps active	MT					
Check guidelines for dealing humanely with trapped mink		Annually	MC	X	X	X	X	X
Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Manage banks, by topping at least 10cm above ground in summer, 15cm if cut September onwards.	Compartment 1, south bank	Only if needed, not more than 50% in 30-50m sections. At least 50% to be retained above 50cm height over winter.	MT with V	X	X	X	X	X
Work with and encourage neighbours to manage banks and adjacent CS land in line with management plan objectives	Meet with neighbours who would like to work as (a) volunteer sub-group(s)		MT	X				
Work with and encourage	Set up programme of tasks	As appropriate to tasks and	MT	X				

neighbours to manage banks and adjacent CS land in line with management plan objectives	and work together to complete	level of neighbours' involvement						
<b>Priority 3</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Manage banks, by topping at least 10cm above ground in summer, 15cm if cut September onwards.	Compartment 2, south bank	Only if needed, not more than 50% in 30-50m sections, by arrangement with landowner.	MT	X	X	X	X	X

### To optimise the ecological value of the trout pond and surrounding area

<b>Priority 1</b>								
<b>Management/monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Monitor presence of soldier flies, hoverflies, craneflies,	using malaise trapping or larval survey (soldier flies only).	Timing dictated by methodology. Approx every five years.	CN		X			
Tree safety inspection and report	all compartments, including hedgerows	Approx. every five years	CN	X				
Tree safety/longevity works	all compartments, including hedgerows	As needed, in line with consultant's report	MT with V and/or CT	X	X	X	X	X
Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Monitor extent of reedmace	using fixed point photos	Annually, in August	MT	X	X	X	X	X
Dig out reedmace	small patch up to 5m <sup>2</sup> each year	Winter (Sept-March)	MT with V	X	X	X	X	X
Consult on other control methods for reedmace	if 25% coverage exceeded in Trout Pond	If needed	MT/MC					
Survey species/abundance of aquatic invertebrates	in Trout Pond and extension	Timing to be decided by consultant	CN		X			
Maintain open water habitat	In Trout Pond extension	Following aquatic invertebrates survey	MT/V					

**To maintain or improve the wildlife value of the grassland areas**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Annual grass cut and removal	Compartment 1	Late August – October depending on weather	MT with V	X	X	X	X	X
Annual grass cut and removal	Compartment 4	Late August – October depending on weather	MT with V	X	X	X	X	X
Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Survey	Seeded patches, compartment 1	June/July	V	X	X	X		
Feasibility study for ponds	Compartment 1, vegetation surveys, detailed data on ground water levels, and soil data		CN				X	
<b>Priority 3</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Plant scrub	Compartment 1, two or three small patches	November - January	MT/V			X		
Plant scrub	Compartment 4	November - January	MT/V			X		

**To optimise the ecological value of hedges, scrub and trees**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Tree safety inspection and report	all compartments, including hedgerows	Approx. every five years	CN	X				
Tree safety/longevity works	all compartments, including hedgerows	As needed, in line with consultant's report	MT with V and/or CT	X	X	X	X	X
Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/V	X	X	X	X	X
Maintain bird boxes		When unoccupied	MT/V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Maintain hedges/scrub by cutting	Hedge adjacent to High Street, compartment 2	November – January, when dormant	MT/V	X	X	X	X	X
Maintain hedges/scrub by cutting	Hedge along southern boundary, compartment 4 and 5	November – January, when dormant	MT/V	X		X		X
Maintain hedges by planting up gaps	Hedge on top bank, compartment 1, as needed	November – January	MT/V	X		X		
Maintain hedges/scrub by laying/coppicing	Blackthorn thicket, compartment 1	November – January, up to one third of area	MT		X			X
Maintain hedges/scrub by laying/coppicing	Hedge along southern boundary, compartment 1	November – January	MT/V			X		

Maintain hedges/scrub by laying/coppicing	Hedge along southern boundary, compartment 4 and 5	November – January	MT		X			
<b>Priority 3</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Plant scrub	Compartment 1, two or three small patches – see compartment map	November – January	MT/V			X		
Plant scrub	Compartment 4 – see compartment map	November – January	MT/V			X		
Plant hedge	Compartment 1, along western boundary	November – January	MT/V			X		

**To provide educational opportunities and interpretational facilities, in keeping with the resources available to the site, and its location**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Insurance	Renew public liability insurance and check obligations		MC	X	X	X	X	X
Site safety check	Check for hazards and report	Monthly	MT	X	X	X	X	X
Watercress centre building safety checks	Building fabric, fittings, electrical safety, equipment, etc.	Annual, or as appropriate	MC	X	X	X	X	X
Consolidate and maintain historical archive		Ongoing	MT/V	X	X	X	X	X
Create and maintain accurate centralised records	Of completed management and monitoring projects	Ongoing	MT/V	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Make education pack available to view	at open days/guided walks and CS education events	As appropriate	MT, V	X	X	X	X	X
Maintain contact with local schools	Primary/secondary schools	Ongoing	MT, V	X	X	X	X	X
Facilitate and supervise school visits	Up to an average of one per month		MT, V	X	X	X	X	X
Organise and advertise one public guided walk/open	Guided walks on Sunday mornings October-April.		MT, V	X	X	X	X	X

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day per month	Open days on Sunday afternoons May-September							
Take bookings for private guided walks	Up to twelve per year. No more than three in one month.		MT, V	X	X	X	X	X
Demonstrate traditional watercress planting techniques	in selected demonstration bed	On appropriate guided walk/open day	MT, V	X	X	X	X	X

**To provide open (permissive) public access on paths and open grass areas in compartments 2, 4 and 5; and to provide supervised public access in compartment 1**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Insurance	Renew public liability insurance and check obligations		MC	X	X	X	X	X
Site safety check	Check for hazards and report	Monthly	MT	X	X	X	X	X
Mow paths	Circular route in Compartment 1	At least twice per month, from April, as necessary. (Try to avoid evenings)	MT	X	X	X	X	X
Mow paths	Wide path along northern bank in Compartment 2	At least twice per month, from April, as necessary.	MT	X	X	X	X	X
Mow paths	Paths in Compartments 4 and 5	At least twice per month, from April, as necessary.	MT	X	X	X	X	X
Gate across Nellie Bridge	Survey for water vole activity and liaise with EA/BBOWT	Prior to installation	MT	X				
Gate across Nellie Bridge	Install	Avoid late March - Sept	MT and V/CT		X			
Display access map on notice-board and website.	Clear indication of areas with supervised access only, and no access.	ASAP and map to remain <i>in situ</i>	MT	X				
<b>Priority 2</b>								
Maintain boundaries	Fence on southern	As needed	V	X	X	X	X	X

	boundary compartment 1							
Maintain boundaries	Manage verge outside fence on road side of Compartment 4, by strimming	As needed	V	X	X	X	X	X
Organise and advertise one public guided walk/open day per month	Guided walks on Sunday mornings October-April. Open days on Sunday afternoons May-September		MT, V	X	X	X	X	X
Take bookings for private guided walks	Up to twelve per year. No more than three in one month.		MT, V	X	X	X	X	X

**To encourage public participation and harmonious relations with local residents and site neighbours**

<b>Priority 1</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Advertise programme of workdays, guided walks and open days			MT	X	X	X	X	X
Insurance	Renew public liability insurance and check obligations		MC	X	X	X	X	X
Site safety check	Check for hazards and report	Monthly	MT	X	X	X	X	X
Advertise workday tasks	On website and notice board	Approx. one week before task date	MT	X	X	X	X	X
Refer comments/questions to point-of-contact in management committee		On-going, as needed	MT	X	X	X	X	X
Prepare annual report	Progress towards achieving management plan objectives		MC	X	X	X	X	X
Organise annual meeting	Review progress towards achieving management plan objectives		MC	X	X	X	X	X
<b>Priority 2</b>								
<b>Management/Monitoring Activity</b>	<b>Detail</b>	<b>Month/timing/limits</b>	<b>Who</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/21</b>	<b>2012/13</b>
Work with and encourage neighbours to manage banks	Meet with neighbours who would like to work as (a)		MT	X	X	X	X	X

and adjacent CS land in line with management plan objectives	volunteer sub-group(s)							
Work with and encourage neighbours to manage banks and adjacent CS land in line with management plan objectives	Set up programme of tasks and work together to complete	As appropriate to tasks and level of neighbours' involvement	MT	X	X	X	X	X

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## 8. Acknowledgements

With grateful thanks to the very many people who engaged with the review process and provided useful comments and information at various stages. In particular, thanks are due to those who provided technical information, corrections and comments, those who attended any of the various consultation meetings, and those who visited the site to offer the benefit of their expertise. Special acknowledgment is due to the members of the Management Plan Review Committee, who gave an enormous amount of their own time and energy to this project. Without their hard work this plan could not have been completed.

## 9. References

### Printed material and electronic resources

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### **Personal communications**

All personal communications cited took place during the process of review. I.e. between December 2007 and May 2008. These were either in face-to-face meetings, telephone or email conversations, or, in the case of Desmond Dix, a letter and information handed over in person at one of the consultation meetings.

**Desmond Dix**  
**Julia Armstrong**  
**Beryl Hunt**  
**Rod d’Ayala**  
**David Langston**