

# The Parks Trust Biodiversity Action Plan 2017-2022



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# Introduction

## WHAT IS BIODIVERSITY?

Biodiversity is the diversity of all life on earth. It refers to all individual species but also to the complex natural systems which develop between species. Biodiversity also refers to genetic variety within species.

At the Earth Summit held in Rio de Janeiro in 1992, 178 nations signed up to Agenda 21. In recognition of the huge losses in biodiversity in the past 100 years Agenda 21 set out a comprehensive programme of action in all areas of sustainable development. The United Kingdom produced its first Biodiversity Action Plan in 1994 and since then county and regional action plans have been produced. The latest version of the Buckinghamshire and Milton Keynes Biodiversity Action Plan was produced in 2015.

The Parks Trust produced its first Biodiversity Action Plan (BAP) in 2010, covering the years 2011 to 2016. The BAP has guided The Trust's work, ensuring that the natural environment and biodiversity are always considered in our operations. This document is our second edition and covers the period 2016 to 2021.

The conservation of biodiversity is one of The Trust's core values. It is integral to and engrained in the way we work. Whilst The Parks Trust is not a public body, we adhere to the same principle as that placed upon public bodies in the duty of Section 40 of the Natural Environment and Communities Act 2006 "to have regard, so far as is consistent with the proper exercise of its functions, to the purpose of conserving biodiversity."

We have also published a document entitled 'Our Commitment to Biodiversity.' This provides a general overview of the wildlife that can be found in our parks and open spaces and states that our vision is to "create an inspirational environment which maximises the biodiversity of our parks and green spaces". It also sets out our Biodiversity Policy, which is to ensure the objectives of wildlife conservation are given high priority whilst maintaining a sensitive balance with the recreational, amenity and landscape needs across our green estate.

Our 2010 BAP identified ten key habitats and fifteen species requiring their own individual action plans (Habitat Action Plans and Species Action Plans). These habitats and species are all listed in the UK plan as priorities. For this second edition, the HAPs and SAPs have been updated and several new ones are included.

Most recently, an Ecological Advisory Group (EAG) has been established. This group, comprising key members of Trust staff and external experts, meets quarterly. The EAG offers advice and guidance in The Trust's ecological and conservation work. A core group of six regular members is augmented by additional invited specialists as and when necessary. Members of the EAG will also be invited to contribute advice and guidance between formal meetings.

Biodiversity continues to face a wide range of threats in the UK. These include agricultural intensification, ever increasing urban development, climate change, pollution and the increase in non-native and invasive species. All of these threats are present in Milton Keynes to a greater or lesser extent and will be analysed in more detail later on.

## ECOSYSTEM SERVICES

All living things and the physical environment which supports them are part of the stock of natural capital. This natural capital underpins what have become popularly known as ecosystem services, the natural processes such as crop pollination, flood defence, air quality and water quality which are essential for our survival and wellbeing. With increasing awareness of and research into ecosystem services, governments have a greater understanding of the financial value of the natural environment. For example, it has been estimated that insect pollinators are worth £12.6 billion per year to the E.U.

in terms of the crops they pollinate. Such data can clearly be very persuasive and strengthen the cause of biodiversity on a global scale.

Locally, Cranfield University's School of Energy, Environment and Agrifood has been an active partner in the Urban BESS (Biodiversity and Ecosystem Services) initiative, since re-named F3UES. This project seeks to measure how the biodiversity of cities and towns contributes to human wellbeing and to that of other species. The Parks Trust is pleased to be able to support this project and a number of experiments have already been conducted on our land.

## Community Engagement

### EVENTS

The Parks Trust organises and hosts over 200 public events each year on its land ranging from short guided walks which may be attended by 10-20 people to large scale international festivals. Environmental and wildlife themed events have always formed a key part of our events programme and are ever popular. In 2015 The Parks Trust hosted 'Nature Day', a collaborative event with Milton Keynes Natural History Society at Howe Park Wood. This event proved hugely popular and included a nature trail in the wood featuring bird ringing demonstrations and wildlife tracking, as well as pond dipping and numerous exhibits from local wildlife groups. Popular annual events include bat evenings, wildflower walks and a dawn chorus event in May.

In recent years, The Parks Trust has begun to host BioBlitz events. BioBlitzes are intensive surveys of a particular wildlife site, usually for 24 hours or more and are open to wildlife specialists and the general public alike. The dual aims of these events are to provide a full audit of a site's flora and fauna at one moment in time and to encourage more people to develop an interest in recording biodiversity. The 'race against the clock' element of a BioBlitz makes them great fun and suitable for school or other youth groups. The acquisition of Linford Lakes Study Centre and completion of Howe Park Wood Visitor Centre make these two venues ideal for future events.

### VOLUNTEERS

The Parks Trust is supported by over 200 volunteers who regularly assist our work in many ways including practical conservation, environmental education, cleansing, events stewardship, photography and wildlife surveys. The largest number of volunteers are those who carry out practical work, delivering habitat enhancements, construction jobs and other improvements in our parks. Typical activities for volunteer groups include coppicing, hedge-laying, pond restoration and building artificial otter holts. We provide training to our volunteers in various practical skills and where possible pay for them to attend external training courses. In addition, two 'Friends' groups are established, the Stony Stratford Riverside Parks Group and Friends of Linford Lakes Nature Reserve.

These two groups, while independent of The Trust, work closely with us to help maintain and deliver public events in Millfield, Stony Stratford and Linford Lakes respectively.

We believe that everyone in Milton Keynes should have the opportunity to volunteer with us and community engagement is one of our core objectives. Besides working with individuals (some of whom stay with us for many years) we also work with groups and local businesses, organising bespoke community action days and team building activities. These usually take the form of conservation work parties or large-scale litter picking days.

Volunteers have assisted with ecological surveys such as breeding birds, dragonflies, otters and bats. We now have five butterfly transects established across our green estate which could not run without volunteers. Recently, we have coordinated effort with specialist groups such as North Bucks Bat Group, Bucks Bird Club and Milton Keynes Natural History Society whose volunteers have contributed a vast amount of time and effort to ecological monitoring on Parks Trust land.

## ENVIRONMENTAL EDUCATION

Environmental education is one of the Trust's core charitable objectives. We operate an extensive programme of educational and community events to promote understanding and enjoyment of our parks. These provide for all ages and are offered all year round. Many sessions are based on discovering and understanding biodiversity and for many children (and adults) participation in one of our educational events is their first chance to experience the natural world 'close up'. Our aim is to offer a learning experience that is fun as well as educational and to give participants more understanding of their local environment, which will help ensure our parks and the biodiversity within it are valued and respected in the future. In the academic year 2014-2015 the education team worked with 6,626 children. This is from schools, after school groups, Forest Schools and Youth Rangers.

### **Environmental education objectives:**

- Enable children to grow up in Milton Keynes loving, valuing and respecting the parks
- Achieve provision of a continuity of outdoor environmental education for those of all abilities, through childhood and all stages of adulthood, to increase understanding of the parks and appreciation of the natural world and how the environment works
- Provide support for schools' work on the national curriculum, including support of teachers, as far as this relates to The Trust's land and activities and to development of environmental skills and knowledge
- Ideally, enable every school child and college student to engage in outdoor education at least once during each Key Stage of the national curriculum
- Use our educational engagement to support children, adults and families through their use of the city's parkland and to work with all parts of the community including those who are more difficult to reach
- Develop understanding by residents and visitors of the value of our parkland so they use it well, do not damage or litter it and take account of risks particularly relating to water
- Enable people to understand the importance of our open space and the many ways in which it contributes to the quality of life and to the environment of Milton Keynes, also how it is managed
- Provide outdoor educational experiences which enhance knowledge of the environment and the reputation and profile of The Trust.

## SCHOOL ACTIVITIES

Our work with schools is linked into the National Curriculum and the full list of educational activities can be seen on our website: <http://www.theparkstrust.com/education/schools-and-pre-schools>

## ADULT EDUCATION

Since 2008 the education team has offered a series of monthly activities designed to educate the public on different aspects of the parkland in Milton Keynes. These sessions have included identification for beginners in subjects such as butterflies, fungi, birdsong, trees and wildflowers. They have also included more practical activities such as basket weaving and hedge-laying. These activities continue to be popular and have been extended to include a series of talks over the winter period, as well as the monthly events.

## ENVIRONMENTAL STUDY CENTRES

For many years The Trust has identified the need for dedicated study centres on its land to enable us to deliver a wider range of activities and to provide classroom and wet room facilities for example. We now have two such centres at Howe Park Wood (which was built in 2014) and Linford Lakes Nature Reserve, which we purchased in 2015. These two centres enable the education work with schools to practically take place over an entire day, as classrooms and toilet facilities are now available. This will enhance the sessions we offer groups, and provide another opportunity to explain to the public about the work of the Trust and the habitats that are managed locally.

By offering birthday parties and corporate activity days at the centres, we can engage with other groups that we may not have reached before. The two sites have a unique draw of both species and habitats, so this will be advertised and incorporated into the packages offered.



Howe Park Wood Study and Visitor Centre shortly after completion in 2014

## LANDSCAPE SCALE CONSERVATION

The Government's Natural Environment White Paper of 2011 highlighted the need for a change of approach to conservation in England. It found that conservation effort had traditionally focussed on nature reserves which were becoming ever more fragmented and isolated as land management between them became more hostile for wildlife. The Paper concluded that we need to make our network of nature reserves "bigger, better and more joined up". Conservation bodies and NGOs have been quick to embrace this move to conservation at the landscape scale and there are many exciting projects underway across the UK.

Some of the rare and threatened species which occur in Milton Keynes are found at just one or two sites and would benefit from this approach. For example, the black hairstreak butterfly occurs in small, vulnerable populations at Howe Park Wood and Oxley Mead, so the planting of blackthorn between the woodland and the North Bucks Way would create a bridge, allowing the two populations to join up over time. (The Parks Trust is likely to adopt Oxley Mead SSSI in the near future which will enable us to monitor and manage the blackthorn thickets for this rare species). In the same way, even within our land ownership there will be opportunities for better connectivity. Areas of regularly mown grass between wilder habitats can present a barrier to many plants and invertebrates and in such areas leaving a narrow unmown margin could make a vast difference.

The Parks Trust owns a number of large linear parks such as the Ouse and Ouzel Valley Parks. The recent acquisition of Linford Lakes Nature Reserve means that we now manage three locally important wetland sites along the Ouse Valley and much of the land in between. However, The Parks Trust will seek to acquire more land in the Ouse Valley and where possible to work with its neighbours to ensure more land is managed with biodiversity in mind. The Ouse Valley is one of 24 Biodiversity Opportunity Areas (BOAs) which have been identified in Buckinghamshire and Milton Keynes. As the main riparian land manager in Milton Keynes, The Trust will be a key stakeholder in the Ouse Valley BOA project seeking ways to maximise conservation effort within the local catchment.

## CHALLENGES & OPPORTUNITIES

Our ecosystems face many challenges and issues and arresting and reversing the declines in our biodiversity is no simple matter. A few of these challenges are listed below:

### CLIMATE CHANGE

One of the greatest threats to biodiversity, nationally and globally, is climate change. Already in the UK we have seen significant changes in species distribution as temperatures rise. It is believed that the UK will experience more extreme weather events, including floods, droughts and winter storms. Seasonal changes will be detrimental to species which cannot adapt quickly enough. For example, warmer springs can result in birds nesting before there is sufficient insect food (typically caterpillars) available for their fledglings. Climate warming brings with it threats to biodiversity including fungi and bacteria which attack our trees. However, rising summer temperatures are already seeing many new, beneficial insect species colonising Britain from mainland Europe and monitoring some of these changes in our insect fauna and feeding the results into national recording databases will be very important.

### URBAN DEVELOPMENT

As a growing town, there is ongoing urban development in Milton Keynes. Currently this is occurring mainly in the Eastern and Western Expansion Areas (designated in 2005). Further expansion areas and other development scenarios for the city are currently being considered as Milton Keynes Council prepares its new local plan – Plan:MK. Inevitably, these new developments where they occur on greenfield sites or even older brownfield sites involve some loss of habitat whether it be pasture, meadows, scrub, ponds or hedgerows. There is also an impact on biodiversity from the increased human population and from their pets, who may disturb and prey upon vulnerable animal populations.

However, mitigation programmes are put in place for protected species which provide opportunities for many other associated species. We also have the opportunity to work with developers to ensure that features such as swift nest bricks, turf roofs and bat boxes are incorporated into their designs. New housing estates incorporate Sustainable Urban Drainage Systems (SUDS) which also offer new habitats for a wide range of species, especially aquatic invertebrates. The SUDS and the species-rich grasslands around them are known to function very well as green corridors and many species are likely to use them for dispersal to new sites. Maximising opportunities for urban wildlife in Milton Keynes will be crucial as the city continues to grow over the coming years.

## POLLUTION

Pollution of watercourses from agricultural runoff, sewage leaks and industrial accidents can have devastating and far reaching effects. These effects can include major fish kills, sedimentation of gravels and a massive increase in nutrients. In extreme pollution events there can be threats to human health. In Milton Keynes the main reason for waterbodies not reaching 'good ecological status' under the Water Framework Directive has been identified as high phosphate levels. The Trust will continue to work in partnership with The Environment Agency to improve the quality of our waterbodies wherever possible.

## INVASIVE SPECIES

Non-native invasive species present another challenge to our native biodiversity. Invasive plants on our land include New Zealand pygmyweed *Crassula helmsii* and Himalayan Balsam *Impatiens glandulifera*. *Crassula* is present in at least two of our parks. It is one of the most invasive of all aquatic plants and is capable of completely choking small waterbodies and out-competing native aquatics. Himalayan Balsam clothes the banks of the River Ouzel in the summer. It shades out native plants and its shallow root systems destabilise the banks. Non-native animals like Signal Crayfish, American Mink, Muntjac Deer and Red Eared Terrapin have been introduced locally and each of them poses a threat to a variety of native species.

## DISEASES

There are an increasing range of diseases which pose a serious threat to our established tree species. The most notable of these is Ash Dieback *Chalara fraxinea* which is likely to strike a high proportion of our ash trees in the near future. We have already seen our Horse Chestnut trees affected by the Leaf Minor Moth *Cameraria ohridella* and accordingly we no longer plant this species on our land. Likewise, ash is no longer included in our planting schemes. Other widespread diseases such as Sudden Oak Death Syndrome *Phytophthora ramorum* have the potential to massively transfigure our woodlands if and when they spread into the local area. Our response to this problem is to carefully select species for future planting works, identifying species and varieties with greater immunity to disease, including non-native species, but which still offer opportunities for biodiversity.

## PARTNERSHIP WORK

Key to the success of The Parks Trust's biodiversity work is strong partnerships. Among the many organisations we work closely with are The Environment Agency, The Forestry Commission, Natural England, Inland Drainage Board, local universities and numerous conservation groups and charities.

For example, we now have a very strong and mutually beneficial relationship with The Environment Agency. Together with them we have been carrying out various river restoration works on the Great Ouse and the Ouzel, primarily installing log deflectors to improve flows and creating spawning opportunities for fish. The Trust has been able to provide materials and manpower for these projects. The Floodplain Meadows Partnership (FMP), based at The Open University, have been able to offer practical advice and have also surveyed our floodplain meadows. The first survey in 2012 helped us identify which meadows to include in our Environmental Stewardship Scheme and the FMP carried

out a monitoring survey of these fields in 2015. The Trust is presently developing a partnership with Berks, Bucks and Oxon Wildlife Trust (BBOWT) with the aim of running joint projects, events and education programmes across Milton Keynes.

We have a Memorandum of Understanding (MoU) with the Buckinghamshire and River Ouzel Internal Drainage Board (IDB) whose drainage district covers a number of watercourses where The Trust is the riparian landowner. Under the MoU, The Trust and the IDB jointly plan the annual maintenance programme along these watercourses and manage the works to keep the watercourses operational for local drainage whilst mitigating the impact of those works on the landscape and biodiversity of our parks.

We work alongside Milton Keynes Council (MKC) and developers to advise and guide the design of newly areas of parkland and public open space to include opportunities for biodiversity.

There is a long-established link between The Parks Trust and Milton Keynes Natural History Society (MKNHS). MKNHS members carried out practical conservation and ecological monitoring in Howe Park Wood in the 1970s and 1980s and retain a special interest in this site. In recognition of this and the particular interest of its late member Bernard Frewin, the two organisations held the first Howe Park Wood Nature Day event in 2015. Society members make up the core of the Hazeley Wood Study Group which was set up in 1992 to monitor the changing plant and animal communities in this newly planted woodland. Society members include specialists in a wide range of taxa and are always keen to record on Parks Trust land. Similarly, members of North Bucks Bat Group and Bucks Bird Club have volunteered their services in monitoring programmes.

The Trust recognises the key role of the Buckinghamshire and Milton Keynes Local Nature Partnership in planning and coordinating action for biodiversity across our local area. Our membership will allow us to maintain links with the many statutory and voluntary organisations included in the partnership. The Trust is included in any opportunities and initiatives that are co-ordinated through the county-level partnership.

## REPORTING & REVIEWING

We will report our progress against our BAP targets to our Operations Committee and to our Ecology Advisory Group at least annually. A table listing the actions for each habitat and species action plan is set out in Appendix A. Our annual reports will be in a format based on this table.

The objectives and proposed actions in our BAP will be regularly reviewed. We will consider the results of habitat surveys and other information as it becomes available. New opportunities (or constraints) may also emerge and we will respond to these when they arise. The outcome of such reviews will be covered in the annual reports.

Our commitment is to review and re-publish our BAP out every five years.

## Generic Actions

### GENERIC ACTION THEME 1: PROPOSED ACTIVITIES AND PROCEDURES

- Implementation of a programme of ecological surveys, recording and monitoring, employing consultants, staff and volunteers.
- Maintain a data-sharing arrangement with Bucks and Milton Keynes Environmental Records Centre (BMERC)
- Further development of a biodiversity data management system within The Trust, linked to GIS system.
- Preparation of a habitat inventory with GIS map layer for Parks Trust land and water bodies. Using Phase 1 habitat inventory method through a combination of desk-based review of existing data, importing data through data sharing arrangements and targeted survey work.
- Continued development of data for species and features to enable the recorded locations and linked data to be displayed and accessed on GIS.
- Use the MapMate biological recording programme to record observations of wildlife in the Trust's parks and green spaces. The emphasis will be on recording local and national BAP species although common species will also be recorded to provide context.
- Consolidate links with local natural history and wildlife groups to share information and to facilitate and engage in volunteer-led recording schemes and projects on Trust land.
- Continue a programme of training for staff and volunteers in recording and using biodiversity data, including specialist survey/identification skills for priority habitats or species.

### SUMMARY OF PRIORITIES FOR DATA ON HABITATS AND SPECIES (AND PRIMARY METHOD)

- Preparation of 'Phase 1' Habitat Map/Inventory linked to the GIS (contract and staff)
- Preparation of Grassland Inventory (targeted surveys and condition assessments of semi-natural grasslands identified on the Habitat Map) (contract)
- Reedbeds (invertebrate survey – Walton Lake) (contract)
- Breeding Bird Surveys (contract/Bucks Bird Club)
- Woodland Vegetation Surveys (review against previous surveys and identify long term changes to ancient woodlands) (contract)
- Review of previous woodland Common Bird Census, drawing conclusions on change (contract)
- Saproxylic Beetles (ancient woodland sites) (contract)
- Butterfly Transects (staff/volunteers)
- Woodland Butterflies – Black Hairstreak and White Letter Hairstreak (staff/volunteers)
- Woodland Bats (monitor bat boxes at Shenley Wood, Howe Park Wood, Kingsmead Spinney, Linford Lakes Nature Reserve)
- Lakes (water quality monitoring) (contract)
- Lakes (review of fish stocking policy) (contract)
- Rivers (review of Environment Agency fisheries report) (staff)
- Grid Road Biodiversity assessment (to indicate biodiversity interest and identify how grid roads function as corridors between ancient woodland sites) (volunteer)
- Amphibians (contract, staff and volunteers) Monitor known populations of Great Crested Newt and other amphibian species. Where possible, develop survey skills in staff/volunteers and apply for newt licences in-house.
- Badgers – monitor known badger setts for signs of activity on regular, bi-annual basis (staff)
- Birds – monitor use of owl and kestrel nest boxes (contract)
- Water Voles – monitor stretches of watercourses for evidence of water vole (volunteers)

- Dragonflies – monitor key sites for Odonata and compare results with previous studies (volunteers)

## GENERIC ACTIONS THEME 2: WAYS OF WORKING

### WORKING PRACTICES AND PROCEDURES

Our landscape management operations are covered by a wide range of working practices and procedures. Many of these are geared to protecting wildlife, for example we avoid any works that could disturb roosting bats or nesting birds during the breeding season. These procedures and practices are integral to the way we work and regularly checked and reviewed to ensure we are complying with all relevant legislation whilst delivering our biodiversity conservation objectives.

The bulk of our landscape operations are carried out by contractors. Their works are closely monitored and supervised by our team of Landscape Officers. The contract specifications and schedules are reviewed each time a contract is retendered or extended, usually every six years. These regular reviews ensure that our contracted maintenance specifications and programmes take into account new information about biodiversity. We also have a direct works team who carry out operations such as tree thinning, coppicing and arboricultural works. The team has been trained in key skills, such as tree assessment for the presence of bats.

Approximately 300 hectares of our parkland is managed under an agricultural system (cattle and sheep) including extensive areas of grassland along the Ouse and Ouzel valley parks, Scheduled Ancient Monument (SAM) sites such as The Toot at Shenley and a large area of Campbell Park in the very centre of Milton Keynes. This system enables The Trust to manage the land for multiple objectives, including public access and amenity, landscape conservation, maintenance of floodplain grassland and biodiversity conservation. All of our livestock come under our own agricultural enterprise, which was established in 2007, whereby The Trust owns the livestock and these are managed for us through an operational agreement with a local farmer. The enterprise gives The Trust direct control over the land and the grazing levels, inputs and hay cutting regimes employed. It also provides a direct use for the hay cut from the grassland areas in sites where grazing is impractical. This way of working is fundamental to the delivery of our biodiversity objectives in the Meadows HAP.

### SITE MANAGEMENT STATEMENTS AND MANAGEMENT PLANS

We propose to prepare a set of management statements for our parks and open spaces and more detailed management plans for those sites of higher environmental value and complexity. The process of preparing these will ensure that we have considered all factors relevant to each site, including biodiversity, and that we have established a clear, balanced set of management objectives and priorities.

Site management statements will be a concise summary of how we intend to manage each defined area and what objectives we are seeking to achieve. They will contain an introduction to the site, a brief history and background, detailed maps, an outline of the factors of interest and any constraints, how the public access and use the site and a statement of our management objectives and proposed actions.

More detailed management plans will be prepared for a number of sites that are of higher value and potential for biodiversity. At the time of writing we have produced management plans for Linford Wood and Howe Park Wood SSSI. Our intention is to continue with Shenley Wood, thereby giving us a complete set of ancient woodland management plans and thereafter to focus on the grid roads and our major wetland/floodplain sites in the Ouse Valley Park.

## AGRI-ENVIRONMENT SCHEMES

In 2013 The Parks Trust entered into a combined Entry and Higher Level Environmental Stewardship Agreement with natural England, covering 250 hectares of land including 78 hectares in grassland management for biodiversity, for example the 'Restoration of species-rich semi-natural grassland option, and 51 of our ponds. We have also entered our ancient woodlands into Forestry Commission woodland management agreements. As well as providing grants to offset some of the costs of managing land, these schemes provide a framework for key elements of our work for biodiversity conservation.

## CASE STUDY – CREATION OF FLOODPLAIN FOREST NATURE RESERVE, OUSE VALLEY

The creation of the floodplain nature reserve at Manor Farm, Old Wolverton (within the wider Ouse Valley Park) is the largest and most ambitious habitat creation scheme The Parks Trust has undertaken. This section of the BAP looks at the background to this project and discusses the future development of the site following the completion of the post mineral extraction restoration scheme across most of the site in 2015 and as the habitats in the site begin to establish.

In the 1990s, The Parks Trust put together an ambitious plan to restore an area of floodplain woodland on what was agriculturally improved species-poor permanent pasture at Manor Farm. Under the adopted Minerals Local Plan, Milton Keynes Council was obliged to produce 17 per cent of the county's requirement of aggregates from within the Unitary Authority and the deposits of sand and gravel at this site made it a prime site for quarrying. Mike Street, then Conservation Officer at The Parks Trust, saw the opportunity of the need for aggregates as a means to create a new biodiverse habitat through a scheme far exceeding a typical gravel pit restoration model. A visit to the Oostvaardersplassen wetland nature reserve in The Netherlands convinced Mike and his colleagues that a similar wetland complex could be created in Milton Keynes.

Where it still exists, temperate floodplain forest is the richest natural system in Western Europe. In prehistory, this would have been the typical landscape type in English river valleys. They were generally lightly wooded and had a rich mosaic of natural habitats including fens, marshes, reed-beds, meadows, wet woodland, ponds, woodland glades, seasonally flowing braided channels, shingle bars, earth cliffs and more. In turn, this diversity of habitats would have supported a huge variety of biodiversity being especially rich in plants, invertebrates and bird species. However, as early as the Bronze Age, virtually all of this habitat had been lost, as riverine forests were clear felled for settlement and agriculture.

Integral to the project was the decision that all royalties from the sale of the aggregates would come to The Parks Trust and that this money would fund the restoration work and provide an endowment for the ongoing maintenance of the site. The quarry area held an estimated 700,000 tonnes of aggregates and the work was forecast to last for seven to 10 years. The aggregates company chosen to carry out the work was Hanson UK Ltd, largely due to their excellent track record in restoring former gravel workings for biodiversity in Britain and abroad.

Following a period of public consultation, planning consent was eventually granted in 2004. The area identified for mineral extraction was 34.3 hectares in size comprising fields between the River Great Ouse and the Back Brook at Manor Farm. A key factor in the project's favour was that the popular riverside walk between the Grand Union Canal and Haversham Road would be retained throughout the lifetime of the project. Access through the fields above the quarry site could similarly be retained, with just one footpath needing to be diverted to allow vehicular access to the quarry site. To reduce disturbance to Cosgrove Caravan Park to the north of Manor Farm, temporary earth bunds were created. These also had the effect of screening off the work site from the riverside footpath and thus reducing noise.

The creation of this site would also make a major contribution to flood relief in the local area. The removal of the minerals created approximately 460,000 cubic metres flood capacity on site, resulting in a three per cent reduction in peak flow for approximately 12 kilometres downstream. This would also mean that flood peaks would be delayed by several days making storm effects less severe. Since New Bradwell and Newport Pagnell were historically affected by seasonal flooding, the potential benefits of this increased capacity to the local population are obvious.

## PUBLIC CONSULTATION

When The Parks Trust announced its plans to allow mineral extraction at Manor Farm, there was initially strong opposition in the Old Wolverton area. The general view in opposition to the plans was that this would see considerable disturbance to an area of parkland that local residents had enjoyed for generations and there were fears that the restoration would result in little more than 'large muddy puddles' with a net loss of public access. A local community group, Wolverton Against Mining (WAM), was particularly vocal in its criticism of the project and consultation with this group and the wider public was crucial from an early stage. Another chief concern was the anticipated increase in traffic, with movements of HGVs through Old Wolverton. Fears that the increased levels of traffic would be unacceptably high were largely quelled with the number of vehicle movements per day limited to 26.

In 1996, Milton Keynes Library housed a public exhibition promoting the development. The project was also discussed in some detail in the Trust's newsletters of 1996 and 1997 which went out to thousands of households across Milton Keynes.

In 2007, the Manor Farm Liaison Group was established, bringing together representatives of all the major stakeholders including The Parks Trust, Hanson, Milton Keynes Council, South Northants Council, local parish councils, Milton Keynes Natural History Society and local residents. This group met at regular intervals during the life span of the mineral extraction to review progress and discuss any concerns as and when they arose.

Mineral extraction finally began in August 2007. In the first winter of the operation, heavy rainfall meant that there was a hiatus of several months whilst Hanson waited for the site to dry out sufficiently to resume work. Repeated periods of heavy rainfall during the following winters and again in spring/early summer 2012 further extended the project timescale.

Within the first two years of the minerals operation, wading birds had begun to nest on the newly formed islands and peninsulars. Lapwing *Vanellus vanellus* were most numerous with lower numbers of Redshank *Tringa totanus*, Ringed Plover *Charadrius hiaticula*, Little Ringed Plover *C. dubius* and Oystercatcher *Haematopus ostralegus*. Common Tern *Sterna hirundo*, which has declined as a breeding species locally and nationally, began to nest in 2011 and the colony has since grown to approximately 20 nesting pairs. Many other waders visit the site on spring and autumn passage with Green Sandpiper, Common Sandpiper, Common Snipe, Curlew, Black Tailed Godwit and Golden Plover among the most regular. Rarer visitors include Avocet, Pectoral Sandpiper and Little Stint. Yellow Wagtails *Motacilla flava* are frequently seen in the spring and may breed in the future. Although no formal monitoring of the animal life has been undertaken thus far, Noctule Bats *Nyctalus noctula* are seen flying high over the pools in summer and a variety of dragonflies and butterflies have been noted.

In 2012, The Parks Trust created some channels through the large reed bed at Walton Lake in Ouzel Valley Park and a large quantity of Common Reed *Phragmites communis* was translocated to the Manor Farm site. The reed was introduced towards the western end of the site with large stands simply being placed at the water's edge. The reed was not fixed in place or fenced off from grazing geese or other animals. Shortly afterwards, spring floods inundated the site and much of the reed was moved from its initial planting site and moved around the system. However, several reed beds have now established and further reed planting is imminent.

In 2013 it was noticed that the muddy margins of water bodies in the western half of the complex held New Zealand pygmyweed *Crassula helmsii*. This is one of the most invasive aquatic plants known, forming dense carpets in the margins of lakes and sometimes completely taking over the water column of ponds and lakes. *Crassula* is known to be moved between wetlands by birds and small fragments can survive on bird's feet, but can also be moved by machinery and personal equipment. An initial chemical treatment of the plant over two to three days in October 2014 appeared to be unsuccessful and our ongoing management of *Crassula* at this site will be a great challenge. It is crucial that proper biosecurity measures are taken when operating on site, and that all machinery, clothing and equipment are thoroughly cleansed before being used in any other water bodies.

In March 2015, 100 Black Poplar cuttings were planted at the eastern end of the site. These cuttings were provided by Aylesbury Vale District Council and comprised 28 of the known clones of this very rare tree species. Over 20 of those planted were female plants, which are extremely rare in the wild. Several other areas towards the western end of the site have also been identified for planting with black poplar.

Among the tree species planted in 2011 are Oak, Ash, Field Maple, Dogwood and Alder. Future plantings will consist mainly of Birch and Alder representing the wet woodland types most likely to thrive in the Floodplain Forest.

The installation of the public access features finally commenced in October 2015. Initially, a series of links into the nature reserve were installed connecting it to existing leisure routes to the north (along the course of the Great Ouse) and the south (through the grazing land of Manor Farm). As well as creating some 2.5km of footpath, the build also included seven boardwalks over spillways, the construction of new stock proof fences and the installation of three high quality wildlife viewing hides. Once the build is complete, in spring 2016, further habitat works will be undertaken including the planting of a wet woodland tree mix and the creation of new reed beds. A Management Plan for Floodplain Forest will be produced in 2018 to guide The Trust's ongoing management and development of this site.

## CONSERVATION GRAZING

The introduction of grazing livestock will help to maintain a variety of habitats within the site, in particular to keep areas of open grassland and short vegetation amongst blocks of scrub and woodland. The objective of this grazing would be conservation management of the habitat, replicating the natural effect of animals such as red deer and aurochs (wild cattle) that existed and grazed in the prehistoric floodplain landscape. Rather than introducing cattle or sheep, which the Parks Trust uses to graze its agricultural grasslands and meadows, ponies are generally considered one of the most effective animals in wetland ecosystems. Konik ponies, a breed closely related to now extinct wild horses that once roamed across Europe, are particularly hardy in wet conditions and have several adaptations to wet ground conditions, most notably self-trimming hooves. Koniks are very placid in nature and less likely to be alarmed by barking dogs, for example, than are cattle. They will change their diet throughout the year, generally favouring grasses in the summer and switching to coarser vegetation such as sedges and reeds in the autumn. There is also evidence that the dung of ponies supports a greater diversity of insect than that of cattle.

Parks Trust staff visited the National Trust's Wicken Fen Nature Reserve in Cambridgeshire in early 2016 to see how reserve staff use Koniks and Highland cattle to graze the reserve. Here, the ponies have helped create a very diverse patchwork of vegetation and habitat types. The National Trust would be able to sell some Koniks to The Parks Trust in the near future, bringing the original vision of introducing these charismatic animals to the floodplain forest landscape to fruition.

## ECOLOGICAL MONITORING

Monitoring the ecological and environmental changes at this site is of the highest importance. Hydrological data will be captured partly from the Environment Agency's gauging station situated nearby and also from data-loggers installed on site. We will work with colleagues at Cranfield University to monitor these and other environmental data.

Recording programmes will be devised for various different plant and animal groups. These will include plant quadrats, butterfly and dragonfly transects, bat recording and breeding bird surveys – conducted by local birdwatchers with an in-depth knowledge of the site. Since this is the first project of its kind in England, detailed recording of the colonisation of plants and animals here could be of key importance in the future, as and when similar habitat creation projects are undertaken.

## LANDSCAPE SCALE CONSERVATION IN MILTON KEYNES

It is widely recognised that our countryside and associated wildlife is under ever growing pressure from urban development and change in agricultural practices. In parallel to this, populations of many of our most threatened species have become increasingly isolated and therefore vulnerable with huge tracts of unsuitable or even hostile land use between one site and the next. It was against this background that Professor Sir John Lawton's Report 'Making Space for Nature: a review of England's wildlife sites and ecological networks' was produced in 2011.

The key finding of the Lawton Report was that the historic emphasis of wildlife conservation on nature reserve and protected area management for wildlife, whilst important, was failing to halt the decline in wildlife. The Report concluded that we need to make our national network of wildlife habitats in the UK "bigger, better and more joined up" to maximise the opportunities for the recovery of biodiversity. The landscape of Milton Keynes has altered fundamentally in the 50 years since the new town was designated. Creating a green city was one of the fundamental principles of the city design and this resulted in a landscape that benefits from a relatively high proportion of green space, much of which is linked along the linear parks and grid road corridors that are now in the Trust's care. Having so much of the city's green network in the Trust's care already enables us to work at a local landscape scale. For example, much of The Trust's parkland follows linear features, for example the Loughton and Broughton brooks and the two main river valleys. These are sizeable areas of relatively contiguous good wildlife habitat which benefits many species.

However, even in Milton Keynes, habitat fragmentation and restricted movement between sites affects many species. Barriers to dispersal and movement include the grid roads, areas of housing, industrial estates and the associated infrastructure. The ecological connectivity of the linear park network is broken in places too. For example, Ouzel Valley Park in the east of the city extends south from Willen Lake as far as Simpson and South Caldecote Lake. But Waterhall Park, which is home to declining species as diverse as Barn Owl and Meadow Saxifrage, is effectively fragmented from very similar floodplain grassland to the north by an area of development land south of the A5, as well as sports fields and gardens.

Our three areas of ancient woodland are locally important for their plant and animal communities and support declining species including Herb-Paris, Marsh Tit and Black Hairstreak. However, since the 1970s the land in between these woodlands which was largely farmland has mostly been developed for housing or industry. Although we lack much hard data, this development must have had a profound negative impact on the biodiversity in the woods themselves (from increased human disturbance) and crucially, in population movement and genetic exchange between the woodlands, and between them and other areas of habitat.

In the case of the very rare Black Hairstreak, a butterfly which depends on just one larval food-plant, blackthorn, such habitat fragmentation can be terminal. On Trust land, this insect is restricted to Howe Park Wood SSSI where it remains very vulnerable. A population on the southern edge of the wood which persisted for many decades appears to have been lost and there remains one, very small population on the northern edge of the wood, utilising an area of blackthorn scrub less than one hundred metres in length. The next good potential habitat for the butterfly is along the North Bucks Way footpath which is approximately 1km west of the woodland. A few individuals have recently been observed at Oxley Mead SSSI (not currently owned by The Parks Trust) but this too may be a small and isolated population. The Parks Trust aims to plant up the 'gap' between Howe Park Wood and the North Bucks Way to facilitate the dispersal of the butterfly from the woodland into the surrounding landscape with the ultimate aim of connecting these two disparate populations. Of course, this would not only benefit Black Hairstreak but also a great variety of other invertebrates, mammals and birds which could migrate along this new corridor or even nest in it.

A current high-profile conservation issue in the UK is the ongoing decline of our bumblebees, together with many other insect pollinators. In fact, over 250 insect pollinators are in danger of extinction in the UK (Buglife, 2015) but it is bees which have captured the public imagination, largely due to their well-known role in pollinating crops and domestic flowers. Of all our wildlife habitats, wild flower meadows have been hardest hit with a 97 per cent decline since World War II and the effects of this include the extinction of two bumblebee species and steep declines in most of the other species. The charity Buglife

has come up with a landscape scale initiative to try and reverse these declines, the B-lines Project. This ambitious project aims to create a network of bee-friendly corridors, 3km wide stretches of landscape with at least 10 per cent cover of wildflower rich grassland. Already B-line networks have been established in the north of England and in London and the south-east with the ultimate aim to connect all of the B-line areas together, allowing all pollinators to move more easily through the English countryside. The Parks Trust has taken part in discussions with Buglife and other stakeholders to help influence the plotting of B-lines in Buckinghamshire and Milton Keynes.

The provision of more wildflower rich grassland was an objective of our previous Biodiversity Action Plan and since 2010 we have amended mowing and grazing regimes in many areas, including managing more areas under a hay-cropping regime and switching areas of pasture into a hay meadow with aftermath grazing regime. However, there are opportunities to create more areas of suitable habitat for pollinators. The Parks Trust is responsible for some 180km of grid road landscape, much of it in the form of tree plantations with adjoining strips of mown grassland. Although the biodiversity of the grid road landscape is little studied, much of the roadside grassland is currently too regularly cut to offer sufficient nectar and cover for many insects. The Trust will identify more areas of the grid road landscape which can be enriched with wildflowers, possibly using green hay from some of our existing meadows and will seek to take cuts off these grasslands much later in the year so that bees can complete their life cycle and flowers can set seed. This will result in a greatly improved green network for pollinating insects as well as better conditions for small mammals.

In the Ouse Valley Park our recent acquisition of Linford Lakes Nature Reserve and the development of the Floodplain Forest at Manor Farm considerably increases the amount of wetland habitat managed by The Trust in the valley. The extension of the Manor Farm minerals extraction at New Bradwell, which will see the pits restored primarily as lakes and marshland for wading birds, offers a further opportunity for biodiversity. In 2016 we acquired Stanton Low Park and an area of riverine scrub and woodland known as Joan's Piece, further increasing our landholding in the Ouse Valley. These acquisitions and habitat creation initiatives, along with our longer established sites such as the Stony Stratford Nature Reserve are all part of our strategic approach to enhance the biodiversity of the valley at a local landscape scale. With all of these sites managed appropriately, this stretch of the Ouse Valley will offer better and better habitat for wetland birds, bats and floodplain plants, for example, all in accordance with the objectives of the Ouse Valley Biodiversity Opportunity Area (BOA) in the Buckinghamshire and Milton Keynes Biodiversity Action Plan.

Inevitably, wildlife conservation at the landscape scale relies on numerous bodies and landowners working to a common aim. We already work in partnership with The Environment Agency, The Inland Drainage Board and The Floodplain Meadows Partnership to ensure best practice in our land and waterways management. Our aim is to work with more landowners and bodies including Milton Keynes Council and other developers to encourage and deliver meaningful landscape scale conservation in Milton Keynes. Among other things, this will involve seeking to shape and influence how Milton Keynes continues to grow and develop. Milton Keynes Council is currently preparing its replacement Local Plan, Plan:MK, which includes completing a projected housing requirement of 35,000 dwellings in the period 2011 to 2031 plus all of the associated infrastructure and employment development. This increased and extended development could present further risks to existing habitats and fragmentation of sites. Our aim is to seek to guide and influence the planning process to reduce these risks and where possible to realise opportunities of retaining and enhancing wildlife corridors.

One of the major infrastructure projects planned to support growth and development is the proposed restoration of the East-West railway line. The course of this line runs through areas which are regionally important for butterflies and reptiles, particularly at Salden to the south-west of Milton Keynes. Network Rail is looking to fund some wildlife habitat creation schemes in Milton Keynes to offset the loss of these sites with the overall aim of net biodiversity gain. This could potentially facilitate several of the landscape-scale projects mentioned above.

## ACTION PLANS – AN INTRODUCTORY NOTE

The Parks Trust's original Biodiversity Action Plan (BAP) produced in 2010 contained 10 Habitat Action Plans (HAPs) and 15 Species Action Plans (SAPs). This revised BAP contains two new Habitat Action Plans bringing the total to 12. Two more Species Action Plans have been included, however the number of SAPs remains at 15.

Where the original BAP had separate SAPs for Grass Snake, Slow Worm and Common Lizard, these have now been condensed into SAP 08 – Reptiles, since the habitat requirements and management advice for these species is broadly uniform. SAP 07 Great Crested Newt has been expanded to cover all native amphibian species. SAP15 was previously for Noctule Bats but has now been amended to cover all bat species and retitled accordingly (SAP14 – Bats).

# Habitat Action Plan

## HAP01 – ANCIENT SEMI-NATURAL WOODLANDS



### STATUS

UK BAP: Priority Habitat – Lowland Mixed Deciduous Woodland

### NATIONAL STATUS

In decline. Approximately 50 per cent of the ancient semi-natural woodlands that existed in Great Britain before the 1930s have since been cleared or changed into plantations (JNCC). Of the 11.5 per cent of Great Britain's area that is under woodland only 1.5 per cent is ancient semi-natural woodland.

### LOCAL STATUS

The Parks Trust owns and managed three areas of ancient semi-natural woodland in Milton Keynes. These are Shenley Wood (25 hectares), Howe Park Wood (25 hectares) and Linford Wood (39 hectares). In addition, it has several smaller areas viz. Kingsmead Spinney, a small unnamed piece consolidated into the H7 Grid Road landscaping at Westcroft and a 50m wide strip of the ancient (now largely plantation) Oakhill Wood at Woodhill.

### ECOLOGY & ISSUES

Ancient semi-natural woodlands are defined as woods which can be shown to have existed since at least 1600 and which retain primarily their local and native naturally occurring species. Some of these woods may occupy sites that have been continually covered with trees since prehistoric times, providing a direct link back to natural forests that colonised most of the UK following the last Ice Age.

For many centuries these woodlands were managed as a source of timber, underwood, firewood, pasture or 'pannage' for livestock, game cover etc. Management practices utilised the naturally occurring species – hence the term 'semi-natural' – and regular coppice cycles of activities such as coppicing carried out over centuries greatly influenced the ecological diversity of the semi-natural woodland habitat.

Following the industrial revolution, the supply of and demand for different materials for fuel, manufacturing and construction saw a decline in traditional woodland management and by the 1950s management had all but ceased in many ancient woods. This dereliction saw the woods become much darker, shadier places which in turn led to a significant decline in biodiversity. In other cases, the national policy to produce alternative types of fast growing timber during the twentieth century led to the conversion of ancient woodlands to plantations of conifer and other non-native woodlands.

With the ancient woodlands now being surrounded by development and becoming increasingly popular for visiting there is growing concern about the impact of uncontrolled dog walking on the ecology of the woods, primarily the disturbance caused by dogs running off lead through the undergrowth away from the paths and rides. This is likely to be disturbing birds and small mammals and the ponds in the wood have become degraded as a result of dogs repeatedly entering them and stirring up sediments. A proposed way to mitigate this impact whilst still encouraging people to visit and enjoy the woodlands is to introduce a 'dogs on leads' policy at least during the spring and summer months.

The ancient woodlands that remain today still support a diverse range of flora and fauna including many species that are rare or threatened. Many fungi, plants and invertebrates are found only in ancient woodland sites. National forestry policy now recognises the ecological, historic and social value of these woodlands and the overriding policy now is to protect them and to reintroduce traditional management practices such as coppice with standards. Many plantations are being restored to semi-natural woodland.

All of the ancient woodlands in Milton Keynes are classified as National Vegetation Classification (NVC) type W8 Ash/Maple/Dog's Mercury woodland. They contain a number of species of botanical interest including orchids, Herb Paris and Wood Anemone. All of these species are classified as ancient woodland indicators as they are primarily found only in that habitat and have very limited powers of dispersal.

One of the most important ecological components of ancient woodlands is sheltered, open areas within the stands of trees (glades, rides and pathways) and along woodland edges. These are areas where increased light levels allow a diverse ground flora to establish which in turn benefits many species of pollinating insects and other invertebrate life. Vegetation surveys (especially in Linford Wood) have shown that 80 per cent of all woodland field layer species are found in the three to four-metre-wide zones either side of rides and the conservation of this habitat depends upon the regular cutting, thinning and coppicing regimes that have been carried out by The Trust.

A key factor affecting the make-up of ancient woodland and the associated flora is the hydrology of the underlying soils, which can be affected by surrounding development. Recent botanical survey works seems to support the belief that our woodland sites are gradually drying out, with some plant species towards the wet end of the W8 classification spectrum fairing less well than more dry-tolerant species (a number of seasonal woodland ponds have totally dried out in recent years). There is a general concern that a slow drying-out of the substrata around and beneath our woodlands may have a long term and significant detrimental effect on the woodland ecology. In an effort to counter this drying out, The Trust is reviewing its ditch management in its woodlands, with less intensive ditch clearance and even part-blocking ditches in some instances to retain water within the woodlands.

The importance of the deadwood resource – and in particular standing deadwood – has been recognised nationally in recent decades. The Parks Trust seeks to leave as many wood pile habitats, including hibernation piles for amphibians and reptiles, as possible. Creating standing deadwood habitat, by ring barking selecting trees, and simply retaining dead trees where they do not present any danger to public safety, vastly increases the available habitat for a great variety of beetles, moths and other invertebrates.

The emergence and rapid spread of a number of tree pathogens, most notably Ash Dieback and Sudden Oak Death, poses a very serious threat to our native woodlands. The Parks Trust plans to develop a strategy to address this, seeking alternative timber species to replant our woodlands as necessary. Growing on our own oak saplings, from acorns collected in our ancient woodlands, is already underway.

The ancient semi-natural woodlands of Milton Keynes have been subject to more ecological studies than any other habitat type owned by The Parks Trust. MK Development Corporation carried out many studies (the first being in Linford Wood in 1978) and The Trust has continued to undertake further studies.

## CONSERVATION MANAGEMENT OBJECTIVES

- To maintain The Trust's ancient semi-natural woodlands in overall favourable condition for biodiversity conservation.
- To enhance the overall quality and diversity of the ancient semi-natural woodland habitat.
- To conserve and increase populations of species associated with the habitat.
- Summary of key measures and indicators.
- Natural England's condition assessment of Howe Park Wood SSSI (current status = favourable).
- Annual recording and reporting on management works undertaken within the woodlands towards achieving our objectives.
- Analysis of the results of the ecological surveys and monitoring and comparison against previous surveys/baseline data.

## RECENT ACTIVITIES

- Ongoing conservation management activities including coppicing, thinning and ride/glade management.
- Publication of Management Plans for Linford Wood (2014) and Howe Park Wood SSSI (2015).
- Bat Monitoring Programme established for Shenley Wood, Howe Park Wood and Kingsmead Spinney.
- Ground Flora Survey of Linford Wood (BSG Ecology 2015).
- Butterfly Transects established for Howe Park Wood and Oakhill Wood.
- Improved management of blackthorn scrub in Howe Park Wood.
- Collection of acorns and growing on of young oak saplings for planting out in woodlands.
- Introduction of 'dogs on leads' policy in Howe Park, Shenley and Linford Woods during bird nesting season (March-August).

## PROPOSED ACTIVITIES

- Produce a management plan for Shenley Wood (2016).
- Conduct ground flora surveys in Howe Park Wood and Shenley Wood, with an emphasis on testing environmental factors such as hydrology and atmospheric nitrogen (2016/2017).
- Continue to increase the standing and fallen deadwood resource in all our ancient semi-natural woodlands.
- Closely monitor the spread of Ash Dieback and other tree pathogens in our woodlands. Develop a strategy to counter the expected loss of mature ash trees.
- Repeat 1996 survey of Saproxylic beetles across Howe Park, Shenley and Linford Woods (2016).

## LEGAL PROTECTION

Howe Park Wood is designated as a Site of Scientific Interest (SSSI). SSSIs are legally protected under the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities Act 2006. They are subject to condition reports by Natural England.

# Habitat Action Plan

## HAP02 – PLANTATION & PLANTED WOODLANDS



### STATUS

**UK BAP:** Priority Habitat – Lowland Mixed Deciduous Woodland

### NATIONAL STATUS

Increasing.

Tree plantations have increased the woodland cover of the UK by over eight per cent since the nineteenth century. Much of this planting was undertaken primarily to produce timber, and much of the UK's resource of plantation woodland consists of coniferous species originating from the western seaboard of North America including such species as Sitka spruce and Douglas fir. Many plantations have been created to provide visual amenity or landscape screening such as those that have taken place along motorways and major road schemes since the 1960s. Such schemes tended to make more use of broadleaved trees, although often with non-native species e.g. Norway maple and Italian alder and little consideration was given to creating new woodlands with a more 'natural' English woodland character. It is only more recently that the objective of planting new woodlands with a more naturalistic character, using locally native species and stock of local provenance, has become prevalent in woodland creation schemes.

## LOCAL STATUS

Milton Keynes has substantial areas of mainly broadleaved plantation and planted woodland, most of which are in the ownership of The Parks Trust. There are approximately 350 hectares of woodland and 200 hectares of associated shrubbery under The Trust's current ownership. Much of this new woodland is located in the landscaped zones of the Transportation Corridor system (the 'V' and 'H' grid roads) and these have become the major visual, structural element of Milton Keynes largely fulfilling the original planning vision of creating a 'City of Trees'.

Most of the planting was carried out for the primary purpose of visual amenity or providing landscape value but some plantings have semi-commercial objectives. For example, cricket bat willow plantations are commonly found in the river valley parks; and Hazeley Wood was planted with one objective being the production of veneer quality oak on a 150-year rotation.

## ECOLOGY & ISSUES

Plantations, planted and secondary woodlands are not generally very ecologically diverse in comparison with long established semi-natural woodlands. Indeed, poorly located plantings can have a detrimental effect on the diversity and ecological value of other habitats. For example:

- Plantations containing exotic and non-native species such as sycamore and Norway maple can damage un-enriched ancient woodland if these invasive species are allowed to set seed in older habitat.
- New planting located immediately adjacent to species rich old hedgerows can shade out the hedgerow and associated field layer species.
- Establishment of woodland plantations on areas of old, long established grassland has a negative effect on the habitat and leads to rapid loss of species like skylark and the long-term losses of many species of butterfly and moth.

Even areas of secondary woodland which are 150 years old have a paucity in their overall biodiversity compared with that found in ancient woodland. Given sufficient time and appropriate management, secondary woodland may develop a diverse ecology, but this may take hundreds of years. Perhaps the best approach is to manage the woodland edge – often the most important area for invertebrate diversity – sympathetically, allowing a graded edge or 'ecotone' between woodland and long grass. This should particularly benefit invertebrate groups such as beetles and spiders.

In Milton Keynes the oldest 'new city' plantings are around 40 years old and the majority less than 30 years old, therefore the biodiversity is limited. In order to stimulate and speed the progression from plantation to well-structured deciduous woodland the following measures have been taken:

- Following establishment or canopy closure many areas have been seeded with a field layer seed mix appropriate to that found in the field layer of NVC W8 ancient semi-natural woodland (which is the dominant woodland NVC type in Milton Keynes). To date over 120 hectares of woodland plantations have been treated in this way. These areas are particularly noticeable in the spring when the flowering of species such as primrose, bluebell and wood anemone produces a significant visual amenity.
- The intensive thinning of new plantations aiming to create a 'coppice with standards' type of silvicultural system where mixed age groups of shrubs and trees are represented.
- Favouring native species over non-native species during thinning operations.
- Leaving some larger sized felled timber on site in order to build the deadwood resource.

- Identifying areas where the trees and shrubs from nearby hedgerows have seeded into areas of new plantation and favouring this natural regenerated material during thinning and coppicing operations.

## CONSERVATION MANAGEMENT OBJECTIVES

- To maintain and enhance structural diversity within the planted woodlands owned by The Parks Trust.
- To produce planted woodlands that resemble NVC W8 semi-natural woodland, particularly W8a *Primula vulgaris* and *Glechoma hederacea* sub-community with small areas of other types such as W22b *Viola riviniana* and *Veronica chamaedrys* sub-community.

## SUMMARY OF KEY MEASURES AND INDICATORS

- Management assessments of planted woodland structure and annual reporting on management works undertaken.
- Observations and recording of the results of actions to increase the species diversity of ground flora in our woodlands.
- Development of visible understorey or shrub layer in grid road plantations which are currently lacking this important habitat component.

# Habitat Action Plan

## HAP03 – SCRUB



### STATUS

**UK BAP:** None. Scrub is not included as a priority habitat within the UK BAP. However, it is an important component in many other habitats such as Ancient Woodland, Lowland Calcareous Grassland and River Valleys.

### LOCAL STATUS

There is both naturally occurring and planted scrub within the Milton Keynes area. It occurs as a minor component of other habitats but there are some relatively substantial areas where scrub is the dominant habitat feature. Good examples of planted scrub are located at Elfield Park and the areas surrounding Walton Lake. Large naturally occurring (or naturally regenerated) areas of scrub are found along and adjacent to North Bucks Way and at Bradwell Abbey. In addition, islands such as those at Willen Lake and Furzton Lake offer mature scrub. An elevated scrubby bank at Railway Triangle, Blue Bridge supports perhaps the most important reptile population in Milton Keynes. Linford Lakes Nature Reserve, bought by The Trust in 2015, has extensive areas of scrubby grassland which are rich in birdlife.

### ECOLOGY & ISSUES

For the purposes of this Biodiversity Action Plan scrub is defined as an area where woody shrub species make up a significant or dominant component of the overall habitat. This can range from an area of scattered bushes in rough grassland to closed canopy shrub vegetation (thickets). The

description includes areas of locally native and non-native shrub species including sub-shrubs (e.g. bramble) and tree saplings less than 5m tall.

Hawthorn scrub is associated with many nesting birds including migrant warblers and nightingales. During the winter, scrub is important for feeding birds such as starlings, thrushes, finches and buntings. Queens of some bumblebee species will hibernate in scrub over winter and on emergence may utilise the scrub for their nests. Mature blackthorn stands along woodland rides and at field edges are the preferred egg laying sites for the very rare Black Hairstreak butterfly. Elder scrub is associated with badgers. Badgers use elder both for cover and as a food source and their excavations and droppings help elder to germinate and spread. Pockets of scrub in more open, grassy habitats also offer important shelter for species as diverse as butterflies, bush-crickets and reptiles.

Scrub does need to be managed to retain its wildlife value. Its overdevelopment can have detrimental effects eventually resulting into an even-aged enclosed canopy environment. Many species of butterfly and moth do well in a mosaic landscape of open, herb-rich grass dotted with pockets of scrub but once the scrub dominates and shades out the flowers, these species can quickly disappear.

Broadly, the most valuable scrub habitats are those which are structurally diverse and managed to prevent the development of homogenous, even-aged blocks composed of a few dominant species. Scrub often forms an important ecotone between open semi-natural grassland and woodland, an important habitat for plants, invertebrates, birds and mammals.

## CONSERVATION MANAGEMENT OBJECTIVES

To create and maintain a diversity and range of successional scrub habitats across the Parks Trust's landholding, comprising:

- Grassland/scrub transitional complexes ranging from open managed grassland with occasional scattered shrubs through to dense scrub thickets.
- Transitional scrub zones adjoining and within existing woodlands, particularly close to open sunny glades.
- Blocks of scrub and dense thickets beside main watercourses.
- Areas comprising groups/patches of scrub of differing age set in sheltered, rough irregularly-managed grassland.

## RECENT ACTIVITIES

- Thinning out of <20 per cent of shrubs at Elfield Park to create a mosaic landscape of scrub and open grassland/bare ground.
- Planting up of gorse scrub habitat on the slope of the H4 at Lodge Lake to create additional nesting habitat for birds.
- Active management of scrubby grassland at Bancroft and Hills and Hollows in Loughton Valley Park.
- Management of scrub at 'Railway Triangle', Blue Bridge to favour reptiles and invertebrates.
- Rotational management of osier and hawthorn scrub at Linford Lakes Nature Reserve.

## PROPOSED ACTIVITIES

- Clear an area of scrub at Elfield Park and seed with kidney vetch to create optimum habitat conditions for Small Blue butterfly.
- Targeted management of scrub around the margins of Walton Lake.
- Further bashing of over-mature stands of scrub at various points along the North Bucks Way to create open coupes and to alter the age structure of the habitat.

- Retention of large stands of bramble along North Bucks Way and between North Bucks Way and Shenley Wood as these are used by nectaring butterflies such as White Admiral and Silver Washed Fritillary.

## Habitat Action Plan

### HAP04 – PARKLAND AND AGRICULTURAL HEDGEROWS



#### STATUS

**UK BAP:** Priority Habitat

#### NATIONAL STATUS

In decline.

The length of managed hedgerows decreased by 6.1 per cent between 1998 and 2007 in England: most were undermanaged and many had become relict hedgerows or lines of larger trees (Countryside Survey 2007). Hedgerows are an important habitat for many species in the countryside and large towns providing shelter and links between fragmented zones of semi-natural habitat. Species-rich hedgerows are defined as those which contain five or more native woody species on average in a 30-metre stretch.

#### LOCAL STATUS

The number and length of hedgerows across Milton Keynes has significantly declined over the past 50 years as the new town was developed. A contributory factor to the removal of many hedgerows was the fact that they were predominantly composed of elm and had succumbed to Dutch elm disease before development was proposed. The new town planners did not see these poorly stocked,

degraded hedgerows as significant landscape features and there was no attempt to conserve them in the development frameworks.

In contrast to degraded elm-dominated hedges, those that were well-stocked and in good condition in the pre-development landscape were often protected and incorporated within new developments, frequently as garden boundary hedges. However, the change of use of the surrounding environment negated much of the ecological value of these retained hedgerows; in some cases they were regarded as untidy in the new built environment, became prone to the dumping of garden waste or rubble or were removed by householders and replaced with fences or with evergreen species such as Leyland cypress.

The majority of pre-existing agricultural hedgerows in what became the linear parks were retained; in addition many pieces of remnant hedgerow were retained within the grid road landscape. Unfortunately, much new planting was implemented very close to these hedgerows or remnants and the growth of trees has shaded them out. A lack of hedge-laying or other appropriate management over time has resulted in many of these hedgerows becoming 'gappy' and thus reduced in value for biodiversity.

Two early ecological studies (1977 and 1979) were carried out on the hedgerows within the designated area of Milton Keynes and provide valuable evidence on dating. One of the finest examples of an ancient hedgerow is the Secklow hedgerow which runs through the wooded southern edge of Campbell Park. Comprised mainly of hawthorn, blackthorn and elder, this hedge features good quantities of deadwood and shows signs of pleaching (hedge-laying) over hundreds of years.

A network of hedgerows extends across the Milton Keynes Expansion Areas, particularly the Western Expansion Area where hedgerows are a dominant feature in the agricultural pre-development landscape. As these areas are being developed, sections of the hedgerow network are being retained for ecology reasons, although the overall ecological value of this network will inevitably be degraded as sections are removed and the remaining sections become isolated and surrounded by houses and other buildings. The Parks Trust will seek to adopt these retained hedgerows from developers (where offered) and will thereafter employ appropriate management to optimise the ecological value of these remnant features of the pre-development landscape.

## ECOLOGY & ISSUES

Hedgerows are recognised as one of the most important habitats for the dispersal of a variety of wildlife and function well as 'green corridors'. Factors affecting the health and biodiversity of hedgerows include the age and species diversity of the hedgerow; the timing and frequency of cutting and the impact this has on the height, width and structure; whether there is a lack of maintenance or neglect; and the impact of adjoining land use including grazing or urban development. The overall continuity between hedgerows within a network and their linkage with other habitats are also important factors particularly in allowing the movement of many species such as bats and other small mammals and many bird species.

Among the most obvious of hedgerow species are song birds. Numerous species, including Dunnock, Blackbird and Common and Lesser Whitethroats are more or less dependent on dense hedgerows for nesting sites and many other Warblers, Thrushes and Finches use them for forage and dispersal. Inappropriate management of hedgerows, including flailing in late summer when birds may still be nesting, has been blamed for the declines for species such as Yellowhammer and Reed Bunting. Best practice dictates that flailing should be carried out in late winter (February) to ensure a crop of berries for winter forage and before the nesting season commences.

The presence of occasional trees within a hedgerow is important. Hedgerow trees provide additional shelter, shade and bird nesting and bat roosting opportunities as well as song posts. Ancient trees and deadwood within hedgerows provide habitat for saproxylic invertebrates and fungi. Mature or veteran trees are often associated with ancient hedgerows along old boundaries such as parish or estate boundaries. Maintaining herb rich bottoms and wide margins to each side will also increase the habitat niches available and provide nesting habitat for birds and bumblebees.

The traditional method of managing hedgerows by laying on an extended cycle is an effective method of periodically rejuvenating hedgerows; it also provides a period of time for the ground flora to thrive before being shaded out by the hedge as it re-thickens.

## CONSERVATION MANAGEMENT OBJECTIVE STATUS

To maintain, enhance and restore the diversity and overall network of hedgerows on Parks Trust land.

## KEY MEASURES & INDICATORS

- Annual reporting on routine hedge maintenance operations in accordance with recommended practice for conserving the biodiversity value of the hedgerows.
- Hedgerow survey and mapping to measure the quantity of the hedgerow resource and assess its condition.

## RECENT ACTIVITIES

- Planting of new hedgerows at Simpson, Stony Stratford Nature Reserve and Stanton Low.
- Restoration of old agricultural hedgerows at Tombs Meadow, Stony Stratford.
- Laying of hedgerows at North Willen Lake, Ouzel Valley Park and Blackhorse Wood, Great Linford.

## PROPOSED ACTIVITIES

- Inclusion of disease resistant elms in new hedgerow planting wherever possible.
- Volunteer led surveys of all agricultural hedgerows on Parks Trust land (2018).
- Seek to adopt sections of retained hedgerow in new development areas and comment on planning applications for these to be treated appropriately in the site development master plans.

## Habitat Action Plan

### HAP05 – VETERAN AND NOTABLE TREES



#### STATUS

**UK BAP:** None

#### NATIONAL STATUS

In decline. The exact number of veteran and notable trees in the UK is not known. However, it is assumed that their numbers have declined over the decades. Woodland Trust records (2016) show 121,000 veteran and notable trees identified in the UK as part of the Ancient Tree Hunt.

#### LOCAL STATUS

The number of veteran and notable trees in Milton Keynes is not currently known. There are no records as yet on the Ancient Tree Hunt database for Milton Keynes.

Notable trees have been recorded, for example at Tattenhoe (Oak and Ash pollards), Howe Park Wood (Crab Apple), Kingsmead Spinney (Oak pollards), Oakhill Wood (Oak pollard), Linford Manor, Oakgrove (Ash coppice) and Pineham (Oak). Willow pollards are frequent along the Great Ouse and Ouzel rivers. An inventory of some of the ancient and notable trees in Milton Keynes, compiled by Melvyn Jones, can be found on the website of Milton Keynes Natural History Society: [www.mknhs.org.uk](http://www.mknhs.org.uk)

## ECOLOGY & ISSUES

Veteran and notable trees are those that are considered to be historic, ecologically significant and culturally important landscape features. Veteran trees are usually identified by their significant size and girth, compared to other trees of the same species. Other features which may be present include major trunk cavities or progressive hollowing, decay holes, a large quantity of deadwood in the canopy, sap runs, epiphytic plants, fungal fruiting bodies, a higher number of interdependent wildlife species and most importantly an aged appearance.

Often, veteran trees are all that remains of cleared woodlands, old orchards or historic wood pasture. They are often found in prominent positions in the landscape and it is likely that these trees are ancient land ownership or parish boundary markers.

Commonly veteran trees will have been worked in the past most often as pollards or coppice. Often their longevity is as a direct result of this cyclical pattern of cutting and the rejuvenation it stimulates. Dead trees are as ecologically important as live ones and should be retained unless there are significant safety concerns. The hulk provides a number of opportunities and niches for a number of species from bats and birds to saproxylic invertebrates, lichens and fungi.

Veteran trees and standing deadwood are essential for many species of saproxylic coleoptera (beetles and weevils reliant on rotting wood). Many of these have limited natural ranges and their presence in an area is an indicator of the longevity of the habitat and the ancient tree and deadwood resource. In 1996 The Parks Trust undertook a survey of the saproxylic coleoptera in its three ancient woodland and this is planned to be repeated in 2017.

The Parks Trust's management of veteran trees has aimed at allowing them to live their own lifespan and to decline naturally with minimal intervention. However, works are carried out when necessary to prolong the lifespan of significant and important trees mainly in the form of crown reduction. This usually involves cutting back hard into live wood and letting the crown renew itself. This has been particularly successful in the case of mature ash trees in decline and has been observed to have increased life spans by 30 years or more. Deadwood has been retained within the crown structures and where it has been necessary to remove it (because of public safety concerns) the arising deadwood has been left on site.

Compaction (by vehicles, people and grazing stock) around the root area can have a significant detrimental effect on veteran trees. In numerous cases The Trust has minimised the possibility of compaction around veteran trees by mulching with woodchip or with fencing.

## CONSERVATION MANAGEMENT OBJECTIVES

- To maintain and conserve the existing veteran and notable trees resource on Parks Trust land.
- To ensure, through selection and protection, that there is a sufficient number of younger trees (in a range of age classes) to supply future generations of veterans.

## SUMMARY OF KEY MEASURES & INDICATORS

- Annual reporting of actions undertaken on existing and potential future veteran trees.
- Mapping/recording of veteran tree resource; condition assessments.
- Results of saproxylic beetles survey (2017).

## RECENT ACTIVITIES

- Regular inspections of trees to assess health, condition etc.

- “Halo” thinning around notable trees in Shenley and Howe Park Wood in order to provide crown (growing) space for these trees as possible future veterans.

## PROPOSED ACTIVITIES

- Continue to carry out regular inspections of mature and veteran trees for the purposes of public safety and to identify any works necessary to prolong the lifespan of the trees.
- Mapping of veteran and notable trees on Parks Trust land on GIS (2017-18)
- Monitor potential damage (e.g. compaction and surface root erosion) caused by grazing stock and undertake preventative measures.
- Erect protective fencing around vulnerable veteran oaks at Kingsmead Spinney as adjacent development progresses.

# Habitat Action Plan

## HAP06 – PONDS



### STATUS

**UK BAP:** Priority Habitat

### NATIONAL STATUS

Common and widespread throughout the UK.

The Countryside Survey key findings described in the Ponds Report 2010 include:

In 2007 the number of ponds in Great Britain was estimated at 478,000.

The 2007 report provided that as measured by their composition of plants, ponds in England and Wales were largely degraded, with around 80 per cent of ponds being of Poor to Very Poor quality.

There was a high turnover of ponds between 1998 and 2007 with an estimated 18,000 ponds lost and 76,000 ponds created. New ponds were typically of better quality and supported more species than older ponds.

## LOCAL STATUS

In Milton Keynes, ponds are intrinsically linked with the population of Great Crested Newt. As the newt enjoys full UK and European legal protection, virtually all development plans impact on newt populations to a greater or lesser extent with a resultant high level of mitigation for this species. This means that most (but not necessarily all) ponds that hold Great Crested Newt are known and mapped and that new ponds are sometimes created as part of wider mitigation schemes. The Parks Trust commissioned a survey of 81 ponds in 2003 of which 22 held Great Crested Newt. In 2013, a repeat survey of 31 of these ponds showed that 16 held newts. Overall, the number of ponds in Milton Keynes is probably stable and increasing but beyond the presence of newts and other amphibians, the condition and species composition of most of them is little studied. It is unknown how many garden ponds and ornamental ponds are found throughout the city but their overall contribution to aquatic fauna is likely to be highly significant.

## ECOLOGY & ISSUES

For the purpose of the UK BAP ponds are defined as permanent and seasonal standing water bodies of up to two hectares in extent. Those that meet one or more of the following criteria are classified as priority habitat at UK BAP level:

- Habitats of international importance. Ponds that meet criteria under Annex I of the Habitats Directive.
- Species of high conservation importance: Support Red Data Book Species; UK BAP species; species fully protected under the Wildlife and Countryside Act; Habitats Directive Annex II species; a Nationally Scarce wetland plant species; or three Nationally Scarce aquatic invertebrate species.
- Exceptional assemblages of key biotic groups: Ponds supporting exceptional populations or numbers of key species.
- Ponds of high ecological quality: Ponds classified in the top PSYM category for ecological quality (i.e. a PSYM score of >75 per cent). PSYM (Predictive System for Multimetrics) is a method for assessing the biological quality of still waters in England and Wales.

Ponds provide a diverse range of habitats for plants and animals. They are heavily influenced by their underlying geology, hydrology and surrounding habitat and land use. To be valuable to wildlife they do not need to hold water all of the time; seasonal ponds that dry up every year can often be very specific niches for very rare species.

The many threats to ponds include natural succession, inappropriate management including badly timed cuts of vegetation or silt removal, pollution, illicit introductions of fish, non-native invasive plants such as *Crassula helmsii*, and fragmentation from other ponds and sympathetic landscaping by roads and other development. Some ponds, particularly those in woodland settings, are prone to disturbance from dogs when they are allowed off the lead by their owners. Over time, this causes increased turbidity of the water, a rise in nutrient levels and much denuded plant life around the margins.

In Milton Keynes, Sustainable Urban Drainage Systems (SUDS) have provided an opportunity to create new pond and wetland habitat that is linked to existing sites and wildlife corridors. For example, in the developments on the western side of Milton Keynes between 2005 and 2010, over twenty new ponds have been created and were adopted by The Parks Trust in 2012. As well as providing habitat for aquatic plants and animals, these systems add greatly to the biota of our parks as the grasslands and scrub around them support many other species.

The ponds on Parks Trust land are generally subject to regular maintenance and management works. Over the past few years an average of two ponds are dredged each year and the marginal and surrounding vegetation is managed in line with good ecological practice (e.g. rotational/cyclical cutting; mowing regimes adjusted to account for amphibians etc.) Since we have entered 51 ponds

into the Environmental Stewardship Scheme, we have restored ponds at a greater rate, concentrating on removing silt and invasive plants from ponds which were known to have declined in value to biodiversity.

Recently The Parks Trust has acquired the wetland nature reserve at Linford Lakes. As well as three larger lakes, this site holds around thirty ponds, significantly increasing the total number of ponds in our landholding. Research carried out on around one third of these ponds in the 1980s-1990s probably represents the most thorough ecological monitoring undertaken on this habitat in Milton Keynes. However, the vast majority of these ponds are now over-shaded and/or silted up and it is important that as many of these ponds as possible are brought into a favourable condition over time.

## CONSERVATION MANAGEMENT OBJECTIVES STATUS

- To conserve and enhance the quality, quantity and diversity of ponds and associated standing water habitats on Parks Trust land.
- To create new ponds in line with the following best practice guidelines to optimise ecological diversity:
  - New ponds should be created utilising natural or clean water supplies.
  - New ponds should not be artificially lined.
  - New ponds should be allowed to be colonised naturally.

## SUMMARY OF KEY MEASURES & INDICATORS

- Annual reporting on actions undertaken in managing/maintaining ponds.
- The number of new ponds created in accordance with best practice guidelines.
- The results of ecological surveys of ponds and/or connected terrestrial habitats.

## RECENT ACTIVITIES

- Restoration of ponds at Bancroft, Lodge Lake, Hazeley Wood, Linford Wood, Howe Park Wood, Waterhall Park and Woughton on the Green.
- Removal of goldfish, carp and other fish from three ponds at Howe Park Wood.
- Surveys of ponds to determine presence/absence of Great Crested Newt and other amphibians.
- Annual control measures applied to bulrush in worst affected ponds.
- Acquisition of ponds contained within new park transfers, including SUDS ponds and ponds retained or created as part of development ecological mitigation schemes.
- Acquisition of the complex of ponds contained within the Linford Lakes Nature Reserve.

## PROPOSED ACTIVITIES

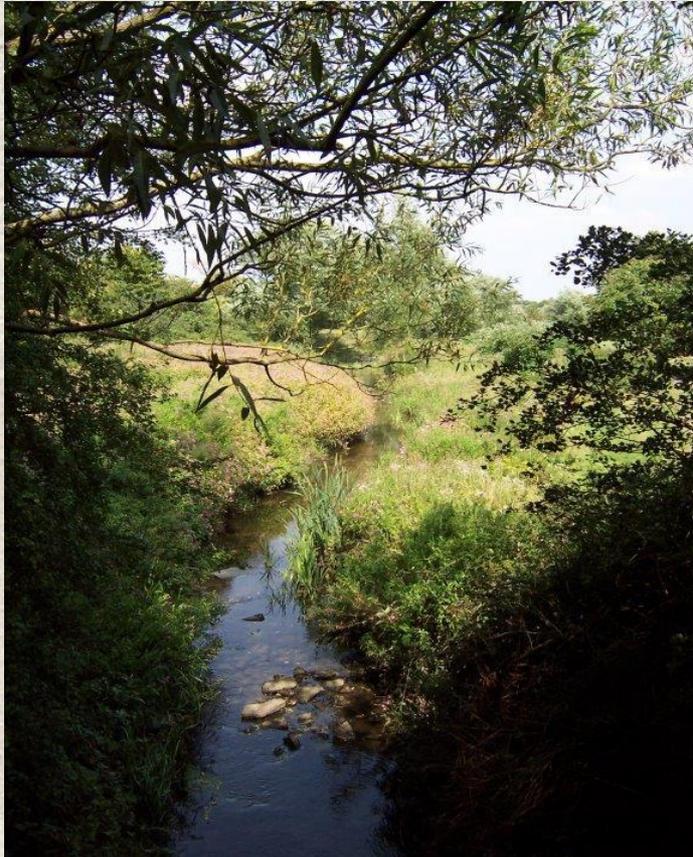
- Creation of new ponds of high ecological and biodiversity value.
- Preparation of a prioritised and targeted programme of conservation works to conserve and enhance the pond resource on Parks Trust land.
- Trial treatment of *Crassula helmsii* at two ponds at Pineham Nature Reserve (former Motorcross track) using PVC sheeting.
- Improving the habitat linkages between existing ponds of high biodiversity value.
- Dragonfly Surveys of Elfield Nature Park and Linford Lakes Nature Reserve (2017)
- Adopt new SUDS and ecological mitigation ponds from developers as proposed.
- Produce an inventory of all ponds on Parks Trust land (2019).

## LEGAL PROTECTION

Some ponds may be protected due to the presence of protected species. Ecological advice should be sought if this is the case.

# Habitat Action Plan

## HAP07 – DITCHES AND SMALL WATERCOURSES



### STATUS

**UK BAP:** None

### NATIONAL STATUS

The status of ditches and small watercourses in the UK is not known and not researched.

### LOCAL STATUS

The status and quantity of ditches and small watercourses in Milton Keynes is not known and not researched.

### ECOLOGY & ISSUES

Seasonal and permanent small watercourses and ditches can provide a valuable wildlife resource in their own right, or in association with other habitats such as hedgerows, rivers and ponds. In some habitats, such as grassland and woodland, they may be essential in maintaining the high-water levels required to support specific communities including MG4 grassland (Mesotrophic Grassland Type 4 under the National Vegetation Classification).

Ditches often have a greater botanical diversity than other nearby habitats. The species present may include Meadowsweet, Yellow Iris, Marsh Marigold, Ragged Robin, Brooklime, Water Figwort, Purple Loosestrife, Wild Angelica together with dominant species such as Reed Sweet-Grass, Reedmace or Bulrush and Reed. Aquatics such as water weeds *Potamogeton* spp. may also be present. They tend to be less disturbed or managed than larger watercourses and can therefore often support locally rare or scarce species. They provide a useful landscape ecotone and act as corridors for amphibians and reptiles. Open tussocky ditches are particularly good for Snipe and other over-wintering wading birds whilst those which are floristically rich provide nectar and pollen for butterflies and bees. Seasonal ditches can also be important for a whole range of aquatic invertebrates, such as dragonflies, caddisflies and beetles, since there are usually few if any predatory fish present. Ditches in woodland and along hedgerows can also offer important habitat for water shrews and water voles.

Many of these features are prone to loss through neglect or over-management. The timing and scale of any ditch-line clearance and cyclical management may be critical in maintaining species diversity and preventing the destruction of breeding habitat. The retention of small areas of scrub is desirable, although the complete shading of the watercourse or the development of tall scrub and trees should be avoided. In some cases the control of water levels may be required to maintain damp pastures to allow for foraging birds to reach invertebrates in soft ground.

As much of The Parks Trust's land was formerly agricultural land it contains many remnant ditches and wet/dry watercourses. Many of these have lost their original function or have dried up as a result of the surrounding land-use change and the installation of urban drainage schemes.

## RECENT ACTIVITIES

- Digging out sections of Back Brook at Floodplain Forest Nature Reserve to improve flow in times of flood.
- Relaxing of ditch clearance regime in ancient woodlands, leaving vegetation in some ditches and part-blocking ditches to allow localised flooding.

## PROPOSED ACTIVITIES

- Re-profile and widen foot-drains in Stony Stratford Nature Reserve in order to hold more water in spring and summer (habitat for young wading birds and invertebrates)
- Establish two or more sites for regular sampling of freshwater invertebrates using methods established by Environment Agency – Loughton Brook and Broughton Brook (2018).

# Habitat Action Plan

## HAP08 – RIVERS AND STREAMS



### STATUS

**UK BAP:** Priority Habitat

### NATIONAL STATUS

Water courses are generally improving in both water quality and ecological quality as River Basin Management Plans and other schemes are implemented.

### LOCAL STATUS

The Rivers Great Ouse and Ouzel continue to give some concern. The Environment Agency regularly record high levels of phosphates and nitrates and both rivers generally score poor to average in terms of water quality. Both rivers have heavily modified sections, particularly the Ouzel through Milton Keynes.

### ECOLOGY & ISSUES

This habitat encompasses all natural or near natural running waters excluding canals and ditches.

Ecological characteristics of watercourses are complex, combining many factors such as geography, substrates, flow rates, bank profiles, climate and catchment size for example. Rivers and streams are among the richest wildlife habitats in the UK and are of crucial importance for many specialised plants and invertebrates, such as Mayflies and Caddis-flies. They are associated with many bird species including Kingfisher, Common Sandpiper, Grey Wagtail, Sand Martin and Dipper and are the single most important habitat for Otter and Water Vole.

The upper Ouse is noted as an important fishery for Barbel and Large Perch, together with good numbers of Chub and Pike. The Environment Agency has identified priorities for species action: Eel and Barbel feature on this list.

The Parks Trust is the riparian landowner along substantial stretches of the Rivers Ouse and Ouzel, Loughton Brook, Broughton Brook and Caldecotte Brook in Milton Keynes. As such, The Trust has some control over the bankside land uses and vegetation management. However, the Great Ouse and Ouzel are classed as 'main rivers' and come under the regulatory and management powers of the Environment Agency and the brooks are classed as 'ordinary watercourses' and come under the regulatory and management powers of the Buckingham and River Ouzel Internal Drainage Board (IDB).

The Trust enjoys a very close working relationship with the Environment Agency and in recent years the two organisations have cooperated on several river restoration and habitat improvement schemes on the Great Ouse and Ouzel. These have included the repair of heavily eroded river banks, the creation of fish refuges and spawning sites (particularly targeted for Barbel) and the restoration of a 'lost' back channel at Passenham. The latter project offers great potential for biodiversity, offering a significant new habitat for fish, invertebrates and mammals including Water Voles. We are also one of the founding members of the Upper and Bedford Ouse Catchment Partnership, which is a partnership of local voluntary organisations which exists to facilitate and encourage action to improve the condition of rivers and watercourses.

Since 2009 we have had a Memorandum of Understanding with the IDB which sets out a joint working agreement for managing drainage works to the IDB's watercourses through our parks.

Several invasive non-native species are established on our water courses. The banks of the River Ouzel tend to be covered in Himalayan or Indian balsam in summer, which out-competes virtually all native riparian plants and eventually leads to de-stabilising of the banks. Mink and Signal Crayfish are long established in our waterways and are a significant problem within the catchment. Although Mink appear to have declined since the recovery of the Otter population, they do persist in several localities. Control of Mink numbers should be a priority in these areas.

## CONSERVATION MANAGEMENT OBJECTIVES

- Maintain or create more 'natural' bank profiles to rivers and watercourses.
- Maintain and enhance the habitat diversity and structure of bank-side vegetation.
- Conserve semi-natural habitats adjoining rivers and streams, in particular within the floodplain zone.
- Monitor sites for Water Vole and where evidence is found of populations adapt management regimes accordingly.
- Continue to work with Environment Agency to enhance fish spawning habitats.

## SUMMARY OF KEY MEASURES & INDICATORS

- Reporting on actions taken to enhance the river or stream-side habitats for biodiversity.
- Otter surveys (every five years) to indicate that the species continues to occupy known stretches of river course and is extending its range.
- Environment Agency published assessments of river condition.

## RECENT ACTIVITIES

- Re-creation of back channel (weir bypass) at Passenham opposite Stony Stratford.
- Soft engineering works on River Ouzel in partnership with Environment Agency, to create riffles, fish spawning sites and bank defences.
- Ongoing management of willow pollards along the river valleys.
- Installation of Otter holts at Passenham, Stony Stratford, Pineham and Caldecotte Lake (2015).
- Management of Himalayan balsam along Loughton Brook in Loughton village and other locations.
- Development of the Floodplain Forest Nature Reserve, Ouse Valley Park.
- Founding membership of the Upper and Bedford Ouse Catchment Partnership.

## PROPOSED ACTIVITIES

- Continuation of bankside and in-channel soft engineering and habitat diversification projects in partnership or guided by with the Environment Agency.
- Identify and reinstate further back and side channels to provide refuges for fish, subject to EA consent where necessary.

## Habitat Action Plan

### HAP09 – REEDBEDS



#### STATUS

**UK BAP:** Priority Habitat

#### NATIONAL STATUS

Stable. There are over 5000 hectares of reedbed in the UK but only 50 or so sites are greater than 20 hectares in extent.

#### LOCAL STATUS

Reedbeds (NVC S4 *Phragmites australis*) are localised in Milton Keynes and predominantly associated with the margins of larger lakes. The largest single reedbed system is at Walton Lake. The recent acquisition of Linford Lakes Nature Reserve has significantly increased The Trust's total reedbed resource with reed beds present along most of the margins of the various water bodies. Lodge Lake also has extensive reed dominated areas and Caldecotte and Willen Lakes have smaller reed beds. The ongoing development of the Floodplain Forest at Manor Farm will include the planting of many thousands of reeds as part of the habitat creation scheme.

## ECOLOGY & ISSUES

Reedbeds are a wetland habitat that is dominated by a single species, common or Norfolk reed (*Phragmites australis* a.k.a. *P.communis*). Reedbeds have a permanent above ground water table and can occur in freshwater, brackish and marine environments.

In natural conditions, reed beds are a transitional stage of wetlands, developing into woodland or carr. Management schemes are usually aimed at preventing this succession. They are an important habitat for mammals such as Otter, Water Vole and Harvest Mouse. A number of bird species are reed bed specialists including Bittern (RSPB Red List), Marsh Harrier (RSPB Amber List), Bearded Tit (RSPB Amber List) and Water Rail (RSPB Amber List). The last of these is regularly recorded in Milton Keynes' reed beds and may breed, while the others currently occur as winter visitors and passage migrants. Several warbler species including Reed Warbler, Sedge Warbler and Cetti's Warbler are regular nesting species and these nests may be parasitized by Cuckoos. Reed beds host many hundreds of specialist invertebrates including Beetles, Caddis-flies, Spiders and Micro-Moths. All stages in reed growth, from young shoots to mature and dead stems, support a range of invertebrates. The greater the diversity of age and structure within a reed bed, the more species of invertebrate will be present.

Reed beds are used as nurseries by some fish species. Rudd are able to traverse ditch systems accessing reedbeds to forage. Open water within reed beds will support frogs and toads and Grass snakes may thrive in them, using piles of cut and decaying reed as communal egg laying sites.

Reed beds are known to be particularly effective filters of pollutants such as diesel and petrol where they contaminate a waterbody. As a result, small reed beds are often planted in connection with urban developments and indeed are often included as a feature of Sustainable Urban Drainage Systems (SUDS). Whilst small, such reed beds will considerably enhance the biodiversity and biomass of these ponds.

The main losses of reedbeds are due to water abstraction, land drainage or succession to woodland and scrub. Reedbeds also suffer from inappropriate management. If reeds are cut too often this may lead to drying out, scrub encroachment and further succession. The accumulation of dead plant matter within the reed bed results in a similar problem with the bed eventually beginning to dry out and leading to succession.

Reed beds are a particularly scarce habitat in North Bucks and in that context those on Parks Trust land are of great importance and value. Priority needs to be given to maintaining the hydrology of these beds and the prevention of succession.

## CONSERVATION MANAGEMENT OBJECTIVES

- To maintain the existing zones of reedbed habitat on Parks Trust land in a favourable condition for biodiversity.
- To increase the extent of reedbed on Parks Trust land.
- To undertake ecological monitoring of key reedbeds e.g. Walton Lake, Lodge Lake.

## RECENT ACTIVITIES

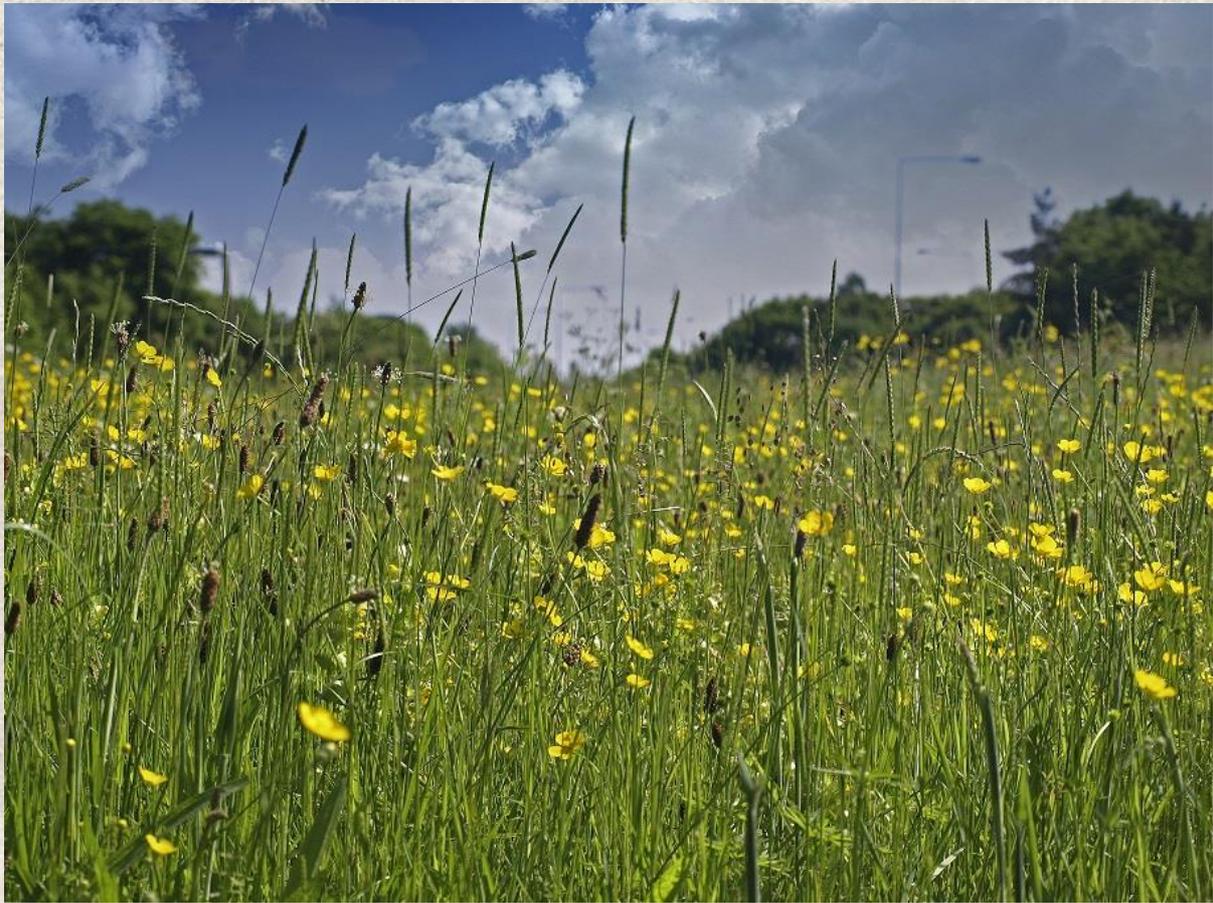
- Invasive scrub clearance in reed beds at Walton Lake and Willen Lake.
- Creation of open channels in reed bed at Walton Lake to increase the reed edge habitat (important for several bird species and fish).
- Invertebrate surveys of reed beds at Lodge Lake and Walton Lake undertaken in 2017.

## PROPOSED ACTIVITIES

- Further removal of scrub and large trees from Walton Lake reed bed.
- Creation of new reed beds as part of the creation of the Floodplain Forest Nature Reserve, Ouse Valley Park.
- The planting of reeds at Ashland lakes to reduce pollution and to create refuges for fish and amphibians.
- Maintain areas of open water and edge habitat in larger reed beds.

## Habitat Action Plan

### HAP10 – MEADOWS



## STATUS

**UK BAP:** Priority Habitat – Lowland Meadows and Lowland Dry Acid Grasslands

## NATIONAL STATUS

In decline. National Vegetation Classification (NVC) MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland, the mainstream community of unimproved hay meadows and pastures over much of Britain, is now highly localised, fragmented and restricted to small fields. Recent estimates for cover in England and Wales indicate that there is between 5,000-10,000 hectares of this grassland community remaining having declined by about 94 per cent.

Unimproved, seasonally flooded NVC. MG4 *Alopecurus pratensis* – *Sanguisorba officinalis* grasslands are not as widely distributed with less than an estimated 1,500 hectares found in scattered localities from the Thames valley through the Midlands and from the Welsh borders to the Ouse catchment in Yorkshire.

## LOCAL STATUS

The flora and plant communities of Milton Keynes are characteristic of the underlying clay soils. Semi-natural grasslands including meadows (MG4 grassland and MG5 grassland) were recorded (Francis, J 1997) at Waterhall Park South, Caldecotte, Browns Wood, Bancroft Park and Tattenhoe Park.

Further surveys in 2012 and 2015 (Taterenko, I) have found that other hay meadows in Ouse Valley Park (Old Wolverton) and elsewhere could be restored to MG4 with the right management.

Neutral grassland communities (NVC.U1 *Festuca ovina* – *Agrostis capillaris* – *Rumex acetosella* grassland) were recorded at Simpson Warren, Shenley Toot and Hills and Hollows, Bradwell.

Approximately 140 hectares of grassland in linear parks are currently managed by annual hay cutting or are managed as long grass with some areas cut once every three years. A further 350 hectares is managed as grazing land; lowland meadow is therefore a major habitat component of The Parks Trust's green estate.

## ECOLOGY & ISSUES

The UK BAP meadows habitat includes most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK; unimproved seasonally-flooded grasslands are also included in this habitat type.

Lowland meadows are believed to have declined by a staggering 97 per cent since World War II and with them a huge number of plants, invertebrates, mammals and birds. A variety of meadow specialists including Green Winged Orchid, Bumblebees and birds such as Skylark and Meadow Pipit have undergone alarming declines. Nevertheless, species rich meadows are still one of the most diverse and valuable habitats found in the UK.

Traditionally, lowland meadows were managed for a hay crop harvested in July with aftermath grazing from August into winter. The main pressure on lowland meadows is from changes in agricultural practices. Some are being used for silage and as grazing pastures in the spring whilst others have been converted into arable. Other pressures include scrub encroachment and dereliction in marginal areas and the application of fertilisers and pesticides to encourage healthy grass growth at the expense of the overall plant communities. MG4 grasslands are particularly sensitive to changes in water levels through increased or decreased periods of inundation or changes in ground water levels. Ditch management systems that maintain infield water levels and the overall hydrology need to be maintained, monitored and restored where appropriate to conserve these meadows.

Areas of relatively low floristic value can be restored to good condition with the appropriate management. Taking green hay from a species-rich grassland and strewing it over the receptor site, at a standard rate of 1:3 hectares, is a process which has proved successful in some of our grasslands, although it may take three or more years for results to show. This method of habitat restoration is preferable to introduction of imported seed, which often contains alien species or species unsuitable to local conditions.

Finally, dry acid grassland is very rare in Milton Keynes with just a few small areas restricted to previously occupied sites of historical importance. It is likely that soil conditions combined with sheep grazing are important factors in the continued presence of these grasslands in Milton Keynes.

## CONSERVATION MANAGEMENT OBJECTIVES

- To conserve and enhance the condition of semi-natural meadow grasslands on Parks Trust land.
- To restore currently impoverished floodplain meadow grasslands to MG4 grasslands.

## RECENT ACTIVITIES

- Establishment of a partnership project with The Floodplain Meadows Partnership, based at The Open University.
- Surveys of floodplain grasslands (2012 and 2015) showing current condition of these meadows and identifying good candidates for restoration to MG4.

- Green hay strewing (from MG4 meadow at Tattenhoe) into species-poor hay areas to improve species diversity.
- Entering 39 hectares of our grasslands under Higher Level Environmental Stewardship options HK6 and HK7 (Conservation and Restoration of species rich, semi-natural grassland).
- Re-assessing the timing of hay cuts when specifying maintenance contracts in order to ensure that some areas of long grass are left late into the season.

## PROPOSED ACTIVITIES

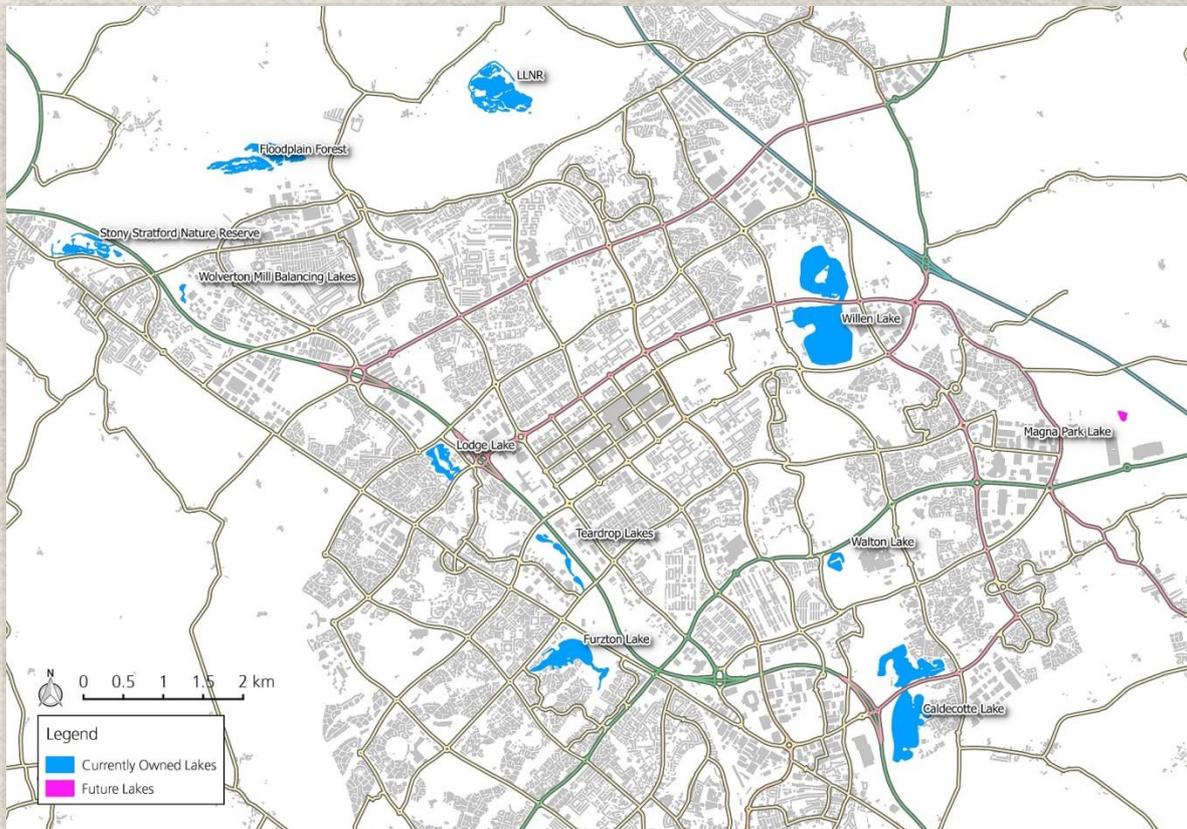
- Creation of species-rich meadow at Floodplain Forest Nature Reserve using locally sourced green hay.
- Continue practice of green hay strewing into grassland areas showing reduced floristic diversity.
- Renew management of meadows at Linford Lakes Nature Reserve, including aftermath grazing.
- Acting on advice from Floodplain Meadows Partnership, introduce double hay cuts at selected sites to reduce nutrient levels (subject to discussions with Natural England if land is included in HLS agreement).
- Acquisition of Oxley Mead SSSI (MG4 meadow) and implementation the appropriate management regime.
- Acquisition of Stanton Low Park and managing 29 hectares of the grasslands to enhance their biodiversity value (meadows and rough grassland habitats).
- Acquisition of the Magna Park extension to Broughton Brook Linear Park and enhancement of the three hectares of meadow habitat with that site.

## LEGAL PROTECTION

None

# Habitat Action Plan

## HAP11 – EUTROPHIC STANDING WATER



### STATUS

**UK BAP:** Priority Habitat

### NATIONAL STATUS

Stable. There are no accurate estimates of the amount of eutrophic standing water in Great Britain. The total area of still inland water is estimated as 675 km<sup>2</sup> in England, 125 km<sup>2</sup> in Wales and 1604 km<sup>2</sup> in Scotland. Current work suggests that over 80 per cent of this resource in England, some 40 per cent in Wales and approximately 15 per cent in Scotland is eutrophic. On this assumption, the area of eutrophic standing water in Great Britain would be about 845 km<sup>2</sup>.

### LOCAL STATUS

The County Biodiversity Opportunity Area Statement for Milton Keynes City identifies the city's lakes as valuable for biodiversity in a county context.

The Eutrophic Standing water bodies (over two hectares in size) within the Parks Trust's portfolio of parks are listed below. These are all man-made lakes; most are part of the city's strategic surface water management system and serve as balancing reservoirs operated for this purpose by the freeholder Anglian Water. The exceptions to this are the lakes in the Stony Stratford and Linford

Lakes Nature Reserves, which are flooded former gravel pits within the floodplain of the River Great Ouse, and Walton Lake, which was excavated to receive surface water primarily from the surrounding highways and therefore serves as a localised balancing reservoir but is not actively managed for this purpose by Anglian Water.

Ashlands Lakes (chain of lakes within balancing reservoir)

Caldecotte Lake (north and south) (balancing reservoir)

Furzton Lake (balancing reservoir)

Linford Lakes Nature Reserve (flooded former gravel pits)

Lodge Lake (balancing reservoir)

Stony Stratford Nature Reserve Lakes (flooded former gravel pits)

Teardrop Lakes (combined) (balancing reservoir)

Walton Lake

Willen Lake (north and south) (balancing reservoir)

Wolverton Mill Balancing Lake (balancing reservoir)

## ECOLOGY & ISSUES

In the context of this habitat action plan, Eutrophic Standing Waters are defined as natural and man-made still waters such as lakes, reservoirs and gravel pits over two hectares in size (those below that size are covered under the ponds habitat action plan). They are classified as eutrophic because plant nutrients are plentiful, either naturally or as a result of artificial enrichment. They characteristically have dense, long-term populations of algae in mid-summer, often making the water green. Their beds are covered by dark anaerobic mud, rich in organic matter.

In their natural state eutrophic waters have high biodiversity. Planktonic algae and zooplankton are abundant in the water column, submerged vegetation is diverse and numerous species of invertebrate and fish are present. Plant assemblages differ according to geographical area and nutrient concentration but Fennel-leaved Pondweed *Potamogeton pectinatus* and Spiked Water-milfoil *Myriophyllum spicatum* are characteristic throughout the UK. Common floating-leaved plants include Yellow Water Lily *Nuphar lutea* and there is often a marginal fringe of Reed-swamp, which is an important component of the aquatic ecosystems. Bottom-dwelling invertebrates such as Snails, Dragonfly Nymphs and Water Beetles are abundant. There have been no recent invertebrate surveys of the Parks Trust's lakes; the most recent was carried out in 1995.

Coarse fish such as Roach *Rutilus rutilus*, tench *Tinca tinca* and Pike *Esox lucius* are typical of eutrophic standing waters, but Salmonids also occur naturally in some. Amphibians may be present and the abundance of food can support internationally important bird populations. Reedbeds are used by spawning fish and amphibians and provide foraging habitat for bitterns *Botaurus stellaris* and grass snakes *Natrix natrix*. Notable mammals recorded using reeds and water bodies include Harvest Mouse *Micromys minutus*, Water Vole *Arvicola amphibius*, Otter *Lutra lutra* (which have been increasingly recorded using water bodies in Milton Keynes and expanding their range (Bernwood ECS 2010) and several bat species, mainly Daubenton's Bat *Myotis daubentonii* and Noctule Bat *Nyctalus noctula*. Bird species recorded using the wetlands around ponds and lakes include Lapwing *Vanellus vanellus*, Bittern, Snipe *Gallinago gallinago* and Green Sandpiper *Tringa ochropus*.

In water bodies that are heavily enriched, their value and potential for biodiversity is depressed. Over-enrichment within lakes can occur as a result of the quality of water flowing into them either from rivers and streams or as run-off from surrounding land. These problems can be exacerbated by the

removal of vegetation and reed swamp at inlets, which are effective barriers to particulate matter and act as sinks for nutrients.

The introduction of fish, the removal of predators, and the manipulation of existing fish stocks for recreational fishing leads to the loss of natural fish populations and may affect plant and invertebrate communities. Heavy stocking of bottom-feeding fish such as Carp *Cyprinus carpio* can cause turbidity and accelerate the release of nutrients from sediments.

Use of standing waters for recreational and sporting purposes can create disturbance, which affects bird populations. Marginal vegetation may suffer from trampling and the action of boat hulls and propellers destroys aquatic plants and stirs up sediment, contributing to enrichment and encouraging the growth of algae. The construction of marinas and other leisure facilities may destroy valuable habitat and can lead to increased pollution.

Invasive non-native plants and animals can be very damaging. The Signal Crayfish *Pacifastacus leniusculus*, has had the dual impact of destabilising the ecology of some waters by consuming large amounts of aquatic vegetation, consuming fish eggs and eliminating many populations of native crayfish by spreading crayfish plague. Invasive plants such as New Zealand Pygmyweed *Crassula helmsii* and Water Fern *Azolla filiculoides* can completely take over ponds and lakes, out-competing all native flora.

Many of the earlier ecological studies carried out in Milton Keynes looked at issues such as pollution and sedimentation, together with vegetation, invertebrate and fish populations. The most recent study (1997) at South Willen Lake indicated that the lakes receive sediments and pollution from both the river and drainage from Milton Keynes. The study found high levels of metals including cadmium, copper and nickel, the latter at sufficiently high levels to be considered toxic and will have implications for long term future management.

Excessive nutrient levels in Willen and Caldecotte Lakes are believed to contribute to the occurrence of blooms of toxic blue-green algae (cyanobacteria), which the Trust has sought to control by use of a propriety ultrasound irradiation system. A system of ultrasound transducers powered by solar energy were installed on South Willen Lake in 2006. The ultrasound pulses emitted from these units cause cellular collapse in blue-green algae. Since the installation of this system, algal blooms on the lake have reduced considerably. The Parks Trust reports any occurrence of blue-green algal blooms to The Environment Agency and liaises closely with them on water quality issues. Periods of very hot weather can lead to depleted oxygen levels in our lakes which may lead to high fish mortality. For the lakes within the Parks Trust's portfolio, there are a number of factors affecting their biodiversity that are beyond the Trust's control. Primarily these are the quality of water flowing into the lakes from rivers and other watercourses and the management of water levels in relation to the lakes' balancing function. However, the Trust has more influence and control over the following factors:

- The management of the recreational and sporting use of the lakes (including angling).
- The management of lake surrounding, marginal and aquatic vegetation.
- The management of fish stocks.

To manage the recreational and sporting use of the lakes, The Parks Trust has adopted a zoned system on the larger lakes at Willen and Caldecotte, with separate areas designated for water sports and for nature conservation. At Walton Lake, Linford Lakes Nature Reserve and Stony Stratford Nature Reserve, biodiversity conservation has been set as the priority and these areas are valuable for habitats and species that have their own action plans, including: Reedbeds (HAP09); Wetland birds (SAP11); and Otter (SAP14).

## CONSERVATION MANAGEMENT OBJECTIVES

To maintain and enhance the biodiversity of the lakes within Milton Keynes, balancing the wildlife conservation with the requirements of flood prevention management and providing for sport and recreation.

## RECENT ACTIVITIES

- Progress with related habitat and species action plans, especially Reedbeds (HAP09); Wetland birds (SAP11); Otter (SAP14) and Water Vole (SAP16).
- Management activities for invasive and introduced species.
- Increased data available on water quality and the ecological function and role of the lakes.
- Recent Activities (refer also to related habitat and species action plans)
- Management of Canada geese populations (egg treatment) to avoid dominance by this species.
- Carp introduced to South Willen Lake to control aquatic weeds.
- Annual weed cutting and removal programme – Willen and Caldecotte lakes.
- Limnological study of Caldecotte Lake (Bircak, Ondrej 2012)
- Acquisition of 2.5 ha balancing lake at Magna Park (Broughton Brook Linear Park).

## PROPOSED ACTIVITIES

- Continue the zoned management of the lakes and water bodies to protect and conserve the areas of highest value and potential for biodiversity.
- Continue to manage the parkland and vegetation surrounding the lakes and in marginal zones to protect the lakes avoid damage or erosion that could contribute to over-enrichment or pollution in the lakes.
- Fisheries management in consultation with Milton Keynes Angling Association.
- Increased working with the Environment Agency and Anglian Water to increase understanding and data available on water quality and the ecology of the lakes.

## DESIRABLE ACTIVITIES

- The establishment of silt trapping schemes to improve the ecological function of the lakes.
- Acquisition by The Parks Trust and/or developers of additional eutrophic standing water bodies over two hectares in size from Milton Keynes Council and other developers.

## LEGAL PROTECTION

All wild birds, their nests and eggs are protected by the Wildlife and Countryside Act 1981.

Great Crested Newts are fully protected under the Conservation of Natural Habitats and Species Regulations 2010 and Wildlife & Countryside Act 1981 (as amended). It is illegal to capture, injure or kill a European Protected Species or damage/destroy their breeding places and foraging places.

Applications for European Protected Species licences for the conservation of or development affecting Great Crested Newts and other Schedule 2 species are currently made to Natural England.

The control and licensing of fish movements and stocking lies with the Environment Agency.

## REFERENCES

Bernwood ECS, 2010. Review of otter distribution in Milton Keynes. Bernwood ECS, Swanbourne.

Biggs J., Williams P., Whitfield M., Nicolet P. and Weatherby, A. 2005. 15 years of pond assessment in Britain: results and lessons learned from the work of Pond Conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems* 15: 693-714.

Bircak, Ondrej, 2012. Assessment of algal bloom occurrence in Caldecotte Lake, Milton Keynes (MSc Thesis).

Websites

UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.

<http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsfinalAllhabitats20081022.pdf>

# Habitat Action Plan

## HAP12 – TRADITIONAL ORCHARDS



### STATUS

**UK BAP:** Priority Habitat.

### NATIONAL STATUS

The total extent of traditional orchards in the UK is estimated at 25,350 hectares. This puts the habitat at the rarer end of the scale in comparison with most other UK BAP priority habitats.

### ECOLOGY & ISSUES

Traditional orchards are defined as orchards managed in a low intensity way, as opposed to orchards managed intensively for fruit production, typically using insecticides and fertilisers and planting of short lived, high density dwarf trees. Traditional orchards can include not only fruit trees but also cobnut species, principally hazel and walnut.

Traditional orchards are a long-established and widely distributed habitat and make a useful contribution to biodiversity, landscape character and local distinctiveness across the UK. Orchards are hotspots for biodiversity, supporting a wide range of wildlife including a number of UK BAP priority species e.g. Noble Chafer *Gnomoris nobilis*, Mistletoe Marble Moth *Celypha woodiana* and Spotted Flycatcher *Muscicapa striata*. Orchard wildlife depends on the mosaic of habitat types provided including fruit trees, scrub, hedgerows, orchard floor, fallen deadwood, fallen fruit and associated features such as ponds and ditches. Much of the inherent biodiversity value of orchards is in the genetic diversity of the fruit cultivars themselves.

Woughton-on-the-Green Community Orchard is the largest orchard in our estate covering an area of approximately three hectares. It was planted in the early 1980s with a variety of old English apples and a few cherry trees. Adjacent to the main orchard is a cider apple orchard which has recently been planted with over 100 perry pear trees.

There is an old apple orchard on the western edge of Howe Park Wood consisting of about 25 trees. This orchard was recently adopted by The Parks Trust and has been managed since the construction of the Passive House. The position of this orchard next to this ancient woodland SSSI suggests that its potential for biodiversity is high. It is well used by invertebrates and birds and could offer breeding opportunities for species such as Spotted Flycatcher.

There are the remnants of an old apple orchard on the north-eastern edge of Linford Wood. These trees are over 100 years old and may support an abundance of biodiversity.

A fruit and nut orchard was planted at New Bradwell in Ouse Valley Park in 2007 consisting of some 150 trees. A small orchard at Bancroft in North Loughton Valley Park consists of some 21 apple trees.

The opportunities provided by traditional orchards for biodiversity are many and varied. Fruit tree blossom in spring provides an important early nectar source for insects such as Butterflies, Honey Bees and in particular Bumblebees, especially in cold springs when there may be few other wildflowers around. The branches harbour a wide variety of invertebrates and cavities in large, mature fruit trees provide nesting sites for birds such as Spotted Flycatchers and Lesser Spotted Woodpeckers together with beetles. Retention of deadwood in orchards is desirable, although there is a tendency to remove dead branches in commercial orchards. In the autumn and early winter, fallen fruit provides

a very important food source, firstly for insects such as butterflies prior to hibernation and latterly for birds. Blackbirds and thrushes such as Redwing and Fieldfare will take advantage of rotten fruit in hard winters and it is sometimes the only food readily available to them. Mammals will also take advantage of fallen fruit. Orchards are also known to be important foraging sites for hedgehogs and several bat species.

Mistletoe *Viscum album* is a hemi-parasitic plant which is typically found growing on apple and pear trees (although many other host species are known). Although large infestations of mistletoe can be damaging to fruit trees, it is itself a declining species and has a number of scarce invertebrate species associated with it. Its berries are eaten (and seeds spread) by several bird species, notably Blackcap *Sylvia atricapilla* and Mistle Thrush *Turdus viscivorus*. Mistletoe can be introduced to apple orchards by carefully rubbing the seeds into areas of smooth bark on branches of approximately 20mm diameter. Early spring is the best time of year for introducing seed. Growth is very slow in the first three to four years, so branches should be labelled and the germination and growth of seedlings closely monitored.

In addition, orchards are known to support a variety of lower plants such as lichens (including many nationally rare and nationally scarce species) and mosses as well as fungi, including wax caps *Hygrocybe* species.

## RECENT ACTIVITIES

- Restoration of apple orchard adjacent to Howe Park Wood.
- Planting of fruit and cobnut orchard at New Bradwell in 2007/8.
- Planting of pear trees at Woughton on the Green.

## PROPOSED ACTIVITIES

- Plant up two more small orchards consisting of apple and pear cultivars.
- Introduce mistletoe to orchards at Woughton on the Green and Howe Park Wood and monitor the growth of seedlings.

## Species Action Plan

### SAP01 – BLACK POPLAR (*POPULAS NIGRA* SSP. *BETULIFOLIA*)



## STATUS

**UK BAP:** Priority Species

## NATIONAL STATUS

Native. Considered to be our rarest native timber tree species (White, 1993). Latest estimates put the UK population at around 10,000 trees originating from fewer than 100 clones, some being represented by several thousand trees and others by just one individual tree.

## LOCAL STATUS

The national stronghold of the species is the Vale of Aylesbury, some 15 miles south-west of Milton Keynes with a population of about 4,000 trees. In Milton Keynes it is found sporadically throughout the Ouzel Valley Park with a few more found in the Ouse Valley. Described as 'locally common' (Maycock, Woods 2005). The total population in Milton Keynes is likely to be fewer than 100 trees.

## ECOLOGY & ISSUES

Black Poplars are rare as a result of human activity. Their original habitat was along unmanaged rivers and streams that provided areas of bare wet mud throughout the summer, essential for seed germination and growth. Human modification and management of watercourses has denied them of these areas. Black Poplars can also grow as cuttings from fallen branches or even fallen trees. The irregular growth form of Black Poplars compared to regular growth forms of hybrid poplars developed from the 18th century onwards meant that they were rarely planted, as they were less

commercially viable as timber trees.

The Black Poplar is dioecious (having separate male and female plants) with the males having crimson and the females' green catkins. Of the 10,000 or so Black Poplars remaining in the UK, just a few hundred are female therefore natural pollination in the wild is extremely rare.

Black Poplars can provide roosting sites for bats and nesting sites for birds such as Hobby and Little Owl.

The Black Poplar population has been and is reliant on human actions; this has led to a very uneven distribution of both trees and clones across the country, with often less than 100 trees in many counties. Along with the Vale of Aylesbury, the other major population centre is Manchester, where several thousand were planted as they could cope with the local air pollution. Plantings of Black Poplars have often been of the same clone, this being so for the 'Manchester' Black Poplar which has allowed the local population to become incredibly vulnerable to disease, as was the English Elm whose populations consisted of just one or two clones. This vulnerability was realised in 2000 when the Manchester clone was affected by a virulent fungal disease known as poplar scab that threatens to wipe it out.

Current research is aimed at fully describing the clonal status of the Black Poplar, so as to inform practical actions aimed at preserving the widest possible genetic stock into the future.

## CONSERVATION MANAGEMENT OBJECTIVES

To maintain and enhance the population of Black Poplar in Milton Keynes. Seek to improve genetic diversity of local population.

## RECENT ACTIVITIES

- Planting of Black Poplar saplings at Millfield, Stony Stratford (2005).
- Planting of Black Poplar cuttings at Floodplain Forest Nature Reserve (2015)

## PROPOSED ACTIVITIES

- Map, monitor and assess all native Black Poplars identified in Milton Keynes.
- Establish links with National Black Poplar Working Group and Forest Research with a view to obtaining saplings from different clones.
- Plant Black Poplars of local provenance in suitable locations e.g. Floodplain Forest Nature Reserve and elsewhere in Ouse Valley.

## DESIRABLE ACTIVITIES

- DNA sampling of local Black Poplars to establish clonal identities as part of national effort.

## LEGAL PROTECTION

None, unless covered by a Tree Protection Order.

## REFERENCES

White, J (1993). Black Poplar: The Most Endangered Native Timber Tree in Britain

Maycock, Woods (2005). A Checklist of the Plants of Buckinghamshire.

## Species Action Plan

### SAP02 – NARROW-LEAVED EVERLASTING PEA LATHYRUS SYLVESTRIS



#### STATUS

**UK BAP:** None

#### NATIONAL STATUS

Native, Least Concern. The distribution of Narrow-Leaved Everlasting Pea is stable and is described as being scattered throughout the UK but local and mainly southern. However, other authors describe it as rather rare and notably Rackham (2003) describes it as a plant that has “become nationally quite rare”.

#### LOCAL STATUS

Narrow-Leaved Everlasting Pea is not recorded in the County Rare and Scarce Plants of Buckinghamshire (BMERC 2009). However, A Checklist of the Plants of Buckinghamshire (Maycock and Woods, 2005) describes it as “Very rare; woodland edges and hedges in the north”; and Druce (1926, ‘The Flora of Buckinghamshire’) lists only sites near Burnham Beeches and a “hedge outside Linford Wood”. Currently, the species is only known from one ride towards the northern end of Shenley Wood.

#### ECOLOGY & ISSUES

A native plant with records for many parts of England, the Welsh coastline and southern Scotland. Some populations in the Midlands are believed to be introduced. The plant is a perennial of old hedge banks, woodland edge and scrub. Rackham (1980) categorises it within a group of what he describes as circumboscal plants which are those plants which grow in the general vicinity of ancient woodlands rather than within the woods themselves. It is not considered an Ancient Woodland Indicator species.

The Pea is a vigorous climber or rambler and given sufficient time it has been known to dominate areas of grassland. The Shenley Wood population consists of three distinct patches which grow principally over bramble scrub along a ditch in an area of not more than 25m. The ride is steep, well drained and quite heavily shaded (and efforts to establish the plant in other sites should aim to replicate these conditions). Its flowering season can vary markedly from one year to the next depending on the

conditions in spring. The bright pink flowers are attractive to some bumblebees and hoverflies and the foliage is attractive to certain species of beetle, weevil and caterpillar. The seed pods generally ripen in August to September and are easily collected.

Although there are historical records for the plant at Linford Wood, none of the flora surveys carried out here (1978, 1984, 1993 and 2015) have located it.

## CONSERVATION MANAGEMENT OBJECTIVE

- To conserve and enhance the known population of Narrow-Leaved Everlasting Pea.
- To introduce the Narrow-Leaved Everlasting Pea into new woodland locations.

## KEY INDICATOR

- Population and distribution observations and records for the species.

## RECENT ACTIVITIES

- Collection of seed from Shenley Wood plants and sowing into another woodland ride.
- Seedlings grown from seed collected at Shenley Wood have been planted into 'orchid trail' ride at Linford Wood (2015).
- Establishment of seed bank for Narrow-Leaved Everlasting Pea and other woodland plants at Richmond Fellowship grounds in Stony Stratford (2016).

## PROPOSED ACTIVITIES

- Maintain and monitor existing population at Shenley Wood and seek to establish the plant in different areas of the wood.
- Establish new populations in suitable locations e.g. Oakhill Wood.

## LEGAL PROTECTION

None

## REFERENCES

Cheffings, C.M. and Farrell, L. (eds) 2005. The vascular plant red data list for Great Britain. JNCC.

Preston, C.D., Pearman, D.A. and Dines, T.D. New Atlas of the British and Irish Flora. Oxford University Press.

Rackham, O. 2003. Ancient Woodland. Its History, Vegetation and Uses in England. Castlepoint Press.

Maycock, R. and Woods, A. 2005. A Checklist of the Plants of Buckinghamshire.

## WEBSITES

The Botanical Society of the British Isles: [www.bsbi.org.uk](http://www.bsbi.org.uk)

## Species Action Plan

### SAP03 – BUMBLEBEES *BOMBUS SPECIES*



## STATUS

**UK BAP:** Four UK BAP Priority Species

## NATIONAL STATUS

Long term decline. All but a few species have declined in abundance since 1940s.

25 species have been recorded as resident in the UK of which three are now thought to be extinct and most others are in long-term decline. One new species, *Bombus hypnorum*, has colonised England from mainland Europe in the past decade. One of the extinct species, *B. subterraneus* is currently the subject of a reintroduction programme in Southern England.

## LOCAL STATUS

The diversity and distribution of bumblebee species is not fully understood within Milton Keynes. However, a recent bee survey of two of our green spaces identified nine *Bombus* species, two of which were previously unrecorded in Milton Keynes.

## ECOLOGY & ISSUES

Bumblebee colonies are established in early spring by a queen who has over-wintered in an underground burrow or log pile. At first, the queen will spend much of her time feeding at early flowers to establish a significant nectar store before producing workers, which may number between 50 and 300 depending upon the species. Once the colony is established, worker bees may forage up to half a mile away from the nest. Workers only live for a few months whilst a queen may survive between one and two years with only one generation of new queens produced each year. Later in the season, male bees (drones) will be produced, whose only function in the colony is to mate with the queen. In recent years, queens and workers of *B. terrestris* have remained active through mild winters suggesting that climate change may lead to extra generations provided there is a sufficient nectar source through the winter months.

The most significant threats facing bumblebees are isolation of populations through urban development and loss of food-plants such as clovers across the wider landscape, largely as a result of agricultural intensification. Decline is thought to be a cumulative result of several factors:

- Loss of wildflower rich grasslands used for foraging.
- The decline in traditional methods of woodland management resulting in glades and woodland rides becoming over-shaded and of limited value to bees.
- The increase in urban areas associated with ornamental planting in smaller and smaller gardens and increased use of paving in urban habitats.

The lack of suitable foraging areas can result in ever smaller colonies which are more vulnerable to disease and predators.

Bumblebees are recognised as one of the most prolific pollinators of commercial crops. The decline in bumblebees and other insect pollinators has had an economic impact with decreased in crop production. In 2014 the UK Government published its National Pollinator Strategy identifying a series of measures to help pollinating insects recover over the next 10 years and beyond. Pollinating insects are worth an estimated €8million to the EU in terms of food production.

The B-lines scheme is a new initiative developed by the charity Buglife which seeks to offset the widescale loss of wildflower meadows by creating a network of connected 'bee friendly' habitats, focusing on several cities and densely populated areas of Britain. Corridors of habitat linking sites rich in wildflowers and insect pollinators will benefit a wide range of plants and animals but especially bumblebees.

## MANAGEMENT OBJECTIVES

To maintain and improve the available habitat resource for bumblebees on our land.

## KEY INDICATOR

Population and distribution records for bumblebee species across our land.

## RECENT ACTIVITIES

- Sampling of bee species including bumblebees at Elfield Nature Park and Stonepit Field 2013.
- Altered grassland management specifications in grounds maintenance contracts.
- Wildflower enhancement of woodlands and grasslands.

- Sowing of nectar rich plants in three vacant pony paddocks at Lodge Lake, Walton Lake and Woughton on the Green.

## PROPOSED ACTIVITIES

- Seek to develop B-lines across our land to tie in to the national Buglife network
- Arrange training for Parks Trust staff and volunteers in bumblebee identification and recording at specific parks (using Transect method)
- Continue with sowing bumblebee strips at vacant pony paddocks.

# Species Action Plan

## SAP04 – BLACK HAIRSTREAK *SATRIUM PRUNI*

### STATUS

**UK BAP:** Priority Species

### NATIONAL STATUS

Very rare but stable. Found only in woodlands and hedgerows along a line of heavy clay between Oxford and Peterborough. Now known from approximately 80 sites nationally. There are some localised populations within the Vale of Aylesbury and several strong populations in the old Bernwood Forest area.

### LOCAL STATUS

Rare and probably declining. There are historic records for Linford Wood (1874) and Oakhill Wood (1938). However, Howe Park Wood appears to have been the local stronghold for this species with regular sightings from two distinct areas of the wood between the 1980s and 2000. It then appeared to be lost from the site but was rediscovered in 2009 thanks to coordinated recorder effort. A small population remains in the north-west corner of the wood but in some years, none are seen. A previously unknown population of Black Hairstreak was discovered at Oxley Mead SSSI in 2013. Both these populations should be considered as isolated and vulnerable.

### ECOLOGY & ISSUES

The Black Hairstreak is a sedentary species, site faithful and slow to colonise new areas. This fragmentation makes the species vulnerable to genetic bottle-necking and the loss of even small colonies is therefore very detrimental to the national population.

The larvae feed only on the leaves of blackthorn and occasionally wild plum. Adults will visit the flowers of bramble, wild privet and hogweed but in common with other hairstreak butterflies, will often feed only on honeydew – the sugary secretions of aphids. This behaviour means they often keep to the shrub layer and are not easily seen by the casual observer. Hairstreak butterflies are not generally recorded on butterfly transects due to their furtive behaviour.

The species is single brooded with adults emerging in early to mid-June and flying until early July. In some years the flight season may be as short as two weeks particularly in wet summers. Eggs are laid singly on the bark between the forks of young growth (one to four years old) and older blackthorn (seven to 10 years old) twigs. The eggs remain unhatched through the autumn and winter with the larvae eventually hatching the following spring. The larvae feed on the foliage of blackthorn for approximately six to eight weeks, at which time they are very vulnerable to spiders, birds and other predators. The pupa is well camouflaged, resembling a bird dropping, but again predation in this life stage can be high.

Despite the abundance of potentially suitable mature blackthorn thickets and hedges in Milton Keynes, the Black Hairstreak has a very limited distribution. Apparently suitable areas in close proximity to known colonies do not support this insect. In the light of the huge amount of effort and time put into searching for and recording this butterfly, it is considered unlikely that many populations have been missed. However, in 2013, a single Black Hairstreak was seen flying over the blackthorn scrub at Oxley Mead SSSI and the species was recorded here again in 2014. Other 'new' colonies have been discovered elsewhere in Buckinghamshire including at BBOWT's Calvert Nature Reserve and the Salden railway cutting.

Some of the strongest populations of this insect are known from Northamptonshire, notably The Beds, Cambs and Northants Wildlife Trust's Glaphorn Cow Pastures reserve near Oundle. Here, a new approach to managing mature blackthorn, involving hedge-laying the stands rather than coppicing them, seems to have improved the condition of the blackthorn habitat and the butterfly has increased in numbers.

## CONSERVATION MANAGEMENT OBJECTIVE

To conserve and enhance the population and distribution of this species on Parks Trust land by maintaining selected stands of blackthorn scrub in sites known to have supported the butterfly in the past. To continue to monitor the known populations and continue to look for the species across its historical range in Milton Keynes.

## KEY INDICATORS

- Recorded sightings of the butterfly or early life stages.

## RECENT ACTIVITIES

- Management of blackthorn scrub at Howe Park Wood including laying of some mature stems and the removal of over-storey trees.
- Planting of blackthorn hedge at Howe Park Wood as part of post development mitigation work (2014).
- Survey and monitoring for the species at known historical sites on Parks Trust land.

## PROPOSED ACTIVITIES

- Blackthorn management to be undertaken in sequential rotation over as long a period as possible (20-40 years)
- Creation of blackthorn hedgerow connecting north-west corner of Howe Park Wood with North Bucks Way.
- Ongoing monitoring for the species at Oxley Mead SSSI and along stretch of North Bucks Way close to Oakhill Wood (where the species was last recorded in 2008).
- Lobby for appropriate treatment of the North Bucks Way where this passes through the Western Expansion Area as development is taken forward in this area.

## LEGAL PROTECTION

It is illegal to sell or barter this species under Section 9 of the Wildlife and Countryside Act 1981 (as amended)

## REFERENCES

Thomas, J. & Lewington, R. 2010. The Butterflies of Britain and Ireland.

## Species Action Plan

### SAP05 – SILVER WASHED FRITILLARY *ARGYNNIS PAPHIA*



#### STATUS

**UK BAP:** None

#### NATIONAL STATUS

Widespread and increasing in range following a long period of decline.

#### LOCAL STATUS

The population of this species in Buckinghamshire had declined significantly by 1994 (Asher) and was recorded in only five of the 10km squares in the county. It had not been recorded anywhere in the Milton Keynes area since the 1970s (Higgs, pers.com). However, this species has shown a dramatic recovery. A few individuals were recorded along the North Bucks Way by Oakhill Wood and one female seen to be egg-laying in Shenley Wood in 2009. Since then, the butterfly has been recorded in all of the local woods annually, albeit in generally low numbers. Butterfly Conservation's latest Atlas of Butterflies for Berkshire, Buckinghamshire and Oxfordshire shows that this species has enjoyed a staggering 449 per cent increase in distribution since the 1995-2004 atlas was compiled.

#### ECOLOGY & ISSUES

This is a large and impressive butterfly and the most widespread of the eight fritillary species native to England. It is a species of mature broad-leaved woodland, usually containing a high proportion of oak,

but can also be found patrolling hedgerows and country lanes close to woodland. It has always been most abundant in south-west England and south Wales.

The adults fly between late June and August each year. They will readily visit the flowers of brambles, knapweed, thistles and other plants and their powerful flight and rich golden colour make them difficult to miss in flight. An individual can cover great distances during its two to three-week lifespan allowing them to colonise new woodlands relatively quickly. Eggs are laid in July or August on the northern aspect of oak tree trunks, usually between one and two metres above the ground (occasionally as high as six metres) and in close proximity to Dog Violets. On emerging from the egg, the young caterpillar hibernates in a fissure in the bark or under moss. In spring it descends the tree and immediately seeks out the leaves of Dog Violets which are its sole food source.

The decline of this species through the twentieth century, in common with the more dramatic declines of other fritillaries, has been linked to the abandonment of coppicing in many English woodlands. The larvae's dependence on violets for food meant that they were deprived a food source in woods where violets were shaded out. A major revival in the traditional 'coppice with standards' approach to woodland management has seen a resurgence in Dog Violets which has facilitated the recovery of this species.

## CONSERVATION MANAGEMENT PRIORITY

Work to maintain and enhance the population of Silver Washed Fritillary in Parks Trust woodlands. Our current management practice of coppice with standards favours this species. Manage woodland edge habitat to create open, sunny areas where Dog Violets and nectar plants can flourish. This species and its habitat requirements are specifically referred to in our management plans for Linford Wood and Howe Park Wood.

## KEY INDICATORS

- Counts of fritillaries on Butterfly Transects at Howe Park Wood and North Bucks Way showing an increasing trend. Continued casual sightings in these and other woods such as Linford Wood and Kingsmead Spinney.

## RECENT ACTIVITIES

- Planting of Dog Violet plugs at Oakhill Wood, Shenley Wood and Howe Park Wood in 2013/2014. These violets have established well increasing the available habitat for larvae.
- Removal of conifers at Oakhill Wood to create a sunny clearing in an area known to be used by Silver Washed Fritillary.

## PROPOSED ACTIVITIES

- Continued monitoring for this species both via regular transects and specific surveys in all of our larger woodlands. We would expect to see the species increasing in numbers over the next five to 10 years.
- Continue our programme of rotational thinning, coppicing and scalloping work in our woodlands to ensure continuity of habitat for this and other butterflies.
- Retain some large stands of brambles along North Bucks Way and in woodlands at which individuals may congregate when feeding.

## REFERENCES

Asher, J & Lewington, R. 2010. *The Butterflies of Great Britain and Ireland* (Second Edition).

Asher, Bowles et.al. 2016. *Atlas of Butterflies in Berkshire, Buckinghamshire and Oxfordshire*.

## Species Action Plan

### SAP06 – SMALL BLUE *CAPIDO MINIMUS*



#### STATUS

**UK BAP:** Priority Species.

#### NATIONAL STATUS

Widespread but declining. Mainly small, localised populations in southern England and thinly distributed in Wales and Southern Scotland. The Small Blue has become all but extinct in northern England.

#### LOCAL STATUS

Most Buckinghamshire colonies are concentrated in the Chiltern hills, where it can be locally common, with a few outlying sites in Milton Keynes. The butterfly has long been found at Blue Lagoon Local Nature Reserve at Water Eaton (owned by Milton Keynes Council) and is also found in the surrounding brickworks site. Since 2006, the butterfly has been found annually at Stonepit, Great Linford. However, this is a small and vulnerable colony. The recently published Atlas of Butterflies for Berkshire, Buckinghamshire and Oxfordshire shows a modest increase (14 per cent) in 10km square occupancy for this species.

#### ECOLOGY & ISSUES

The Small Blue is the UK's smallest butterfly. The best habitats for this species are dry sheltered grasslands which support its sole larval food-plant, Kidney Vetch, together with a mosaic of tall and

short vegetation with some scrub. The main flight season for this butterfly is from mid-May until the end of June with a partial second brook in August in warm summers. Eggs are laid singly on developing flower heads in May and June. Once hatched, the larva consumes the egg shell and then feeds on the plant for much of the next year eating the developing anthers and seeds.

Previously, this species was believed to be rather sedentary but in recent years it has been shown to be a pioneering species capable of dispersing over great distances. The limestone outcrop at Stonepit Field was seeded with Kidney Vetch in 2002/3 and by 2006 the butterfly had colonised the site. The nearest known colonies are at Blue Lagoon, Bletchley approximately eight miles away. It is also known to exploit active railway lines for migration where most other butterflies and moths are found only on disused railway lines. Kidney vetch grows sporadically along the main line track in Milton Keynes and may abet the movement of this species.

By 2008 the Stonepit Field population had grown and in this year over 100 individuals were counted. Unfortunately, the creation of two large ponds on site resulted in a serious reduction of kidney vetch since when the population has declined markedly.

## CONSERVATION MANAGEMENT OBJECTIVE

To conserve and enhance the population of small blue on Parks Trust land. Manage areas of calcareous grassland appropriately for this species and increase the quantity of Kidney Vetch available for breeding.

## KEY INDICATORS

- Recorded sightings of this species. Stonepit butterfly transect to show population trend for this species.

## RECENT ACTIVITIES

- Monitoring of the species at Stonepit Field, Great Linford.

## PROPOSED ACTIVITIES

- Clearance of a large area of scrub at Elfield Nature Park to create an area of Kidney Vetch grassland.
- Sow Kidney Vetch at the former menage site in Furzton.
- Seed additional areas of Stonepit with Kidney Vetch and monitor its development and survival.

## LEGAL PROTECTION

None

## REFERENCES

Asher, J. 1994. The Butterflies of Berkshire, Buckinghamshire and Oxfordshire. Pices Publications.

## Species Action Plan

### SAP07 – AMPHIBIANS



#### STATUS

**UK BAP:** Priority Species – Great Crested Newt

#### NATIONAL STATUS

Widespread but declining. The UK supports one of the largest populations of Great Crested Newts in Europe and probably the best studied. Populations of amphibians are directly affected by the number and condition of ponds and suitable terrestrial habitat close to ponds.

#### LOCAL STATUS

Five amphibian species occur in water bodies in Milton Keynes: Common Frog *Rana temporaria*; Common Toad *Bufo bufo*; Great Crested Newt *Triturus cristatus*; Smooth Newt *Lissotriton vulgaris*; and Palmate Newt *L. helveticus*. Of these, the first four appear to be widely distributed and can be found in suitable habitat throughout Milton Keynes whereas Palmate Newt, which is generally considered a species of neutral or slightly acid soils, is much rarer and known from only one site, Elfield Park.

Great Crested Newts are common and widespread in Buckinghamshire and Milton Keynes. Any well vegetated, fish-free pond in the area might reasonably be expected to hold this species. In recent years, mitigation schemes for this species have resulted in the creation of many new ponds, some of

them incorporated within SUDS systems, which offer habitat for other amphibian species. In 2015, changes were made to the legislation protecting this species. Ponds in areas ear-marked for development will be subject to Environmental DNA testing and only those which show medium to large populations will result in mitigation plans.

In Milton Keynes, the Common Toad may be suffering a long-term decline. Toads need deeper, colder water than other amphibians in which to breed and spawn and few deep ponds remain. A survey of 30 ponds conducted by The Parks Trust in 2012 found Common Toads present in just nine, whereas Great Crested Newt was found in sixteen. As toads are strongly associated with their natal ponds and will migrate considerable distances to find these ponds each spring, the loss of such ponds can have a huge detrimental impact on local populations.

A survey of 81 ponds on Parks Trust land in 2003 resulted in 22 ponds being recorded for presence of this species. Longer term recording indicates that the species is present in approximately 50 per cent of all ponds at one time or another and where new ponds are created these are usually colonised by great crested newts within a few seasons. Anecdotal reports and discussions with members of the public show that many garden ponds and water features also hold small populations and it is likely that there are more than 100 ponds in Milton Keynes in which great crested newts breed. New populations of Great Crested Newt are discovered on our land annually and are updated on our GIS Biodiversity Alert layer.

Ponds known to support large aggregations of spawning toads include those close to Howe Park Wood Visitor Centre, the pond by the H4 to the south of Linford Wood and the larger ponds at Linford Lakes Nature Reserve.

## ECOLOGY & ISSUES

Amphibian species have suffered long term serious declines through the loss of suitable breeding ponds and the fragmentation of its terrestrial habitats. The main factors in these declines are urban development, changes to farming practices and the introduction of fish and other non-native species to breeding ponds. Some ponds are of course threatened by housing development and no species in Milton Keynes has received more attention, monitoring and mitigation than this.

Much attention is given to ponds in which newts are known to breed but equally important is the surrounding terrestrial habitat, in which the animals spend three quarters of their lives. In fact, young newts do not return to the water until they are three or four years old and sexually mature. The management of grassland, scrub, woodland, hedgerows and ditches associated with breeding ponds is likely to have a huge influence on the population. Newts and toads will be present in their breeding ponds between March and early June typically (frogs as early as February), by which time breeding should be complete. Female newts will lay up to 120 eggs on the foliage of aquatic plants. The eggs are laid singly and the leaves carefully folded over and sealed with a gelatinous secretion to hide them from predators. However, predation of eggs and young larvae can be as high as 80 per cent in certain ponds. The larvae will develop over the spring and summer, feeding on algae and small invertebrates and will eventually emerge from the pond as tiny versions of the adults in late summer/autumn. They will then forage on land to increase their body mass prior to hibernation.

Amphibians can move significant distances between their hibernation sites and ponds in the spring and autumn. Connections to the surrounding wider landscape and green corridors should be established to allow dispersal and migration between ponds. Research carried out has shown that the more ponds in a given area the greater the chances of newts being present. The optimum number of ponds is believed to be four ponds per km<sup>2</sup>.

Globally, amphibian populations are threatened by several diseases. Among the most serious is Chytridiomycosis, a fungal disease which has caused catastrophic declines in North and South American populations and is now present in Europe. It was first detected in the UK in 2008. To reduce the risk of spreading this and other diseases between populations, it is important that good biosecurity measures are taken when monitoring for amphibians e.g. sterilising all equipment and PPE between surveys.

## CONSERVATION MANAGEMENT OBJECTIVES

To maintain and enhance the condition of ponds across our landholding to maximise the available habitat for amphibians. To increase the number of ponds in areas where the amphibian populations are most vulnerable.

## KEY INDICATORS

- Recorded sightings and results of ecological surveys.

## RECENT ACTIVITIES

- Three members of staff now possess Natural England Class Licence to disturb and handle Great Crested Newts.
- Other staff and volunteers trained to identify amphibians and conduct torch counts and bottle trapping.
- Neglected or overgrown ponds restored at Linford Wood, Bancroft, North Bucks Way and other locations.
- Known breeding ponds mapped on GIS Biodiversity Alert Layer.
- Creation of hibernacula at several ponds including Howe Park Wood, Pineham and Manor Farm, Old Wolverton (2015).
- Removal of fish from several ponds at Howe Park Wood (2014).
- Acquisition of ponds specifically created for great crested newt mitigation schemes at Shenley Wood, Oxley Park, Tattenhoe Park and Broughton Atterbury.

## PROPOSED ACTIVITIES

- Ensure that Natural England best practice is followed whilst working on water bodies in which Great Crested Newt is known or suspected to be present.
- Monitoring of ponds not included in current development/mitigation recording schemes.
- Collation of newt surveys conducted by ecological consultants in connection to development projects in Milton Keynes and analysis of results.
- Leaving areas of longer grass around ponds where good terrestrial habitat is otherwise lacking.
- Change grass cutting regimes where appropriate to allow better connectivity between ponds and other habitats such as hedgerows and scrub.
- Ongoing programme of works to open up woodland ponds which are currently over-shaded and/or holding too much woody debris e.g. Hazeley Wood, Linford Wood.
- Adult education sessions focusing on Great Crested Newt ecology and conservation.
- Acquisition of Great Crested Newt mitigation scheme ponds in the Western and Eastern Expansion areas.
- Ongoing monitoring for Palmate Newt at Elfield Park.
- Testing for Chytrid disease in amphibian populations.

## Species Action Plan

### SAP08 – REPTILES



## STATUS

**UK BAP:** All native reptile species are Priority Species in the UK BAP.

## NATIONAL STATUS

National surveys (notably National Amphibian and Reptile Recording Scheme) show that populations of all native reptile species are in decline and species such as Adder are showing long term range loss.

## LOCAL STATUS

Three native reptile species are known to occur in Milton Keynes: Grass Snake *Natrix natrix*, Slow Worm *Anguis fragilis* and Common Lizard *Zootoca viviparia*. Of these, Grass Snakes are very widely distributed and can be expected to be found in rough grassy habitats along most water courses and in close proximity to lakes and ponds throughout the city. A survey in 2010 identified several small populations of Slow Worm in the north of Milton Keynes and there are one or two localised populations of Common Lizard. Reported sightings of Adder *Vipera berus* in Milton Keynes are thought to be misidentifications of Grass Snake.

## ECOLOGY & ISSUES

All three species are widespread and relatively common throughout most of the UK. Common Lizard is the most widespread of all UK reptiles occurring on most offshore islands and in Ireland. The Grass Snake has a more southerly distribution but is still found across most of southern and central England. Where it occurs, the Slow Worm is often the most abundant reptile species and is frequent in urban gardens in some areas.

Unlike our rarer species, these reptiles are more generalist in their habitat requirements. They can be found in wetlands, tussocky grassland, open woodland, hillsides and railway/roadside embankments. As it feeds primarily on amphibians and fish, the Grass Snake is rarely found more than one km from water, but the other species can be found in much drier habitats. All species are believed to be going through a period of decline caused mainly by changes to agriculture and to increasingly fragmented populations.

Locally, railway embankments would appear to be one of the key habitats for reptiles. An important site is the so called 'Railway Triangle' in North Loughton Valley Park. Here, sheltered scrubby grassland area adjacent to the mainline railway provides habitat for Slow Worm, Common Lizard and Grass Snake. It is thought likely that other reptile populations in close proximity to the railway still await discovery.

Reptiles are generally dormant through the winter months (typically early November to March) and will emerge from hibernation with the first sustained warmth in spring. On emergence, they will spend a good deal of time basking, sometimes aggregating in numbers. Once they have raised their body temperature sufficiently, they will begin foraging. Mating takes place in April and May. Lizards and Slow Worms are viviparous and will give birth to live young in late summer. Grass Snakes lay a clutch of up to 40 eggs, choosing a compost heap or decomposing tree stump as a nest site. Often, female snakes will aggregate and lay their eggs close together and these laying sites can be used over several years.

The eggs usually hatch in August or September at which time many tiny snakes can often be found before they disperse. The loss of nesting sites, often as a result of the tidying up of farmland, may be a significant factor in the decline of the Grass Snake.

Slow Worms are secretive animals and spend far less time basking in the open than other species. They too will use compost heaps both for breeding and for hibernating and they can thrive in large gardens and allotments where their habit of feeding on slugs and snails makes them a welcome ally. However, they are vulnerable to predation from domestic cats as well as wild predators including rats, hedgehogs, crows and buzzards. Where artificial refugia (such as corrugated tins or roofing felt) are set out in sites supporting slow worms, they will often use them as cover within a relatively short space of time.

## CONSERVATION MANAGEMENT OBJECTIVE

To maintain and enhance the habitat network for all three reptile species. This may include opening up basking sites in scrubby grassland, creating and managing hibernation sites and creating nesting opportunities for Grass Snakes.

## KEY INDICATOR

- Repeat surveys showing stable or increasing populations and range of these reptiles.

## RECENT ACTIVITIES

- Creation of Grass Snake nesting habitats using horse manure at Tattenhoe, Kingsmead Spinney, Walton Lake and Stony Stratford Nature Reserve.

- Translocation of Slow Worm population from private gardens in Stony Stratford to Elfield Nature Park in April 2015.
- Monitoring of reptile populations at Walton Lake, Railway Triangle, Tattenhoe and Linford Lakes Nature Reserve.

## PROPOSED ACTIVITIES

- Repeat of volunteer reptile survey undertaken in 2010, particularly looking at areas of parkland acquired since that date.
- Annual 'topping up' of habitat piles created for Grass Snakes, using a mixture of horse manure and wood chippings.
- Creation of new habitat piles as and when new populations are identified.

## LEGAL PROTECTION

All reptiles are protected under the Wildlife & Countryside Act 1981 (as amended). It is an offence to intentionally kill or injure wild animals.

## REFERENCES

Gent, A.H. & Gibson, S.D. 1998. Herpetofauna worker's manual. Joint Nature Conservation Committee, Peterborough.

Inns, Howard. 2011. Britain's Reptiles and Amphibians. WildGuides. Websites

Amphibian and Reptile Conservation Trust: [www.arc-trust.org.uk](http://www.arc-trust.org.uk)

## Species Action Plan

### SAP09 – DECLINING BIRDS IN THE URBAN LANDSCAPE



## STATUS

**UK BAP:** Priority Species

Widespread but declining.

Linnet, Yellowhammer, Reed Bunting, House Sparrow (all RSPB Red Listed)

Swift, Bullfinch (RSPB Amber Listed)

## LOCAL STATUS

The populations of many of these species have declined in the past 20 years probably as a result of overall national declines, largely in response to modern agricultural practices. Swifts and House Sparrows have undergone steep declines in this country as modern housing has effectively excluded them from their traditional nest sites in roofs. Yellowhammer has all but vanished and Linnet is very rare but is known to nest at Manor Farm Court and occasionally at other locations. Reed Bunting fairs better in Milton Keynes with most lakes and reed beds supporting at least one or two nesting pairs.

## ECOLOGY & ISSUES

The decline of once common birds such as House Sparrow, Bullfinch and Yellowhammer over the past 30 to 40 years has been dramatic and well publicised. This decline has been attributed to reduced insect and seed food availability, the wholesale loss of nesting habitat especially hedgerows, predation by wild and domestic animals and the tidying up of the rural and urban landscape. The change from winter to spring sown wheat in the UK has been cited as the single biggest cause of declines in seed eating birds, as it means that there is no stubble and spilt seed over the colder months and winter mortality is therefore much higher than in the past. Research by the Game Conservancy Trust and the BTO (British Trust for Ornithology) has established the importance of providing additional wild bird cover and forage for birds in agricultural landscapes.

A further pressure on these birds is the net decline in available nesting habitat. Agricultural and semi-urban hedgerows are often unmanaged, allowing dominant trees to take over, or managed too intensively with flailing occurring at times when birds are already looking for nest sites. Bullfinch and Linnet (and indeed other finch species) will often nest quite low in shrub beds and are vulnerable to early spring pruning. Yellowhammers nest in thick hedgerows generally in arable land and so are unlikely to nest on Parks Trust land.

## CONSERVATION MANAGEMENT OBJECTIVE

- To support and increase the populations of these bird species by increasing food availability (seed sources) and nesting opportunities sited in quiet locations away from heavy footfall and disturbance from dogs.

## KEY INDICATORS

- Sightings and records of the target species, both in breeding season and over winter.

## RECENT ACTIVITIES

- Adjustment of hedge cutting timing to leave hedges uncut for a longer period
- Introduction of dogs on lead policy in ancient woodlands to reduce potential disturbance to birds.

## PROPOSED ACTIVITIES

- Review of tree plantation management along grid roads and in linear parks to encourage development of more understorey suitable for nesting and feeding habitats.
- Management of selected areas of grassland in Stanton Low to provide overwintering seed sources.

## Species Action Plan SAP10 – WETLAND BIRDS



### STATUS

**UK BAP:** Priority Species

### NATIONAL STATUS

Widespread but in many cases declining.

### LOCAL STATUS

The population of wetland birds in the Milton Keynes area is reasonably well recorded with several Wetland Birds Survey (WeBS) counts established and many casual records from local birdwatchers and the local RSPB group and others. Lapwing, Redshank, Oystercatcher, Little Ringed Plover, Common Tern and Kingfisher all nest in Milton Keynes and there are strong populations of overwintering wildfowl such as Teal and Wigeon. Breeding waders are concentrated in the Ouse Valley with Lapwing now re-established at several sites. The relatively high number of lakes and other wetland sites in Milton Keynes means that wetland birds are probably the most intensively recorded and sites like Willen Lake and Caldecotte Lake are renowned for their spring passage. The BAP targeted species known in Milton Keynes include:

Lapwing (UK BAP Priority/RSPB Red List)  
Redshank (RSPB Amber List)

Kingfisher (RSPB Amber List)  
Sand Martin (RSPB Amber List)

Ringed Plover (RSPB Amber List)  
Green Sandpiper (RSPB Amber List)  
Garganey (RSPB Amber List)  
Gadwall (RSPB Amber List)

Yellow Wagtail (UK BAP Priority/RSPB Red)  
Marsh Tit (UK BAP Priority/RSPB Red List)  
Willow Tit (UK Priority/RSPB Red Listed)  
Reed Bunting (UK BAP Priority/RSPB  
Amber Listed)

## ECOLOGY & ISSUES

Many wetland birds have suffered a decline in numbers over recent decades. The annual BTO WeBS Count shows a marked decline in the numbers of Lapwing, Redshank, Ringed Plover and many duck species. These declines are thought to be a result of the loss of suitable breeding and wintering habitats. Wetlands declined throughout the 20<sup>th</sup> Century through drainage and agricultural improvement (especially lowland farmland). Disturbance to breeding sites is thought to be another significant factor in the decline of these birds.

Wetland birds require a mosaic of different habitats through the year including permanent and temporary water bodies with muddy margins, reed beds and large open water bodies. A key requirement for most species is an abundant source of soft bodied invertebrates, mainly earthworms, and fly and beetle larvae.

Where possible water bodies should be surrounded by large open areas of short grasses and exposed wet soils. Some light scrub can be beneficial for species such as reed bunting but larger trees should be avoided as they will encourage predatory birds and discourage wetland birds from nesting. The short sward grass should be allowed to become tussocky with grasses providing cover for species such as Lapwing, Snipe and Yellow Wagtail.

Willow Tit and Marsh Tit are wet woodland specialists. Both have declined dramatically in the latter half of the 20<sup>th</sup> Century and continue to decline. They choose dead and decaying Willow and Birch scrub for their nest sites, usually close to water. Competition with other tits species and predation from woodpeckers are believed to be contributory factors to these species decline.

## CONSERVATION MANAGEMENT OBJECTIVES

To support and increase the populations of wetland birds by maintaining and restoring appropriate habitats for these species.

To continue to improve potential nesting habitat for wetland birds by keeping islands and wet grassland areas free of trees and scrub, by maintaining areas of bare ground and gravel, and by predator control as necessary.

## KEY INDICATORS

- Sightings and records of the target species.
- Records of breeding birds at Floodplain Forest Nature Reserve.
- Numbers of winter wildfowl on Parks Trust waters.

## RECENT ACTIVITIES

- Restoration of wading bird nesting habitat at Stony Stratford and Linford Lakes nature reserves.
- Ongoing removal of mature trees at Linford Lakes Nature Reserve to open up grazing areas for wildfowl.
- Breeding Bird Surveys of Stony Stratford Nature Reserve (2012/13)
- Monitoring and ringing of nesting sand martins at Linford Lakes.

- Minerals site at Haversham Road, New Bradwell is being restored primarily for wetland birds, with nesting islands and marsh habitats.

## PROPOSED ACTIVITIES

- Restoration of sluice system at Linford Lakes Nature Reserve so that water levels can be controlled, offering better feeding habitat at key times of year.
- Construction of a large nesting bank at Linford Lakes offering habitat for breeding Sand Martins and Kingfishers.
- Continuation of scrub and tree clearance from islands at Stony Stratford, Willen Lake, Linford Lakes.
- Programme of predator control (American mink and corvids) at Linford Lakes and other sites as necessary.
- Winter Bird Surveys at key sites.
- Create more foot-drains and ditches in wet grassland areas at Stony Stratford and Linford Lakes nature reserves.
- Establish a research project into nesting preferences and ecology of Marsh and Willow Tits at Linford Lakes Nature Reserve.

## LEGAL PROTECTION

All wild birds, their nests and eggs are protected by the Wildlife and Countryside Act 1981, as amended.

## Species Action Plan

### SAP11 – BIRDS OF PREY (INCLUDING OWLS)



#### STATUS

**UK BAP:** None

#### NATIONAL STATUS

Many raptor species are currently in a period of recovery following many decades of decline. However, Hen Harriers are now close to extinction in England and Kestrel and Little Owl are experiencing national declines.

#### LOCAL STATUS

Seven species of raptor and owl are resident in Milton Keynes. Not all breeding sites for these species are known. However, Sparrowhawk is now a very common sight; Buzzards and Red Kites can be seen on a daily basis; and Peregrine nested successfully for the first time in 2015. In addition, Hobby is an annual summer visitor and has bred locally, Short-eared Owl is an irregular but increasing winter visitor and Marsh Harrier, Merlin and Osprey all occur annually on passage.

#### ECOLOGY & ISSUES

Most birds of prey suffered a decline in numbers through the 20<sup>th</sup> Century. This decline was largely a result of agricultural intensification and the use of pesticides such as DDT after World War II. Although most species are now in recovery (in some cases dramatically so) others remain restricted due to the overall reduction in suitable habitat such as rough grassland, scrub and winter stubble

which provide habitat for their prey species. Undermanaged roadside verges now often provide the most suitable foraging habitat for species such as Buzzard, Kestrel and Barn Owl. Nationally, birds of prey suffer from illegal persecution. Hen Harrier and Red Kite, for example, fall victim to poisoning due to their habits of taking Red Grouse and poultry respectively. Despite enjoying a steady increase in range and numbers, the Peregrine is unpopular with pigeon keepers as inevitably some domesticated pigeons are preyed upon.

## CONSERVATION MANAGEMENT OBJECTIVES

To support and increase the populations of birds of prey by maintaining and restoring appropriate habitat and conditions for these species.

To maintain and enhance sites offering suitable habitat by:

- Improving the floristic and structural diversity of grasslands through the varied cutting regimes, including retaining uncut grass margins and larger areas of rough grassland throughout the winter to support rodent populations.
- Enhancing nesting opportunities through the provision of nest boxes for target species.

## RECENT ACTIVITIES

- Assessment of the overall provision of nest boxes including recording of their location and condition.
- Provision of twelve new nest boxes for Barn Owls and replacement of Tawny Owl boxes at Shenley, Linford and Howe Park Woods.
- Setting up an annual inspection and monitoring programme for Barn Owls.
- Developing a partnership project with MK Dons F.C. to monitor the breeding Peregrines at the Stadium.

## PROPOSED ACTIVITIES

- Leaving some areas of rank vegetation at sites known to attract foraging raptors e.g. Stanton Low, Linford Lakes, North Willen Lake.
- Installation of new/replacement nest boxes for Tawny Owls in ancient woodland and other parkland sites.

## LEGAL PROTECTION

All birds of prey are protected by the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to kill, injure or take a bird or to take, damage or destroy an active nest or its contents.

The Barn Owl is listed on Schedule 1 of WCA making it illegal to disturb a nest site without a licence.

If a licence is required for ringing or taking part in a nest recording scheme then applications need to be made to the British Trust for Ornithology.

# Species Action Plan

## SAP12 – EUROPEAN BADGER *MELES MELES*



### STATUS

**UK BAP:** None

### NATIONAL STATUS

Common and widespread. Nationally the badger population is increasing in most areas.

### LOCAL STATUS

Undoubtedly badgers have undergone much disturbance and a decline in numbers as Milton Keynes has developed over the past 40-50 years. A number of active setts were closed down ahead of development most notably in the 1980s. There have been regular annual, and at times, quarterly surveys of known badger setts across most of the city since the 1980s so most badger sett locations are known. However, new setts are discovered from time to time, usually annex or outlier setts associated with a main sett.

There are few badger setts in the central part of Milton Keynes, probably in reflection of it being a more heavily developed area. However, there remains a good number of setts in the eastern and western flanks of Milton Keynes, most of which are associated with woodland or hedgerows.

### ECOLOGY & ISSUES

Badgers are a widely distributed species found across much of Europe and into Asia. They are habitat generalists and can do well in woodland, wetlands, grasslands and even fairly intensively farmed arable land. In the UK they are nocturnal and live in fairly small social groups. These social groups or 'clans' will have established territories that they patrol and defend from other badger groups. Territory size depends on quality and richness of the local habitat and can range anywhere from 20 to 175 Ha in extent. They mark their territory with dung piles (latrines) and scent marking.

Badgers are omnivorous, feeding on a great variety of plant and animal food and their diet changes markedly with the seasons. Earthworms can account for 50-65 per cent of a badger's diet at certain times of year but they will also feed on cereal crops, berries, fruit, fungi, slugs and snails, small mammals, birds' eggs and amphibians. The increasing badger population has been cited as a possible cause of the decline in the UK's hedgehog population.

Badgers are well known for their ability to create large and complex burrow systems known as setts. The fresh excavations of badgers are usually easily detected and are often the first indication of a 'new' badger population. Other field signs easily found include dung pits, footprints and hairs, which may be caught on barbed wire at field boundaries.

Badgers are site faithful with some setts in constant use by badger clans for decades or centuries. Even once excluded from a sett area, badgers have been known to re-open a sett at the same location within days. The badger's main breeding season is in autumn and early winter with young generally born in January or February. Gestation lasts for seven weeks after which the sow gives birth to between one and four cubs. The cubs become dependent at four months old.

Badgers are now commonly associated with Bovine TB and since 2013 the UK Government has been carrying out a culling programme in Gloucestershire and Somerset. In 2015 it was announced that the cull would be extended to other counties.

## CONSERVATION MANAGEMENT OBJECTIVE

To conserve and monitor the badger population on Parks Trust land.

## KEY INDICATORS

- Results of quarterly badger sett surveys carried out in-house.

## RECENT ACTIVITIES

- Training of Parks Trust staff to carry out regular quarterly surveys of setts on our land.
- Creation of GIS biodiversity alert layer showing geographical locations of known badger setts.
- Badger awareness training provided to Parks Trust contractors.

## PROPOSED ACTIVITIES

- Record new badger setts (or suspected setts) and arrange confirmation inspections by a qualified person.
- Bait marking experiments to ascertain boundaries of sett territories and measure interaction between associated setts (Parks Trust staff)
- Any new planting/landscaping in close proximity to badger setts should include habitat enhancement measures such as the planting of fruit and nut trees and other scrub planting with fruit bearing species.
- Walkover surveys of all newly acquired pieces of land to locate previously unknown setts.
- All works in sites holding badger setts will follow the Badger Best Practice Guidelines.

## LEGAL PROTECTION

The Protection of Badgers Act 1992 makes it an offence to take, injure, kill, sell or mark a badger or to interfere with a badger sett. Exceptions are provided for within the act and licences can be sought from Natural England.

## Species Action Plan

## SAP13 – EUROPEAN OTTER *LUTRA LUTRA*



### STATUS

**UK BAP:** Priority

### NATIONAL STATUS

Stable and increasing. Following a long period of decline through the 20<sup>th</sup> Century, the otter has undergone a nationwide recovery and is now known to have reoccupied every county in England and Wales (The Mammal Society, 2013). The increase in the otter population and distribution has surpassed the 2015 UK BAP target.

### LOCAL STATUS

In common with the rest of England the otter population in North Bucks declined in the 1950s to 1970s and the otter had completely disappeared by 1980. However, in the last 10-15 years the species has recolonised. Records first appeared in the Ouse Valley early in the 21<sup>st</sup> Century but there are now records from both main rivers as well as smaller watercourses, lakes and ponds throughout the city. Road kill otters are relatively frequent in Milton Keynes with two to three found in most years, indicating a growing population. Estimating otter numbers is notoriously difficult as dog otters can have territories up to 40 miles long but will occasionally overlap with other males.

### ECOLOGY & ISSUES

As an apex predator of freshwater habitats, otters are considered to be a good biological indicator of water quality for rivers and streams. Otters are naturally shy creatures and rarely seen during daylight hours (although sightings during the day are often made at nature reserves and other quiet locations). They are broadly nocturnal or crepuscular in nature, foraging in and around water bodies for fish, crayfish, invertebrates and a wide range of other animal prey. However, they are not as tied to watercourses as is often believed and will stray up to 1.5 km away from rivers to feed. At such times, they may enter balancing lakes, fish ponds and even garden ponds in search of food.

Otters require undisturbed areas of usually dense scrub or vegetation in which to make holts (underground shelters). They will sometimes use bank-side tree roots and dig beneath them and

occasionally will climb willow pollards in search of resting places. They are non-seasonal breeders and a female may produce young at any time of year with a litter of between one to four cubs, but most litters are produced in summer. Cubs remain with their mother for around 13 months, but the adult male has no association with the female after breeding.

Otter sign includes spraints (droppings) which are generally left in prominent positions on stones or under bridges, feeding remains (half eaten fish or crayfish) and tracks in soft wet mud. All of these signs are relatively easy to find with practice.

All works carried out to watercourses should take into consideration the potential presence of otters through survey and habitat assessment, the sympathetic timing of works and safe methods of working.

The increasing and more evident otter population is often blamed by the angling community for depleted fish stocks and in some cases otters are believed to have caused serious damage to fisheries throughout the UK. However, analysis of otter spraints locally suggests that many individuals prey mainly on Signal Crayfish only switching to fish in the colder months when crayfish are dormant.

## CONSERVATION MANAGEMENT OBJECTIVE

- To maintain and enhance the available riparian habitat for otters.

## KEY INDICATORS

- Records and observations of otter activity (volunteer surveys)
- Casual observations of otter field signs, for example under bridges.

## RECENT ACTIVITIES

- Installation of pipe and chamber otter holts at various locations including Passenham, Stony Stratford, Caldecotte Lake and Pineham. (HLS Capital Item OH2)
- Volunteer Survey carried out between 2009-2012 identified otter sign at various locations on North Loughton Brook for the first time.

## PROPOSED ACTIVITIES

- Maintain a database of all sightings of otters on Parks Trust land.
- Maintain areas of riverside scrub and tall vegetation as cover for otters.
- Ensure that all crayfish trapping carried out on Parks Trust land (by licence) meets required standards of Environment Agency to avoid risk of otter drownings.

## LEGAL PROTECTION

Otters are fully protected under The Conservation of Natural Habitats and Species Regulations 2010 and Wildlife and Countryside Act 1981 (as amended). It is illegal to capture, injure or kill a European Protected Species or damage/destroy their breeding places and foraging places.

## Species Action Plan

### SAP14 – BATS (PREVIOUSLY NOCTULE BAT)



#### STATUS

**UK BAP:** The following species are identified as Priority Species: Brown Long-eared Bat; Noctule Bat; Barbastelle; Bechstein's Bat; Greater Horseshoe; Lesser Horseshoe; Soprano Pipistrelle.

#### NATIONAL STATUS

All 17 species of bat native to the UK are known to have suffered declines throughout the 20<sup>th</sup> Century. Some species, such as Noctule Bat *Nyctalus noctula*, appear to have stabilised or have increasing populations while others continue to decline (Bat Conservation Trust, 2014).

#### LOCAL STATUS

The following bat species are known to occur in Milton Keynes and its environs: Common Pipistrelle *Pipistrellus pipistrellus*; Soprano Pipistrelle *P.pygmaeus*; Noctule Bat *Nyctalus noctula*; Brown Long-Eared Bat *Plecotus auritus*; Daubenton's Bat *Myotis daubentonii*; Natterer's Bat *M.nattereri*; barbastelle *Barbastella barbastellus*. In 2014 a single Serotine Bat *Eptesicus serotinus* was found in Ouzel Valley Park. Since 2011, North Bucks Bat Group has undertaken a study of the very rare Bechstein's Bat *Myotis bechsteinii* at Finemere Wood and the surrounding countryside near Winslow. It is possible this woodland specialist species is present in or close to Milton Keynes.

## ECOLOGY & ISSUES

Knowledge of bat populations and in particular bat roosts in Milton Keynes has grown considerably in recent years. For example, maternity roosts have been identified for Noctule Bat in Shenley, Kingsmead and Howe Park Woods, for Daubenton's Bat in Great Linford and Pineham and for Soprano Pipistrelle in New Bradwell. All known bat roosts are mapped on our GIS Biodiversity Alert Layer.

For tree roosting species such as Noctule Bats, tree felling can pose obvious threats. Quite apart from the risk of felling a tree containing roosting or breeding bats, roost trees which are left exposed to northerly winds or artificial light will quickly be abandoned.

Bat roosts are vulnerable to external factors such as public access, disturbance and lighting. Any works carried out to trees should take into consideration the potential presence of bats through tree inspections, timing of works and methodology. Proposals for forestry operations should consider the potential impacts to bats at an early stage. Key actions include:

- Undertaking initial inspections of trees at an early stage to assess potential habitat suitability and to search for signs of bats.
- Where a potential for bat presence is identified, detailed surveys by a licensed bat worker should be undertaken with recommendations that either remove the potential risk to bats or provide options for mitigation and compensation that will be subject to European Protected Species licensing.
- Known tree roosts will be colour marked to indicate their use by bats.
- Create/retain standing deadwood in woodlands to provide roosting habitat for bats and habitat for their insect prey species.

Bat box schemes have been introduced to several parks and woodlands owned by The Parks Trust, as well as a mitigation scheme at Manor Farm Court (converted farm outbuildings). Linford Lakes Nature Reserve, acquired in 2015, had already had 24 boxes installed some years earlier but no data on their use by bats is available. It is important that long term monitoring is undertaken to measure their use by bats and that the boxes are maintained and where necessary replaced.

## CONSERVATION MANAGEMENT OBJECTIVES

- To maintain and enhance the range and diversity of habitats and roosting opportunities suitable for bats across The Parks Trust's land.
- To protect and conserve known bat roosting and foraging areas and enhance opportunities for bats in these areas.

## KEY INDICATORS

Records of all bat species in Milton Keynes to be kept and shared with Buckinghamshire & Milton Keynes Environmental Records Centre (BMERC)

## RECENT ACTIVITIES

- Monitoring of bat box schemes at Manor Farm Court, Shenley Wood, Kingsmead Spinney and Linford Lakes Nature Reserve.
- Participation in National Bat Monitoring Programme's Waterway Survey in 2015.
- Purchase of sound analysis equipment and software to assist with bat identification and recording.

- Code of Practice produced for tree work which may impact on bats.

## DESIRABLE ACTIVITIES

- Monitoring of bat boxes at Howe Park Wood and Elfield Nature Park (contract).
- Increased local awareness of bat conservation through THE Trust's educational work e.g. bat walks and talks (number of bat walks organised for 2016).
- In partnership with North Bucks Bat Group, initiate ringing programme for bats using boxes in our woods.
- Further monitoring of Daubenton's Bat roost at Pineham.

## LEGAL PROTECTION

In the UK all bats and their roosts are fully protected by the following legislation:

Wildlife and Countryside Act 1981 (as amended)

Countryside and Rights of Way (CRoW) Act 2000

Natural Environment and Rural Communities (NERC) Act 2006

Conservation of Natural Habitat and Species Regulations 2010

## Species Action Plan

### SAP15 – WATER VOLE *ARVICOLA AMPHIBIUS*



#### STATUS

**UK BAP:** Priority Species.

#### NATIONAL STATUS

Considered to be the UK's fastest declining mammal species. Formerly common throughout Britain. The Vincent Wildlife Trust conducted two national Water Vole surveys in the 1990s showing an overall national decline of 88 per cent (Jefferies, 1998).

#### LOCAL STATUS

Water Voles were a common sight along watercourses around Milton Keynes until around 1990. They were particularly associated with the River Great Ouse, the Grand Union Canal and the Loughton brook. However, following the national trend, numbers declined sharply and the species appeared to have disappeared from the area by 2000. Recently there have been several confirmed sightings along the River Great Ouse and the Loughton area.

## ECOLOGY & ISSUES

Water Voles are riparian mammals that typically inhabit the banks of rivers, streams, canals and ditches. They can also be found in ponds and marshes. Although not particularly well adapted to water they are adapted to digging and are able to dig extensive burrow systems. They usually have at least one burrow exit below the water surface to allow escape from their many predators, which include herons, owls, mink, otters and domestic cats. They are also known to exploit reed beds, where instead of tunnelling they build tightly woven nests as the base of reeds or sedges.

Water Voles are herbivorous, feeding on a wide variety of grasses, sedges, rushes, flowers and fruits. In fact, over 200 plant species have been recorded in their diet (Strachan, 1997). They mark their territory with clearly visible latrines and these, together with the very distinctive feeding remains left by the Voles, are important indicators in surveying for the species.

Numerous factors have contributed to the national decline of the Water Vole, including habitat degradation (largely by river engineering), pollution, fluctuating water levels and predation by introduced American Mink *Neovison vison*. Locally, there has been very little change in the available habitat for Water Voles and the increased population of Mink is the most likely cause of the Vole's rapid decline.

## CONSERVATION MANAGEMENT OBJECTIVE

To maintain and increase the amount of available habitat for Water Voles to encourage their recovery in the local area.

## PROPOSED ACTIVITIES

- Survey all sites known to support Water Vole historically between 2013-2015 to establish presence/absence and produce a report of results.
- Install rafts in ditches and smaller watercourses to ascertain presence of Water Voles.

## DESIRABLE ACTIVITIES

- Control of American Mink in sites which may support Water Vole.
- Where bankside erosion is occurring, use soft engineering techniques, such as willow spiling, to stabilize them.

## ENVIRONMENTAL STEWARDSHIP ELS AND HLS OPTIONS

- EB6, Ditch management.
- EE10, 6m buffer strips on intensive grassland next to watercourse.
- HB14, management of ditches of very high environmental value.

## LEGAL PROTECTION

The Water Vole is now fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly kill, injure, possess or trade in Water Voles. It is also an offence to intentionally or recklessly damage or obstruct access to any structure that Water Voles use to shelter or breed.

## REFERENCES

Strachan R. 1997, British Natural History: Water Voles (Whittet Publishing 1997)

Jefferies D.J. 1998, The Water Vole and Mink Survey of Britain 1996-1998 (Vincent Wildlife Trust)