

Friends Of The Emm Brook

"Protecting and Enhancing the Emm Brook and its Floodplain for Wildlife and People"

MANAGEMENT STRATEGY FOR THE EMM BROOK

Proposed by the Friends of the Emm Brook

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The Emm Brook Management Strategy

1. Introduction

Following a survey carried out by Stuart Colgate for the Berkshire Buckinghamshire and Oxfordshire Wildlife Trust in 2003/4 (funded by the Wokingham Society), a public meeting was held in Wokingham in September 2004. Subsequently The Friends of the Emm Brook (FOTEB) was established to address public concern over the Emm Brook in Wokingham District. At a meeting of the FOTEB Steering Committee in January 2005 the following over-arching aim was agreed:

‘Protecting and Enhancing the Emm Brook and its Floodplain for Wildlife and People’

FOTEB was founded by the local community and contains a wide cross section of the local population. Members have a wide range of interests and skills and consequently a number of sub-groups have been set up to address particular areas. The Management Strategy Sub-Group was charged with producing a strategy document for the entire length of the Emm Brook that would further the group’s agreed over-arching aim. The Emm Brook Management Strategy is therefore the result of collaboration between the sub group charged with producing it, FOTEB members, the wider local community and Wokingham District Council. This partnership has identified the following key objectives for the Strategy, which are not in priority order.

- (1) To identify, maintain and enhance the wildlife value of the Emm Brook and its floodplain.
- (2) To identify, maintain and enhance appropriate amenity access to the Emm Brook and its floodplain.
- (3) To maintain an active Friends of the Emm Brook group.
- (4) To undertake baseline wildlife surveys and to monitor notable wildlife populations.
- (5) To raise public awareness of the amenity and wildlife value of the Emm Brook and its floodplain.
- (6) To divide the Emm Brook and its floodplain into appropriate sections and to produce detailed management proposals for each of the identified sections.
- (7) Promote the designation of appropriate sites as Sites of Special Scientific Interest (SSSI), Wildlife Heritage Sites (WHS) or Local Nature Reserves (LNR).
- (8) To influence land use planning decisions affecting the Emm Brook and its floodplain.
- (9) To maintain links with key partners including the local community, riparian owners, District, Town and Parish Councils, The Wokingham Society, Berkshire Buckinghamshire and Oxfordshire Wildlife Trust, Thames Valley Environmental Records Centre and the Environment Agency.
- (10) To monitor obvious pollution incidents and report them to the Environment Agency.

1.1 Description of the Emm Brook

The Emm Brook takes water from several places including Crowthorne Woods Special Protection Area (SPA), which lies between Crowthorne, Bracknell and Bagshot. It also takes water from land at Easthampstead Park (Bracknell) Wellington College (Crowthorne) and the grounds of the Transport and Road Research Laboratory via Heath Lake SSSI and Queen's Mere.

Much of the water flowing into these streams flows off heathland and coniferous woodland with acidic soils, so the water is naturally acidic which often manifests itself as a bright orange-brown deposit in the silt and on vegetation in the stream channel. Acidic water favours the survival of plants and animals more adapted to this type of environment.

The water from all these sites flows northwards where two main branches of the Emm Brook converge in the Chapel Green area. It continues to flow northwards through Wokingham, leaving the town at Toutley Bridge, on the edge of Emmbrook. The stream passes beneath the junction of the M4 and A329(M) motorways continuing via Merryhill Green and Dinton Pastures Country Park, around Lavells Lake LNR, to its confluence with the River Loddon.

1.2 Implementation

This Management Strategy is a framework from which we expect plans, actions, projects and further ideas to evolve over time and is therefore to be regarded as a 'living document' that will be subject to regular reviews. FOTEB intends to produce detailed management proposals for the Emm Brook within ten Section Action Plans, over the period of this Strategy.

It must be stressed that most of the land adjacent to the Emm Brook is privately owned. FOTEB is not in a position, nor would it wish to be, to dictate actions that should be taken by the riparian owners. Instead, we would wish to work closely with the riparian owners to agree appropriate action plans with them.

Action plans for the sections of the brook that are owned and managed by Wokingham District Council are likely to be easier to agree, as this document has been drawn up with the active support of the Countryside Service of the Council.

2. Threats to the Emm Brook

2.1 Water Quality of the Emm Brook

The Environment Agency (EA) monitors the quality of the 12km of the Emm Brook at four sampling points. These are situated above Easthampstead Park Sewage Treatment Works, at the A321 in Wokingham, above the confluence with Ashridge Stream and at Merryhill Bridge.

The EA assess river quality using a survey called the General Quality Assessment (GQA) scheme. This measures three aspects of river quality – biology, chemistry and nutrient levels. The Emm Brook is currently classified under category RE4 (RE1 being very good quality, and RE5 poor quality); this means that the waters are, in general of fair quality. For chemistry and biology they classify the river from A down to F. The biological classification is at level C - Fairly Good. This equates to the biology found being slightly worse than expected for a similar unpolluted river. The chemical classification is given as a B - Good. This means it is suitable for all abstractions, capable of supporting very good Salmonid and Cyprinid fisheries and that the ecosystems are at or are close to natural levels. Nutrients are analysed for nitrate and orthophosphate. The EA don't classify these as "good" or "bad" but just apply grades 1 (very low presence of nutrients) to 6 (very high presence of nutrients) They do this because rivers across the country naturally have different levels of nutrients and is not necessarily bad for the environment.

The River is open to pollution at a great number of different sites, from agricultural runoff from the many farms, to the discharge of surface waters from roads and other “hard” areas. There are two major sewage treatment works discharges at Easthampstead Park and Wokingham as well as a few much smaller consented discharges. Due to its path through the centre of Wokingham, the river is also open to pollution incidents from light industry and fly tipping, though significant damage of this sort is rare, with only five incidents in the last three years. By working with the local authorities, focus groups, businesses and users, the EA strive to prevent pollution occurrences and improve the quality of the Emm Brook.

2.2 Amenity Use of the Emm Brook and its floodplain

There are two distinct types of threat in this category

- Threats caused by amenity use
- Threats to the use for amenity purposes

These threats, to some extent, contradict each other in that the greater the amenity use permitted, the greater the threat to the natural habitats. However, the greater the protection that is provided, the less that people will be able to enjoy the beauty of the river.

Public use of the land adjoining the brook has the obvious potential to disturb plants and wildlife, leading to the reduction or loss of species. This in turn could lead to other, less desirable, species moving into the space vacated. The more that the land is used for recreational use, the greater the potential for damage to the land and infrastructure that could increase the maintenance costs – such as wear and tear on paths and bridges. Litter can be extremely harmful to wildlife. Beyond this, there is an ever present risk of vandalism on several stretches of the brook.

Although some parts of the brook are quite accessible, others are bordered by private property. This can provide a great degree of protection to wildlife, but equally can hide damage to the environment. Although water quality is measured occasionally, there is an ever-present risk of contamination, or just the use of the river bank as a rubbish dump.

Any change to the management regime of the public parkland has the potential to alienate public opinion since it can be perceived as restricting the use or appearing to be a cost-cutting measure.

Even in those sections of the river where public footpaths exist there are artificial restrictions to use by the whole population. There are stiles and other barriers that have to be negotiated, with no provision for the less mobile or families with pushchairs.

The task of this Strategy and the subsequent detailed plans is to balance the requirements of both people and wildlife so that all can co-exist to the maximum extent possible.

Vigilance is needed to ensure that existing public access is not removed through the blocking of footpaths or other uses of the adjoining land. That does not necessarily mean that there will not be specific locations where it might be desirable to restrict access if there is a high risk to specific habitats.

2.3 Invasive Alien Species

Invasive non-native species can colonise large areas to the detriment of our native flora and fauna. For instance wild rhododendron (*Rhododendron Ponticum*), left unchecked will smother native bluebells or heather with its dense, evergreen shade. A number of non-native plants could survive in or along the Emm Brook and its floodplain.

Himalayan Balsam (*Impatiens Glandulifera*) : Originally imported from Himalayan Asia via Canada. Grows to 3 metres and generally spreads by seed annually along riverbanks. Is common enough on the banks of the Emm Brook to warrant action to contain its spread (as eradication is probably impossible).

Japanese Knotweed (*Fallopia Japonica*) : Originally imported from Japan as an ornamental. Grows to 3 metres and has an extensive root (rhizome) network, but does not set viable seed in the UK. The banks and floodplain should be monitored regularly and, if found, action should be taken promptly to eradicate it.

Australian Swamp Stonecrop (*Crassula Helmsii*) : Originally imported from Australia/New Zealand. Grows on damp soil, in shallow water or submerged in ponds, lakes, wetlands. It is highly invasive and prompt action should be taken to contain it should it be found in the Emm Brook.

Other non-native species, such as Rhododendron (*Rhododendron Ponticum*), laurel (*Prunus Laurocerasus*) and various garden plants could “escape” and grow along the Emm Brook. If necessary, steps should be taken to contain them.

Signal Crayfish (*Pacifasticus Leniusculus*) : Introduced from America for commercial reasons about 30 years ago. Grows larger than our native White-clawed crayfish and competes for sites and food. May also carry a fungal disease, crayfish plague, which has been devastating to native crayfish.

Mink (*Mustela Vison*) : Introduced from North America for fur and escaped/released in UK since 1929. Prey on rabbits, water voles, fish, birds & eggs, invertebrates. Indeed it has been blamed for serious decline in the water vole. Recently mink numbers have declined as the otter population recovers.

2.4 Inappropriate Development

There is probably not much scope for building development within the floodplain, but there are serious threats from development on land in the areas on either side of the Emm Brook. New house building or industrial construction could lead to a need for new roads, bridges and culverts, all of which could adversely affect the flow, quality, amenity and the wildlife aspects of the brook. Any alteration of the existing water run off could lead to the enlargement of the Emm Brook floodplain, which could alter the nature of the brook entirely.

2.5 Inappropriate Management of the Emm Brook and its Floodplain

The Emm Brook runs through both open countryside and urban areas and consequently there are a number of different types of inappropriate management. In urban areas parts of the banks and floodplain of the Emm Brook lie in private gardens and consequently management is often aimed at private amenity rather than the wildlife value. In addition there are often compost heaps, bonfire sites or sheds directly adjacent to the banks of the Emm Brook. Fly tipping and the introduction of alien garden species is an ever-present concern.

There are a number of Public Open Space sites along the Emm Brook as it winds its way through Wokingham and these are currently managed with the emphasis on amenity use, with the most of the open areas maintained as short grass.

Where the Emm Brook runs across open countryside (south of Wokingham and between Emmbrook and Winnersh) the land adjacent to the brook is either managed for horse grazing or intensive agriculture (including arable and market gardening).

Lack of traditional management practices such as hay cutting and pollarding of riverside willows has led to a decline of some of the area's wildlife. In the past the Emm Brook and its floodplain would have supported a non-intensive and diverse farmed landscape. This landscape would have incorporated various forms of wildlife friendly traditional management practices such as pollarding, coppicing, hedge laying, traditional breeds of grazing animals and late hay cutting.

2.6 Lack of Wildlife Survey Information

Ideally the management of the Emm Brook and its floodplain should be based on accurate and up to date survey information. Without this, the selection of appropriate management techniques is difficult, with good intentions leading to bad outcomes. The current level of ecological knowledge on the Emm Brook is patchy and incomplete, although some areas are better surveyed than others. The collection of appropriate, accurate data, both ecological and other types, is a high priority if the Emm Brook is to be managed in a balanced fashion for the benefit of both local wildlife and people.

3. Descriptions and Proposed Actions for the Emm Brook

For the purposes of the Management Strategy the Emm Brook has been divided into 10 sections. The sections have been chosen so they can be identified easily for future monitoring. The descriptions are for the most part taken from the Berkshire Buckinghamshire and Oxfordshire Wildlife Trust survey in 2003/4.

No.	From (upstream)	Grid ref.	To (downstream)	Grid ref.
1	Various Sources	SU832651	Chapel Green (confluence)	SU815675
2	Chapel Green (confluence)	SU815675	Finchampstead Road (A321)	SU809680
3	Finchampstead Road (A321)	SU809680	Barkham Road (B3349) industrial estate	SU803683
4	Barkham Road (B3349)	SU803683	Footbridge NE of Woosehill (Safeway)	SU799688
5	Footbridge NE of Woosehill (Safeway)	SU799688	Reading Road (A329)	SU799694
6	Reading Road (A329)	SU799694	Emmbrook Road (opposite school)	SU800699
7	Emmbrook Road (opposite school)	SU800699	Toutley Bridge, Old Forest Road.	SU798705
8	Toutley Bridge, Old Forest Road.	SU798705	M4	SU795705
9	M4	SU795705	A329M	SU784716
10	A329(M) (Dinton Pastures Country Park)	SU784716	Lavells Lake Local Nature Reserve (confluence with the River Loddon)	SU782733

3.1 Section 1 – Various Sources to Chapel Green

The Emm Brook in this area comprises a number of smaller streams, which eventually converge with the streams entering from the east at Chapel Green. Although a stream enters Heathlake, the site is nominally one of the sources of the Emm Brook for the purposes of this Strategy.

Little is currently known about the various streams and their sources upstream from Chapel Green and it will be necessary to survey the area to gather more information.

3.1.1 Habitats

This section of the Emm Brook contains several sites of high wildlife value, including Heathlake Site of Special Scientific Interest. This section contains two acidic lakes, Heathlake and Queensmere, areas of open heathland at Heathlake, Gorrick Plantation and around Queensmere and alongside the stream itself there are significant areas of rare bog woodland.

3.1.2 Species

The species associated with acid lakes and the heathland bird species are particularly important in this section. Pillwort has been recorded at Heathlake, although it has not been recorded for a number of years.

Gorrick Plantation supports breeding nightjar and woodlark, which are protected by the European Birds Directive.

3.1.3 Proposed actions

Actions	Timescale	Comments
Ensure that FOTEB is consulted on the Management Plan for Heathlake Site of Special Scientific Interest (SSSI) and LNR	2006/7	Management Plan will be produced once the English Nature study of site hydrology is complete
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Ensure that there are detailed management statements for all the Wildlife Heritage Sites in this section.	2012	Deadline coincides with the end of the Wokingham District BAP 2003-2012
Ensure that there is an appropriate mgt plan for the Ludgrove School nature reserve.	2006/7	
Locate and map the various streams that converge on Chapel Green	2005/6	

3.2 Section 2 – Chapel Green to Finchampstead Road

The Emm Brook in this section comprises several smaller streams gradually converging to form the main channel, which passes under Finchampstead Road and thence into section 3 (Molly Millar's Industrial Estates). Several public footpaths cross the streams and surrounding habitats from which the winter survey was conducted. These can be located from an Ordnance Survey (OS) map with 3 points of access from Wokingham. The area surveyed was bounded by the railway lines and Finchampstead Road to the north and west; the footpath between Gipsy Lane footbridge and Ludgrove School to the east; the roadway between Luckley Road, Eastheath and Ludgrove School to the south.

3.2.1 Habitats

The dominant habitat in this area is pasture for grazing horses and for riding and jumping. There are also sheep and cattle grazing other fields. Interspersed amongst this were small areas of wet woodland. Wet woodland is a priority habitat within the UK Biodiversity Action Plan. Other habitats include marshy grassland and ditches, open running water with riparian herbs, trees, scrub and hedgerows.

The southern part of this section had frequent gorse, a possible indication of the acid nature of the soil and water associated with the areas to the south.

The Emm Brook tributary running more-or-less parallel to the railway on the western edge of the site drains both the railway embankment and the linear woodland through which it flows, before it reaches Luckley Road. To the north of this road, it meanders through wet grassland, with tussock-forming plants (e.g. rushes and sedges) on either side of the channel.

Two tributaries near Ludgrove School contained orange-brown sediment, which stains the stream bed and the vegetation in contact with the water. This is possibly iron oxide - a substance formed naturally and is indicative of slightly acidic water, due probably to the run-off from heath land and conifer plantations through which the water flows. The adjacent habitats are stands of alder, tall herbs and scattered scrub, including gorse.

3.2.2 Species

During winter, birds seen or heard within this section were recorded and included 6 siskin, 6 greenfinch and 2 chaffinch, siskins being particularly fond of alder. Several species associated with open grassland and pastures included redwing, fieldfare, and green woodpecker. The once common starling, long associated with human habitation and agriculture was present in a flock of more than 50 birds. In the March survey, chiffchaffs were heard singing in the wooded area to the south of Luckley Road, which along with a brimstone butterfly patrolling its territory heralded the coming of springtime. Other species included dunnock, house sparrow, pied wagtail and a flock of about 20 jackdaws foraging in the pastures. Four small tortoiseshell butterflies were also recorded from the section.

3.2.3 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate management plan for Tesco's Pond	2006/7	
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Monitor and investigate further the population of great crested newts in this section	Ongoing	This is likely to be undertaken by Berkshire Reptile and Amphibian Group (BRAG).

3.3 Section 3 - Finchampstead Road to Barkham Road

This section of the Emm Brook flows northwest from Finchampstead Road (A321) to Barkham Road (B3349). It passes through an industrial estate, channelled between commercial units, car parks and residential access roads. In addition to being bridged by 3 or 4 small roads and the railway line within the estate, there is a short section, which is culverted.

3.3.1 Habitats and Species

This section was not surveyed, but a brief visit was made to accessible points where the stream could be seen, namely from roads crossing it. It was narrow and channelled in parts and often heavily-shaded by overhanging trees and shrubs. In the lighter areas emergent plants grew. In other parts the brook was more open with short vegetation on the banks, used as picnic areas by people working in the industrial estate.

3.3.2 Proposed Actions

Actions	Timescale	Comments
Secure the de-culverting of the Emm Brook in this section	2012	This will only be possible on the back of re-development of the site
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	

3.4 Section 4 - Barkham Road to Footbridge NE of Woosehill (Safeway)

This section of the Emm Brook begins where it emerges from flowing beneath Barkham Road, having just passed through the Molly Millar's Lane industrial estates. From Barkham Road it flows northwards alongside private houses and gardens on the eastern side and a narrow strip of amenity grassland on the west. It passes under Meadow Road and continues generally northwards alongside private dwellings in the east and a wider strip of amenity grassland with trees and shrubs on the west. The stream gradually diverges from the dwellings entering an area of amenity grassland and trees. It is joined by the water flowing from two drains from Woosehill, and a little further downstream is a footbridge (not the bridge leading up to the superstore). This marks the end of section 3 and the start of section 4.

3.4.1 Habitats

The brook meanders more or less the entire length of this section. Meanders create shallow banks of silt that collect on the inside of bends where water flows more slowly with steeper eroding banks on the outside of the bends. The stream varies from being cast in dense shade from overhanging trees and shrubs to being open with fringes of tall herbs. Alongside parts of the brook were gardens of private dwellings bounded by fences and hedges. Other lengths were adjacent to amenity grassland with trees, some recently planted and some that had regenerated naturally. There were occasional thickets of shrubs, comprising both native and introduced species. The edges of this linear parkland were both bounded by private dwellings and roads. The water in the channel was between 2 and 4 metres wide and varied from 10 cm to 50 cm depth, with silt covering most of the stream bed. During the summer survey the water flow was generally slow.

3.4.2 Species

Stream and bank vegetation

The water channel supported 4 species of submerged aquatic plants; these were curled pondweed, which was abundant where it occurred, broad-leaved pondweed, common water starwort and the introduced Canadian pondweed. Many other plants typical of the wetland community were recorded with emergents (plants with roots under water but most vegetation above surface) including reed sweet-grass, reed canary grass, purple loosestrife and water plantain. Some herbs were close to the stream on the bank and included redshank, common figwort, water dock and abundant Himalayan balsam (an invasive, introduced species). Common alder, and several willows were noted including white, grey, goat and crack willows along with common osier - all trees of wetland habitats.

Grassland vegetation

The grassland was closely mown and comprised mainly the hardy perennial ryegrass. It also supported flowering plants able to tolerate frequent mowing including common daisy, yarrow, greater plantain and ribwort plantain. The areas of grassland that were mown less intensely such as beside hedges and shrubs included a larger range of species. These included common toadflax, hedge woundwort, white deadnettle and hairy brome.

Trees and shrubs

There were a reasonable variety of trees and shrubs in the areas adjacent to the stream and banks. Some had probably been present before the housing was built. Native trees included field maple, ash, wild cherry, English oak and rowan, although some had been planted. Introduced species included Norway maple, sycamore, red oak, grey alder and weeping willow. Shrubs were present as single plants and also as small thickets and included the native species blackthorn, elder and dogwood, and the introduced and invasive snowberry.

Gardens

Although not a single type of habitat, gardens are important as refuges, nesting sites and food sources for a wide range of animals and plants, including 'garden' birds such as house sparrow, song thrush and starling, all of which have undergone major population declines in recent years and have been placed on the 'red-list' of the UK Birds of Conservation Concern (BDCC). Ponds are also of vital importance for many species especially amphibians (frogs, toads and newts).

Animals recorded during the summer visit included mole. Birds included a kingfisher flying and hunting for food along the brook, no doubt after the abundant fish fry. Blackbird, great tit and wood pigeon were also seen. Two butterflies, the large white and speckled wood were noted along with *Scatophaga*, a flesh fly and spangle galls on oak leaves indicating the presence of the larvae of a gall wasp.

3.4.3 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate mgt plan for the WDC owned Woosehill Meadows site.	2007/8	
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	

3.5 Section 5 - Footbridge NE of Woosehill (Safeway) to Reading Road

This section of the Emm Brook starts at the footbridge to the northeast of Woosehill and southeast of the superstore (Safeway) and flows through an open access linear park (continuous with that of section 4) as far as the Reading Road (A329). Towards the northern end of the section the stream divides into two and converges again further on by a weir. This was where a mill once stood, the flow of water controlled by sluices to ensure water was backed up to allow sufficient flow to drive the mill. It is almost certain that one of these channels was a man made leat to drive the waterwheel at the mill, giving control of the water level for the waterwheel, without creating a blockage in the main stream.

3.5.1 Habitats

Except for the length beyond the weir, the brook in this section was fairly straight as it passed through the parkland, which comprised amenity grassland, well-spaced trees (many of which had been planted), woodland, riparian scrub, stream vegetation and open water. Some lengths of bank were trampled and eroded due to disturbance by humans and animals. Areas of deposited silt and gravel were present within the water channel. The water in the channel was between 2 and 5 metres wide and varied from 5 cm to 50 cm in depth. Silt covered most of the visible stream bed, but gravel and boulders occurred upstream of the weir where silt had been washed away. During the summer survey the water flow was generally very sluggish.

3.5.2 Species

The channel contained a range of aquatic plants including patches of abundant curled pondweed and the introduced Canadian pondweed, along with broad-leaved pondweed and a water starwort. The banks on both sides of the stream had dense patches of stinging nettle, bramble and the non-native invasive Himalayan Balsam. Amongst these were typical native wetland plants including reed sweet-grass, meadowsweet, branched bur-reed and water dock.

Woodland

The woodland surrounding the northern part of the brook including the weir supported many naturally occurring native trees and shrubs, which are able to tolerate occasional inundation from the stream overtopping its gently sloping banks. Trees included common alder, grey and crack willows as well as ash, wych elm and English elm. Shrubs included hawthorn, holly, elder and the introduced cherry laurel and Sachalin willow. Within the woodland were plants that indicated the site had been wooded for at least 400 years. These ancient woodland indicator species included remote sedge, hairy brome, giant fescue and holly. It also supported plants which had invaded from other habitats or were colonisers of disturbed ground, such as hedge mustard, prickly lettuce and nipplewort. The area supports abundant mosses and liverworts.

Grassland vegetation

The grassland of perennial rye-grass was closely mown and supported dandelion, daisy and yarrow, which are able to survive frequent mowing. In areas that were left longer, other grasses and herbs flourished including Yorkshire fog, cock's-foot, hemlock and goat's-beard.

Trees and shrubs

Several trees had been planted, a few of which were native such as hornbeam, English oak and yew but most were non-native including red oak, red alder and white poplar. Aspen and crab apple were also present. Fungi were recorded on fallen dead wood, lichens on living and dead wood.

Animals recorded included mole and the introduced grey squirrel. A householder said he often saw roe deer and fox. Birds recorded during the August visit included kingfisher, grey wagtail (by weir) and green woodpecker.

Seven species of insect were noted including speckled wood and red admiral butterflies, a hawker dragonfly and the seven-spot ladybird.

3.5.3 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate mgt plan for the WDC owned Woosehill Meadows site.	2007/8	
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Address litter problems in this area in partnership with WDC	Ongoing	

3.6 Section 6 - Reading Road to Emmbrook Road

The brook in this section flows northwards from the roundabout where the Woosehill Spine Road joins the Reading Road (A329). The brook soon passes under a railway bridge and into the grounds of The Emmbrook School until it reaches Emmbrook Road, adjacent to the school entrance.

3.6.1 Habitats

A full survey was not carried out in this section, but the stream was viewed from a few accessible places. The stream channel just to the north of the roundabout on Reading Road was about 4 metres wide and 0.5-1.0 metre deep, shaded by trees and shrubs, with private gardens, garages and hard surface car parking adjacent to the banks.

Further along, it flowed between the school playing fields and private gardens. The school fields were separated from the brook by a fenced off strip up to 2 metres wide, which comprised mown vegetation. Some gardens on the opposite side of the brook had lawn to the bank; others had a hedge or fence. Steel revetments were present in places to strengthen banks. The stream channel was straight and clear with no sign of emergent vegetation.

3.6.2 Species

The stream beside the Reading Road was shaded by trees and shrubs including ash and holly with several introduced species including cherry laurel, Portugal laurel, sycamore and Scots pine. The ground flora was species-poor consisting mainly of ivy with scattered male fern. This area would make good cover for birds and mammals although only 3 bird species were recorded during the brief visit, namely blue tit, blackbird and woodpigeon.

In the area beside the school grounds, birds seen were chaffinch, blue tit and magpie, the first 2 making use of the adjacent gardens.

3.6.3 Proposed Actions

Actions	Timescale	Comments
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan. There is no access through this section so is a priority for enhancement
Undertake further ecological surveys	Ongoing	
Address litter problems in this area in partnership with WDC	Ongoing	

3.7 Section 7 - Emmbrook Road to Toutley Bridge, Old Forest Road

Having passed under Emmbrook Road opposite the gates of The Emmbrook School, the Emm Brook meanders through a linear strip of parkland with open public access, bounded on both sides by residential housing and school grounds. At the northern boundary of section 7 it flows beneath Forest Road at Toutley Bridge and then through rough pastures and areas of tall herbs and scrub towards the M4 motorway. A drainage channel from Ashridge Sewage Treatment Plant, which also passes alongside an industrial estate, joins the Emm Brook just south of Toutley Bridge.

3.7.1 Habitats

The brook takes a meandering course through the linear park, which comprises amenity grassland, many planted trees, riparian scrub, stream vegetation and open water. Some lengths of bank were trampled and eroded due to disturbance by humans and animals and areas of deposited silt and gravel were present within the water channel. Some lengths of the stream were bordered by small clumps of trees and shrubs, which cast dense shade over the water and the banks, whereas in more open areas, herbaceous plants were able to thrive. The water in the channel was between 2 and 3 metres wide and varied from 10 cm to 50 cm in depth. Silt covered most of the visible stream bed, but gravel occurred in riffles where silt had been washed away. During the summer survey the water flow was very sluggish but during the winter and spring visits it was reasonably fast.

3.7.2 Species

Several trees have been planted in the amenity grassland along the brook including the native species English oak, aspen, ash, silver birch, rowan and common lime. Non-native trees have also been planted including horse chestnut and hybrid black poplar. Some trees had probably established naturally within this wetland environment including common alder, grey willow, crack willow, goat willow and osier, although there was evidence of management, i.e. pollarding of crack willows in the recent past. Crab apple was abundant in patches, particularly in hedges and scrubby thickets and might have regenerated naturally for many years.

Shrubs found alongside the brook included abundant hawthorn, along with blackthorn, elder and dogwood. Gorse and buddleia had probably been introduced from dumping of garden waste. The stream channel contained three aquatic species, the native fennel pondweed and common duckweed and the introduced Canadian pondweed. A survey carried out for the National Rivers Authority in 1994 also found the aquatic willow moss. Native emergent species recorded included fool's watercress found in dense stands, watercress, hemlock water dropwort and greater reedmace. There was also an abundance of Himalayan Balsam, an invasive, introduced species which can out-compete native plants. On the banks were other wetland plants including water forget-me-not, purple loosestrife, redshank and butterbur.

Other species were noted which are associated with grassland, scrub, disturbed soil habitats. These included meadow foxtail (grass), hemlock, bristly ox-tongue and the ubiquitous stinging nettle. During the April visit wild onion and lesser celandine were frequent.

During the summer, very few birds were recorded, namely wren, chaffinch, woodpigeon and blackbird, whereas in the winter and spring the lists were more extensive and included song thrush (2), redwing (9), fieldfare, goldfinch (10) and greenfinch (4). Evidence of fox and mole was also found.

Abundant fish fry were present in the Emm Brook during summer and an unidentified fish was noted, possibly a trout. Insects recorded included painted lady and large white butterflies, banded demoiselle, white-tailed bumblebee and a species of *Sarcophaga*, a flesh fly.

3.7.3 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate mgt plan for the WDC owned Emm Brook Field site.	2005/6	
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Address litter problems in this area in partnership with WDC	Ongoing	

3.8 Section 8 - Toutley Bridge, Old Forest Road to M4

After passing under Old Forest Road, the Emm Brook flows towards and then under the M4/A329(M) motorway junction. The section is relatively short and is only distinguished from Section 9 because of the physical barrier of the M4 motorway. The brook flows across fields that are not extensively used, having occasional arable crops on one part.

3.8.1 Habitats and species

This section has not yet been surveyed.

3.8.2 Proposed Actions

Actions	Timescale	Comments
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake initial ecological survey	2005/6	
Undertake further ecological surveys	Ongoing	

3.9 Section 9 – M4 to A329(M)

After passing under the M4 motorway near the M4/A329(M) junction the brook flows alongside the A329(M) to the north of Winnersh before flowing under Davis Street into Bluebell Meadows Open Space and then turns north and passes under the A329(M) into Dinton Pastures Country Park in the parish of Hurst.

3.9.1 Habitats and species

This section has not been extensively surveyed, although Bluebell Meadows contains two wildlife ponds that support great crested newts.

3.9.2 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate mgt plan for the WDC owned Bluebell Meadows site.	2005/6	
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Monitor the population of great crested newts in this section	Ongoing	This is likely to be undertaken by Berkshire Reptile and Amphibian Group (BRAG).
Address litter problems in this area in partnership with WDC	Ongoing	

3.10 Section 10 - A329(M) to Dinton Pastures Country Park

The Emm Brook enters Dinton Pastures Country Park and meanders through the Junior Rangers Nature Reserve and events field areas before entering the relatively straight diverted channel that takes the brook under Sandford Lane and around the north of Lavells Lake Local Nature Reserve and into the River Loddon. The original line of the brook meandered through the middle of Black Swan Lake and can still be seen running through one of the lake's islands today.

3.10.1 Habitats

Dinton Pastures and Lavells Lake are very diverse sites with a wide variety of habitats including ancient semi-natural woodland, wet riverine woodland, scrub, wildflower rich meadows, wet grassland, wader scrapes, reedbeds lakes and ponds

3.10.2 Species

Ponds alongside the brook are known to support a substantial population of great crested newts. Daubentons bats have been recorded over the lakes and water voles have been recorded in the lakes but not the brook itself.

3.10.3 Proposed Actions

Actions	Timescale	Comments
Ensure that there is an appropriate mgt plan for the WDC owned Dinton Pastures Country Park and Lavells Lake LNR.	2005/6	
Ensure that FOTEB is formally consulted on the Dinton Pastures Country Park and Lavells Lake LNR mgt plans	2005/6	Lavells Lake LNR already has an appropriate mgt plan.
Produce Access Plan for the Emm Brook	2006/7	In partnership with WDC as they produce their Rights of Way Improvement Plan
Undertake further ecological surveys	Ongoing	
Address litter problems in this area in partnership with WDC	Ongoing	

4. Monitoring and Review of the Strategy

It is intended that this strategy should be a living document that will take account of changing circumstances and opportunities in the Emm Brook catchment. To this end, the Management Strategy sub group of Friends of the Emm Brook will produce an annual progress report for its AGM. In addition the whole strategy will be comprehensively reviewed in 2010.