Biodiversity Action Plan

LONDON BOROUGH OF
RICHMOND UPON THAMES

Executive Summary

This document is the culmination of many years' work by many organisations and charities, including the London Borough of Richmond upon Thames, London Natural History Society, London Wildlife Trust, Royal Botanic Gardens Kew, The Royal Parks, Thames Landscape Strategy and Wildfowl & Wetlands Trust, professional bodies, communities and local residents within the borough.

The Local Biodiversity Action Plan (LBAP) in Richmond sets out the strategic context of biodiversity, which was first raised at the Rio Summit in 1992. This led to the development of a UK Biodiversity Action Plan, which has raised public awareness of biodiversity and provided guidance on the preparation of Local Biodiversity Action Plans.

This Local Biodiversity Action Plan for the London Borough of Richmond upon Thames sets out the framework for the protection, conservation and enhancement of wildlife within Richmond upon Thames. LBAPs are seen as an innovative approach to wildlife conservation as they are moving away from the traditional 'naturalist' approach, which to many appears elitist and unwelcoming, and are striving to broaden the constituency of those interested and involved. It is a widely held belief that making a Biodiversity Action Plan relevant to local people through active involvement and consultation will ensure pro-active action 'on the ground'.

The list of habitats and species in this plan is not exhaustive, although the Richmond Biodiversity Action Plan aims to concentrate on and prioritise those habitats and species, which are rare, in decline, or characteristic of Richmond, which will help raise the profile of biodiversity.

The priority habitats within this borough, which are also of regional and national importance, are: Acid Grassland, Ancient Parkland/Veteran Trees, Broadleaved Woodland, Reedbeds and Tidal Thames.

The priority species, which are also of regional, national and international importance, are: Bats, Mistletoe, Song Thrush, Stag Beetles, Tower Mustard and Water Voles.

The key to the success of these Action Plans is their implementation. We are fortunate in this borough to have the support of many local groups, individuals, statutory agencies and land managers who work together to play an important role in the protection and enhancement of these species and habitats. This Plan sets out the practical ways in which each person can play their part in the Biodiversity Action Planning process. However, the list of partners is not exclusive and new partners are both welcome and needed.

Biodiversity is the borough's prime natural asset. We want to encourage everyone to work in partnership to conserve and enhance the rich diversity of habitats and species and ensure they are protected for the benefit and enjoyment of future generations, so that this borough remains rich in wildlife and a green and pleasant land.

Acknowledgements

I would like to thank all the members of the Richmond Biodiversity Group who have contributed and helped to compile this Biodiversity Action Plan for Richmond upon Thames. I am grateful for everyone's enthusiasm, efforts, time, help and support in putting this document together and I look forward to maintaining the working relationships with all the partners and having their continued support and dedication to ensure that the actions within each of the Habitats and Species Action Plans will be implemented in the forthcoming years.

I would also like to thank the Royal Botanic Gardens Kew, Richmond Park and Richmond LA21 for their kind contributions towards the publication of this Biodiversity Action Plan.

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PLANTS PEOPLE POSSIBILITIES

THE wildlife TRUSTS
London Wildlife Trust

BTCV

FORCE
Friends Of the River Crane

A Better Borough For A Better World

ENVIRONMENT TRUST FOR RICHMOND UPON THAMES

THE Friends OF Barnes Common

PEOPLE'S TRUST FOR ENDANGERED SPECIES

Thames Water

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ENGLISH NATURE

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London Biodiversity Partnership
working together for wildlife

LONDON BOROUGH OF RICHMOND UPON THAMES

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1. Introduction

1.1. What is Biodiversity?

"*Biodiversity, is the biological diversity of life in all its different forms*."

Biodiversity, or biological diversity, is the 'variety of life' - the myriad plant and animal species and the range of habitats in which they live and the natural processes of which living things are a part. This includes the living organisms and the genetic differences between them and the communities in which they occur.

Understanding the biodiversity of the world, both locally and globally, can demonstrate the wealth of species and natural varieties that are present, and ultimately, the health of the natural world that we all depend upon and enjoy. Maintaining and developing a natural balance between different life forms, of both plants and animals, in a sustainable way, is one of the most important aspects of conservation. A main aim of biodiversity conservation is to ensure that all life forms 'prosper' through sympathetic, sustainable management, for future generations to share.

1.2. Biodiversity and Sustainable Development

Sustainable development is often defined as *"development that meets the needs of the present without compromising the ability of future generations".* Biodiversity and sustainable development are inextricably linked, as the wealth of species and habitats can be seen as an indicator of our environment and general well being. There is considerable evidence that highlights there has been a considerable decline in biodiversity on a global, national and local scale over the years, which is why Biodiversity Action Plans are considered so important, as they are an aid to reverse this decline and help conserve, protect and enhance species and habitats that are rare, in decline, of importance and of value locally.

Unless we reverse current declines in biodiversity, future generations will inherit an impoverished world. We are dependent upon the global biological resource for survival - the air we breathe, the water we drink and the food we eat ultimately depend upon natural processes. Natural processes provide 'services' humans could not replace such as flood control. Genetic information from wild species provides an invaluable resource for food and medicine. Changes in species numbers and habitat quality can provide an indicator of environmental change, giving us early warning of harm or damage to the natural environment.

1.3. What is a Biodiversity Action Plan?

A Biodiversity Action Plan (BAP) is an evolving strategy and delivery mechanism for the conservation of biological diversity and the sustainable use of biological resources. The BAP will list details of prioritised actions for protecting, conserving and enhancing those species and habitats within Richmond that are of importance and of local value. The list of species and habitats also reflect and support those contained within the London and UK Biodiversity Action Plans. It will involve a number of local groups, individuals and organisations to monitor the biodiversity within the borough and help gauge the quality of our environment through the indicators provided by the success of the habitats and species supported. The LBAP aims to protect and celebrate the wildlife in Richmond through a series of actions in order to improve the overall environment and contribute to enhancing biodiversity within the London Borough of Richmond.

1.4. Why we need to conserve Richmond's biodiversity?

In recent history, there is considerable evidence that on a global, national and local level, biodiversity has significantly declined. In Richmond Borough, there are ever-increasing demands on land for new housing, industry, commerce and recreation, which have resulted in habitats being

constantly threatened, with the abundance of species diminishing. Wildlife in London still faces major challenges from the demands of a growing and more compact city; lack of resources to manage sites and habitats, and lack of awareness of the value of conserving biodiversity in an urban environment. In Richmond, we need to conserve these complex and dynamic systems which support a wide range of fauna and flora, many of which, for example the Skylark, are threatened on a local and global scale. Conservation of the Skylark shows how through conserving our local biodiversity we can make a difference on a much wider scale, which is a true example of "*Think Globally, Act Locally*".

In order to conserve Richmond's biodiversity, we need to reverse the decline of species and habitats and ensure through the LBAP that proactive conservation is undertaken by all sectors of the community, as The UK Biodiversity Action Plan recognised that "*biodiversity is ultimately lost or conserved at the local level",* which further stresses the importance of having a Local Biodiversity Action Plan for Richmond upon Thames.

2. The History of Biodiversity in Britain

2.1. International Action - The Earth Summit

In Rio de Janeiro in 1992 the largest gathering of world leaders met for the UN Conference on Environment and Development, demonstrating that environmental concerns had become a high priority on the world's political agenda. At the Summit an agreement was drawn up, known as the Agenda 21 directive (LA21). LA21 is now a pro-active programme in Britain, working from 'the bottom up' to achieve sustainable patterns of development in all aspects of life.

As part of the International Agreement on Sustainable Development ("Agenda 21"), over 167 nations, including the UK, signed up to the 'Convention on Biological Diversity of Species and Habitats', agreeing that direct action must be taken to halt the extinction of the world's biodiversity.

2.2. 10 years on from The Earth Summit – The Johannesburg Summit, 2002

Progress since the 1992 Earth Summit has been disappointing, with poverty deepening and environmental degradation worsening. The Johannesburg Summit was held in 2002 and it laid the groundwork and paved the way for action. Johannesburg gave a solid basis for implementation and action to go forward, as the Plan of Implementation is more targeted and more focused than Agenda 21.

Global priorities for action were agreed and it was agreed to take action. Commitments were made in Johannesburg including protecting biodiversity and improving ecosystem management, not only by governments, but also by Non Governmental Organisations (NGOs), intergovernmental organisations and businesses, who launched over 300 voluntary initiatives.

2.3. National Action – The UK Biodiversity Group

In December 1993, a number of conservation organisations published a report entitled *Biodiversity Challenge: An Agenda for Conservation Action in the UK*. Consequently, two further documents were produced in the UK, which outlined the nation's commitment to biodiversity. The UK was one of the first countries in the world to respond to the Biodiversity Convention, which is documented in *Biodiversity: The UK Action Plan*, which was launched in 1994.

Subsequently, the National Biodiversity Steering Group was established and in 1995 published a two-volume document *Biodiversity: The UK Steering Group Report*, which contained:

- Targets and costed action plans for key habitats such as Reedbeds, which occur in the borough at Leg O' Mutton Reservoir Local Nature Reserve and the London Wetland Centre, and our most threatened species such as Water Voles, which are found in the borough along the River Crane and Longford River, which needed protection and action across the UK.
- Proposals for a UK biodiversity database with the establishment of a network of Local Record Centres.
- Recommendations for raising public awareness of biodiversity.
- Proposals for action at the local level, including guidance on preparing Local Biodiversity Action Plans (LBAPs).

The Government endorsed the report of the UK Steering Group in April 1996. In 1997, the Steering Group, now named the UK Biodiversity Group, produced guidance notes for the production of LBAPs. It was recognised from the onset that the success of the national document relied on the production of LBAPs, which detailed particular requirements of local biodiversity and were put together by a partnership of local organisations, charities and people.

2.3.1. Working with the Grain of Nature: A Biodiversity Strategy for England

DEFRA (Department for Environment, Food and Rural Affairs) produced *Working with the grain of Nature: a biodiversity strategy for England* in 2002 in partnership with a broad range of stakeholders in the public, voluntary and private sectors. The Strategy seeks to ensure biodiversity considerations become embedded in all main sectors of public policy and sets out a programme for the next five years to make the changes necessary to conserve, enhance and work with the grain of nature and ecosystems rather than against them.

The Strategy sets out a series of actions that will be taken by the Government and its partners to make biodiversity a fundamental consideration in:

- **Agriculture:** encouraging the management of farming and agricultural land so as to conserve and enhance biodiversity as part of the Government's Sustainable Food and Farming Strategy.
- **Water:** aiming for a whole catchment approach to the wise, sustainable use of water and wetlands.
- **Woodland:** managing and extending woodland to promote enhanced biodiversity and quality of life.
- **Marine and Coastal Management:** to achieve the sustainable use and management of our coasts and seas using natural processes and the ecosystem-based approach.
- **Urban Areas:** where biodiversity needs to become a part of the development of policy on sustainable communities and urban green space and the built environment.

2.4. Regional Action - The London Biodiversity Partnership

In September 1996, the London Biodiversity Partnership (LBP) was established in conjunction with a prospectus (*Capital Assets*) for biodiversity in Greater London. The partners include a wide variety of environmental organisations, the private sector, London Boroughs, major landowners and corporate organisations to support the implementation of this regional strategy. London Borough of Richmond-upon-Thames is represented and proactive in this partnership, being the Lead for London's Tower Mustard Species Action Plan. This cross section approach is seen as an essential requirement for achieving effective biodiversity conservation.

There are four topic groups reporting to the Project Board, which is chaired by the Greater London Authority (GLA). The Project Board provides the overall steer for the Partnership's activities and co-ordinates the 4 decision-making groups, which are as follows:

- *Communications Working Group to promote the Biodiversity Partnership and increase communications about the Biodiversity Action Planning process*
- *The Habitats Species and Data Working Group to update and review London's Biodiversity Action Plans for priority habitats and species in the capital and to update the audit*
- *Management Working Group*
- *Biodiversity Records Centre Working Group*

The first Biodiversity Project Officer was appointed in 1999, with the role of overseeing the London Biodiversity Partnership. The Partnership is strengthened by the London Boroughs Biodiversity Forum (LBBF), which was set up so officers involved in nature conservation from each London Borough could discuss issues, share experiences and gain knowledge about developing and implementing a Local Biodiversity Action Plan, which would ultimately contribute to achieving the actions and goals within the London BAP.

In January 2000 the London Biodiversity Partnership published Volume 1 of the London Biodiversity Action Plan, 'The Audit', which takes stock of London's priority habitats and species, and provides an assessment of their status, threats and needs. 'Our Green Capital' was also published in 2000, as a follow on to *Capital Assets* (1996), and as a companion to 'The Audit' and introduction to the Partnership's work.

The first 'round' of Action Plans were published in 2001, as Volume 2 of the London Biodiversity Action Plan - 'The Action', which identified 20 habitat or land use types that cover most of London where biodiversity could be enhanced. A second round of Action Plans were added in 2002, a third in 2004 and a fourth in 2005. The London Biodiversity Partnership now manages the implementation of 31 Action Plans altogether: 11 Habitat Action Plans, 12 Species Action Plans and 8 Generic Action Plans covering crosscutting issues. There are also Statements for private gardens, the house martin, 'humble bumble' and London's exotic flora.

The process from audit to action has involved a wide range of individuals and organisations, but the London BAP helps to strengthen the LBAPs across all the boroughs in London.

In July 2000, the Mayor of London published the Mayor's Biodiversity Strategy, which was the first statutory strategy of its kind in the UK. It sets out the Mayor's vision to maintain London's biodiversity as a crucial part of a sustainable world city with 14 policies and 72 proposals to implement the policies, listing the main partners including national organisations and all London Boroughs who can ensure the policies can be proactively achieved on the ground. The policies set out the key principles that LBAPs are an innovative way to involve key stakeholders and members of the public to ensure priority habitats and species are protected and enhanced at a local level**.** The Strategy also encourages and supports the production and implementation of Local BAP's as an integrated element of Community Strategies.

2.5. Local Action - The Richmond Biodiversity Group

In 1996, as part of the Local Agenda 21 process the Richmond Biodiversity Group was formed, which comprised of representatives from the London Borough of Richmond upon Thames, London Ecology Unit, London Natural History Society, London Wildlife Trust, Royal Botanic Gardens Kew, The Royal Parks, Thames Landscape Strategy, Wildfowl & Wetlands Trust and other local groups and interested residents.

In 1999 the partnership drew together a 'consultative framework', which included a list of the species and habitats believed to be priorities for conservation concern in the local area. Priorities were selected by considering a number of factors, including those which are considered nationally important, such as skylarks and stag beetles, those which are particularly attractive to people such as bumblebees and water voles, or those which are characteristic to Richmond, such as the tidal Thames and acid grassland.

The Framework was open to public consultation, through press releases, questionnaires in libraries and publicity at local events, between September 1999 and March 2000. Following the production of the Framework, there continued to be considerable work done to further the LBAP process, such as the annual garden survey, which encouraged local residents to collect data on the wildlife that lives or visits their gardens, which not only raised awareness of biodiversity but highlighted the importance of encouraging wildlife into gardens.

2.5.1. Local Groups Forum

In March 2000 the Partnership decided to pursue the development of a 'Local Groups Forum' to entice local interest and involvement in the LBAP process. The aim of the Local Groups Forum was to actively involve local groups in drawing up the individual Species and Habitat Action Plans that form the main content of an LBAP. The Local Groups Forum was also seen as a good way of channelling and utilising people who approached the Partnership expressing a desire to become involved with the BAP process but did not necessarily wish to attend Partnership meetings.

2.5.2. The Wildlife 2000 Project

Generating public interest in local biodiversity was approached through the Wildlife 2000 project as part of the LBAP process. Wildlife 2000 was a lottery-funded project to promote the importance of biodiversity in 6 Southwest London Boroughs. With Richmond as the lead, Sutton, Merton, Kingston, Hounslow and Wandsworth promoted the ethos of biodiversity, in a manner, which was accessible to everyone, with the aim of promoting biodiversity as a well understood 'household' word. The aim was to increase public awareness of biodiversity issues through a programme of themed events and the Wildlife 2000 Project targeted a section of the community who had not previously expressed an interest in biodiversity.

2.5.3. The SUN Project 2003 - 2006

The SUN Project is a 3-year initiative funded by the EU LIFE Environment programme to increase awareness of wildlife conservation issues and involve the wider community in planning for wildlife, through the Biodiversity Action Planning process. The SUN project is a partnership of 7 organisations, which includes the London Borough's of Richmond, Redbridge, Sutton and Bromley, CIP, Global to Local and Legambiente; an Italian NGO.

Like the Wildlife 2000 Project, many workshops, events and training days have been held in conjunction with the SUN initiative to raise awareness of the importance of having a LBAP for Richmond and to increase the number of stakeholders involved in the Richmond Biodiversity Action Planning process. A number of innovative projects have taken place across the borough,

which relate to specific actions noted in the Species and Habitat Action Plans, such as installing stag beetle nest boxes in Richmond Park and creating new reedbeds.

2.6. The Importance of People

A broad partnership is important in the production and implementation of any LBAP, as local groups and organisations can be brought together to share expertise, knowledge, resources and responsibilities. Representation of organisations operating within the borough are particularly important as successful LBAPs need to consider the views of those who have the most influence upon local biodiversity. An effective partnership also needs to involve the general public as well as key players such as landowners and managers. The involvement of the general public is essential from the start of any LBAP process, as without public support, attempting to translate the LBAP from a document into pro-active conservation action on the ground will be a futile task. Raising awareness is a positive process for two main reasons:

- Firstly, heightening people's appreciation of their local environment will generate a feeling of long term stewardship and,
- Secondly, increased awareness may reduce incidences of unintentional damage or disturbance through ignorance.

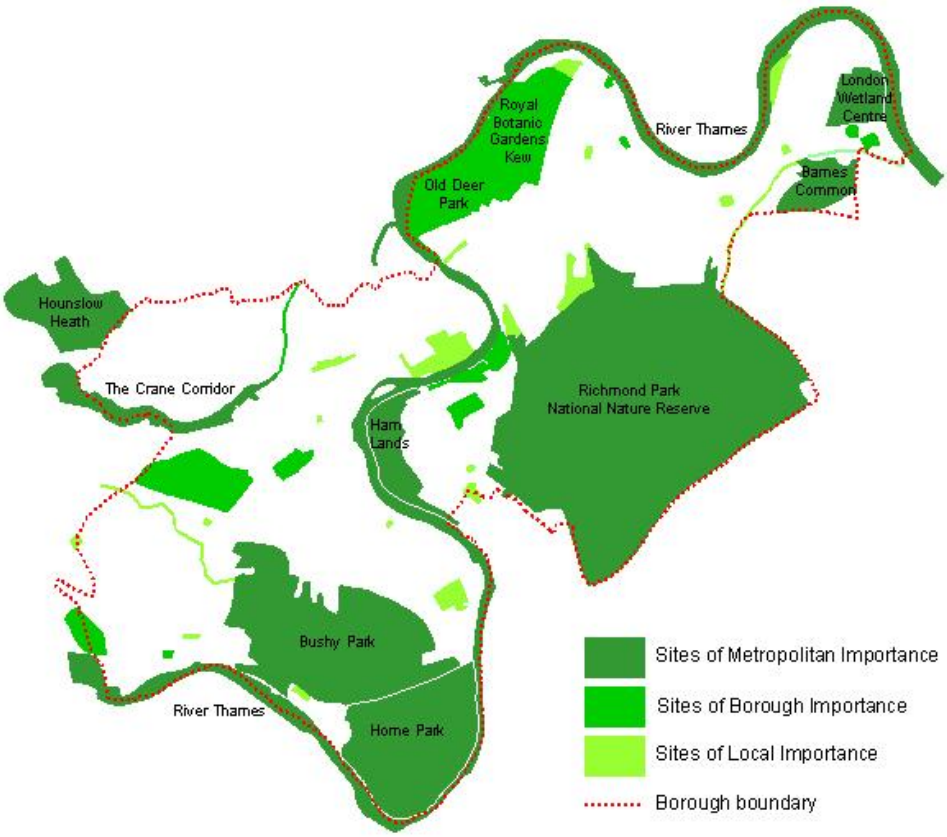
It should be noted that there has been a long established commitment and dedication to nature conservation and wildlife in Richmond upon Thames through the determination and efforts of various landowners, including the Local Authority, as well as organisations, community groups, volunteers and local residents.

The main aims of the Richmond Local Biodiversity Action Plan are:

- **To conserve, and where possible, enhance Richmond's variety of habitats and species, in particular those, which are of international or national importance, are in decline locally, are characteristic to Richmond or have particular public appeal, which can raise the profile of biodiversity.**
- **To ensure that Richmond residents become aware of, and are given the opportunity to become involved in, conserving and enhancing the biodiversity around them.**
- **To raise awareness and increase stakeholder involvement in maintaining and where possible, enhancing species and habitats of importance.**

3. Wildlife within Richmond upon Thames

3.1. Sites of Metropolitan, Borough and Local Importance for Nature Conservation in the London Borough of Richmond upon Thames



Adapted from the Ecology Handbook – No. 21 Nature Conservation in Richmond upon Thames

The London Borough of Richmond upon Thames covers approximately 5,500 hectares and it is the only London Borough to straddle both sides of the River Thames. Richmond upon Thames is believed to be one of the richest boroughs in London in terms of the total area of green space, the quality and diversity of parks, open spaces and conservation areas and the wealth of different habitats and species these areas support, as many of the species are also important on a regional, national and international scale.

There are many landowners within the London Borough of Richmond upon Thames including Richmond Borough Council. All of the landowners recognise the importance of this borough in terms of its green spaces, as we are fortunate to have two Royal Parks; Richmond and Bushy Parks, Home Park and Hampton Court Palace, London Wetland Centre and Royal Botanic Gardens Kew all in one borough. Nature conservation value is an intrinsic component to these areas and this is recognised by the efforts of individuals, groups and organisations to protect and enhance the habitats and species of importance.

The London Ecology Unit undertook a Phase 1 habitat survey in 1987, which initiated the production of the London Ecology Unit's "Ecology Handbook – No. 21 Nature Conservation in Richmond upon Thames". A number of other surveys have been undertaken since then, but all the surveys have highlighted that Richmond is ecologically important for an array of habitats including woodland, grassland, scrub and wetland, which have been broadly described below.

3.1.1. Woodland

There are many important areas of broad-leaved woodland within Richmond Borough, but most of them are secondary woodlands that have naturally regenerated and succeeded from heathland or acid grassland areas after grazing ceased, such as on Barnes, East Sheen and Ham Commons. There is no ancient woodland within the borough, although there are many magnificent ancient trees in Richmond Park and The Copse in Ham. There are several trees with limbs broken off from storm damage, which have numerous natural cavities that provide ideal nesting sites for woodpeckers, nuthatches, treecreepers, owls and bats, which all feed on the tremendous numbers and diversity of invertebrates which are supported by these trees.

Ancient trees, standing deadwood and fallen timber contribute to one of our most important habitats for biodiversity, especially in Richmond Park, where over 200 rare species of beetle can be found. The Park is the third best site in Britain for decaying wood invertebrates, including the stag beetle.

3.1.2. Grassland

Whilst there are large areas of open grassland in Richmond, many of these sites are not managed primarily for nature conservation. These include sports pitches: cricket, football and bowling greens, and recreational areas such as playing fields. The areas that are typically managed as meadows support the largest amount of flora and fauna, but the soil type and management practices of a site will ultimately affect the species composition.

A lot of Richmond's grasslands are acidic and the largest areas are contained within Richmond Park, Bushy Park and Home Park (Hampton Court). Other important acid grassland sites are the commons of Barnes, East Sheen and Ham. These sites contain many important plants, but the plant mostly associated with acidic conditions is heather, but unfortunately like most of London, only small remnants now remain within the borough, although efforts are being made on Barnes Common to restore an area of heather.

3.1.3. Scrub

Scrub usually occurs as a transitional stage in the succession from grassland to woodland, notably where grassland has been left unmanaged. However it is an important habitat for an array of species, predominantly birds, as it provides ideal cover for nesting, feeding and breeding. There are some important sites within the borough that contain scrub, and these tend to be the Commons where grazing has ceased and succession has progressed, such as on Barnes Common where there is gorse and broom. However one of the most important is Ham Lands Local Nature Reserve, which is noteworthy for the number of song thrush territories.

3.1.4. Wetland

There are many important wetland (flowing and standing water) areas within the borough. The most important and well known is the River Thames, of which there are tidal and non-tidal sections in the borough. Other watercourses include the River Crane, Duke of Northumberland River, Longford River and Beverley Brook, which support an array of flora and fauna such as the water vole. These wetland areas provide ideal habitats for many species, for example Leg O'Mutton reservoir and London Wetland Centre are havens for waterfowl and Stain Hill reservoir is the only known site in London that supports the nationally scarce tower mustard *(Arabis glabra)*.

3.2 Conservation Areas within London Borough of Richmond–upon-Thames

There are many important areas of land in Richmond Borough that have both statutory and non-statutory designations. The table below lists all the sites within the London Borough of Richmond-

upon-Thames, which have been designated with a conservation status:

World Heritage Site	National Nature Reserves/ Special Area of Conservation	Sites of Special Scientific Interest	Local Nature Reserves	Sites of Metropolitan Importance to Nature Conservation	Sites of Borough Importance to Nature Conservation	Sites of Local Importance to Nature Conservation
RBG Kew	Richmond Park	Richmond Park	Barnes Common	Ham Lands	Barn Elms Playing Fields	Barnes Green Pond
		WWT London Wetland Centre	Crane Park Island	Barnes Common	Beverley Brook (from Richmond Park to River Thames)	The Copse: Hampton Wick/Normansfield Hospital
			Ham Common	Hounslow Heath (1 Ha in Richmond)	Leg O'Mutton Reservoir	Pesthouse Common
			Ham Lands	East Sheen Common	Duke of Northumberland River	Oak Avenue
			Leg O'Mutton Reservoir	Richmond Park & areas	Fulwell & Twickenham Golf Courses	St. Mary with St. Alban Churchyard
			Oak Avenue	The Crane Corridor	Hydes Field	Kew Pond & Kew Green
				Petersham Common	Kew Meadows Path	Marble Hill Park & Orleans House Gardens
				River Thames & Islands	Longford River	Mortlake Cemetery
				Bushy Park	The Copse, Holly Hedge Field & Ham Avenues	Ham Pond
				Stain Hill Reservoir	Occupation Lane Kew Railway Bridge	Pensford Fields
				Palewell Common	Old Deer Park	East Sheen & Richmond Cemeteries
				WWT London Wetland Centre	Petersham Lodge Woods	Hampton Hill Churchyard
				Sudbrook Park Golf Course	Petersham Meadows	Terrace Field & Terrace Gardens
				Home Park	Royal Botanic Gardens Kew	Twickenham Junction Rough
				Ham Common	Strawberry Hill Golf Course	Twickenham Road Meadow
				Sunnyside Reservoir	Hill House Filter Beds	The Cassel Hospital
					Hampton Water Treatment Works	Hampton Court House Grounds
					Hatherop Burning Ground	St. James Churchyard
						Ormand Bank

The Ecology Handbook describes 42 areas of land and grades them as:

Sites of Metropolitan Importance to Nature Conservation
There are 16 sites within the borough, which contain the best examples of London's habitats, sites with rare species, rare assemblages of species, or which are of particular significance within large areas of otherwise built-up London. These areas afford the highest priority for protection.

Sites of Borough Importance to Nature Conservation – Grade 1
Sites of Borough Importance to Nature Conservation – Grade 2
There are 18 sites that are important on a borough perspective and any damage to these sites would mean a significant loss to Richmond upon Thames. Borough sites are divided into two grades based on their quality, but hold equally the same value in terms of importance on a Borough-wide perspective.

Sites of Local Importance to Nature Conservation
There are 22 sites within the borough that are of particular value to nearby residents or schools and are local sites that are particularly important in areas where there may be a deficiency in wildlife sites.

3.3. Selection of Priority Habitats and Species

An LBAP contains Action Plans for particular priority habitats (HAPs) and species (SAPs) within the local area. This is the most important part of the LBAP and the part, which requires the most 'input' from the Partnership. The following section details which habitats and species have been selected for Richmond.

This list will be used to write Action Plans for each of the identified habitats and species, but they cannot all be written and focused on at the same time, so the Plans will be written in rounds, so that as Plans are being implemented and reviewed, new ones can be written.

Habitats	Species	Species
Ancient parkland/veteran trees	Water vole	Bumble bee
Meadow	Great crested newt	Black poplar
Acid Grassland	Stag beetle	Badgers
Broad-leaved Woodland	Skylark	Reed warbler
Urban (gardens, allotments, churchyards & cemeteries)	Song thrush	Small copper butterfly
Reedbeds	Bats	Kingfisher
Rivers and Streams	Bluebell	Dragonflies
Tidal Thames	Tower mustard	Pochard
Standing Open Water	Common frog/Common toad	Grey heron
Floodplain grazing marsh	Tawny owl	Great crested grebe
Hedgerows	Hedgehog	Cardinal click beetle
Purple moor grass/rush pasture	Woodpeckers	Mistletoe
Urban Wastelands	Knapweed	

The list is not definitive and is open to change and regular review. The first round of Action Plans has involved a wide range of individuals and organisations, and it is hoped that the list of those involved in the Partnership will grow as the Action Plans begin to be implemented.

It is important to note here the inclusion of habitats that are not traditionally associated with wildlife sites, such as urban habitats, which includes private gardens, allotments, churchyards and cemeteries. It is essential that these urban 'land-uses' are included as priority habitats as they play a vital role in:

- Supporting an amazing diversity of wildlife, for example, the national priority species the song thrush and stag beetle.
- Covering 20% of London's land area.
- Providing an important resource for involving the public in the LBAP process, for example, the Richmond Wildlife Garden Surveys have proved to be a popular way of involving local residents.

3.4. Habitats

Richmond is exceptionally lucky in supporting a wealth of different habitats, several of which are important on an international scale. Safeguarding and enhancing habitats is the key to conserving biodiversity. A good quality habitat can support a far richer range of species than a poor quality/mismanaged one. One of the main aims of the Local Biodiversity Action Plan (LBAP) is to halt further habitat loss, to enhance the quality of what is left through improved management and, where possible, increase the habitat resource through creation and/or restoration.

The list of habitats and species is not exhaustive, but the Richmond Biodiversity Action Plan aims to concentrate and prioritise on those that are rare, in decline, characteristic of Richmond or considered locally important, in order to help raise the profile of biodiversity as well as conserve, protect and enhance those habitats and species of value.

The LBAP also recognises the close relationship between habitat quality and species survival. This is particularly important with regard to wildlife corridors and 'stepping stones', which provide invaluable habitat access to mobile species in an urban environment.

The UK Steering Group Report provides a list of 38 key (14 priority, 24 conservation concern) habitats for which conservation action is required. It also recommends that species and habitat priorities be set in a local context, a key factor in the production of a LBAP. Recommended criteria to select priority habitats include:

- UK priority habitats selected by the UK Steering Group Report, particularly those characteristic of London and the local area.
- Those, which are facing local decline.
- Those, which can be considered a 'flagship' habitat i.e. they appeal to the public and are, therefore useful publicity tools.
- Those, which have significance in a national and regional context.
- Those that support key priority species.
- Those, which have potential for enhancement.

Using these criteria, the following habitats are of particular priority in the London Borough of Richmond upon Thames and have been focused on in the first round of Action Plans.

Habitat	UK/London Priority habitat present in Richmond	Local decline	Flagship	Local significance	Support key species	Potential for local enhancement
Acid Grassland	✓	✓		✓	✓	✓
Ancient Parkland and Veteran Trees	✓		✓	✓	✓	
Broad-leaved Woodland	✓			✓	✓	✓
Reedbeds	✓				✓	✓
Tidal Thames	✓	✓	✓ (River Thames Corridor)	✓	✓	✓

It should also be noted that Habitat Action Plans can be used to publicise 'flagship' species, which provide a useful vehicle for encouraging the public's interest in biodiversity.

3.5. Species

The protection and appropriate management of a habitat should generally ensure the survival of individual species associated with that particular habitat. However, some species have reached such critically low levels in their population numbers that they require specific attention. Conservation action to conserve priority habitats and species will also have beneficial effects on other species, which although not considered of priority now, may well become so in the future without appropriate management.

The UK Steering Group Report listed 1250 species, which require conservation action. This list is sub-divided into two sections, those that are considered 'priority species', and those that are of 'conservation concern'. Obviously an area as diverse as Richmond supports a huge number of species from both lists. Guidelines for selection have been produced by the UK Steering Group, which are as follows:

- All priority species. Conservation action at the local level will contribute to national species targets.
- Those facing local decline.
- Those that can be used to raise the profile of biodiversity in the public eye.
- Those that are characteristic of the Borough.
- Those that serve as good indicators of habitat quality.

Using the above criteria the following species have been identified as being of particular priority in the London Borough of Richmond upon Thames and have been focused on in the first round of Action Plans.

Species	UK species of 'priority' or 'conservation concern' found in Richmond	Local decline	Profile raiser	Characteristic of the Borough	Good indicator species of a particular habitat*
Bats	✓			✓	
Mistletoe	✓			✓	
Song thrush	✓	✓			✓ Scrubland Private Gardens
Stag beetle	✓	✓		✓	✓ Decaying wood
Tower mustard	✓			✓	
Water vole	✓	✓	✓	✓	

* An indicator species is a species whose presence/absence or decline/increase provides an insight into the quality of the habitat with which it is associated. Obviously there are no indicators, which can tell us everything. However, a well chosen one can give even the most casual observer a good overview of the habitat in question.

4. Monitoring, Reporting & Review

The monitoring, reporting and review process is key to the success of Richmond's Biodiversity Action Plan. Monitoring is an important feature within the process, as it will help identify whether targets detailed within the individual Species and Habitat Action Plans have been met and if not, to identify solutions as to why these targets have not been met, so that such revisions can be made to the Biodiversity Action Plan.

It is not meant to be a static document, rather a constantly evolving process, to meet the requirements on a local level and to also ensure proactive conservation continues on the ground to protect and enhance Richmond's priority habitats and species.

The first edition of Richmond's Biodiversity Action Plan will run for a 5-year period, but will be reviewed every year, to take into account new information about a particular resource, whether the timing of individual actions need to be refined, whether new action plans are required as well as taking into account changes in local conditions. The annual review will also highlight all the progress and action that has been undertaken in the borough as well as highlight the priorities for action for the forthcoming year.

4.1 The Role of Leads and Other Partners

It has been identified that for each Action plan to be a success, a Lead is required, whose contact details can be found at the end of all the plans. The lead's role is to co-ordinate the work and actions of all the partners that are listed to ensure that implementation is recorded and monitored. This information will be used to produce an annual report. In addition, each action under the objectives and targets within the Habitats and Species Action Plans has a lead partner. The role of these partners is similar to the Action Plan Leads - and it should be pointed out that the lead will not necessarily be solely responsible for undertaking the action by themselves. The 'other partners' identified in the actions are some of the implementers, but there will be many organisations not involved in the process of putting the plans together that are needed on board, and are both welcome and encouraged to get involved.

Organisations identified as the lead or other partners that are listed next to actions are only there if they have agreed to be. Therefore, the Action Plans are not a wish list of people who should be involved, but are aware, as this process enables organisations to integrate the relevant actions into their own work programmes.

4.2 The Role of Action Plan Working Groups

Most of the Action Plans have recognised the need to set up or have a working group specific to that habitat or species. Working groups have proved to be an excellent medium for lead partners to co-ordinate implementation, identify new threats and opportunities for their plans and to draw in new members with the required expertise. Drawing in new members can sometimes be a difficult task, but the Chair of Richmond Biodiversity Group can help achieve this, by various forms of publicity such as writing press releases and through the quarterly Richmond Biodiversity Group Newsletter.

The initial composition of the working groups may be indicated in the plans, but further members are always needed and interested organisations are welcome and encouraged to contact the Lead Partner to get involved with the relevant Habitat or Species Action Plan.

4.3 Monitoring

The MARS (Monitoring and Recording of Species) group of Richmond's Biodiversity Partnership will play a vital part in the monitoring process. Recording of species will indicate the success of

whether targets detailed within the individual Species and Habitat Action Plans have been met, and if not to identify solutions as to why these targets have not been met, so that such revisions can be made to the LBAP.

Any interested individual, group or organisation who would like to get involved in monitoring species should either get in touch with the Lead of the relevant Species Action Plan or the Chair of Richmond Biodiversity Group.

Monitoring of habitats and species will indicate whether the aim to reverse the decline of priority habitats and species within the borough has been achieved. This will help review, update, as well as add or delete any Habitat or Species Action Plans within the Biodiversity Action Plan.

4.4 Reporting and Review

The leads for each Habitat or Species Action Plan will monitor and record the progress of actions by specifying what has been achieved throughout the year. The leads will report progress to the Richmond Biodiversity Steering Group at quarterly meetings. The leads will also report successes; failures and actions achieved as well as plans for the forthcoming year by producing summary reports on an annual basis. This information will then be collated annually by the Chair of Richmond Biodiversity Group, and reported to all the partners and the public every year in a Richmond Biodiversity Action Plan Annual Report.

Analysis and evaluation of the nature conservation resource is clearly a major component of the LBAP. Any collated information will require storing in a database either at the local borough level or at Greenspace Information for Greater London (GIGL), which is London's Records Centre that collates and manages all data for London's green (and brown) space.

4.5 Biodiversity Action Reporting System (BARS)

Biodiversity Action Reporting System is a national BAP-reporting database, which was launched in 2004. It is an information system that supports the planning, monitoring and reporting requirements of national, regional, local and company Biodiversity Action Plans. BARS will hold information on all UK national, regional and local partnership actions and progress, so it allows users to learn about the progress being made with local and national BAPs.

It will be useful to the Richmond Biodiversity Partnership in producing progress reports, and measuring our contribution to the delivery of relevant regional and national Biodiversity Action Plans.
The system will enable everyone involved in Richmond's BAP to enter what actions have been achieved for each of the Habitats and Species Action Plans, and record progress towards the targets. Members of the public can also access the site to see what BAP activities are underway, which will also help raise awareness and increase public involvement in the BAP process.

5. Contacts

- Bushy Park: 020 8979 1586
- Hampton Court Palace and Home Park: 0870 752 7777
- London Borough of Richmond-upon-Thames - Ecology Section: 020 8831 6125
- London Wildlife Trust (Richmond Group): 020 8948 7242
- Richmond BTCV: 020 8831 6150
- Richmond Environmental Information Centre: 020 8891 2930
- Richmond Environment Network: 020 8831 6150
- Richmond Park: 020 8948 3209
- Royal Botanic Gardens Kew: 020 8332 5655
- Wildfowl and Wetlands Trust London Wetland Centre: 020 8409 4400

6. Abbreviations

BAP – Biodiversity Action Plan
DEFRA – Department for Food and Rural Affairs
GIGL – Greenspace Information for Greater London
GLA – Greater London Authority
LA21 – Local Agenda 21
LBAP – Local Biodiversity Action Plan
LBBF – London Boroughs Biodiversity Forum
LBP – London Biodiversity Partnership
LEU – London Ecology Unit
MARS – Monitoring and Recording of Species
NGO – Non-Governmental Organisation
SINC – Site of Importance to Nature Conservation

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UK BAP website: www.ukbap.org.uk

UK BAP BARS website: www.ukbap-reporting.org.uk

HABITAT ACTION PLANS

- **Acid Grassland**
- **Ancient Parkland & Veteran trees**
- **Broad-leaved Woodland**
- **Reedbeds**
- **Tidal Thames**

Richmond upon Thames
Habitat Action Plan
Acid Grassland

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"By the middle of spring there may be on the … Common little heaps of sandy material surrounding a miniature crater which leads to a deep hole, like the pipe of a toy volcano… shortly a red-tailed bee approaches, goes down the shaft, performs its business, and departs."

(Walter Johnson, *Animal Life in London*, 1930)

1. Aims

- To ensure the protection and optimal management of acid grassland and its associated wildlife within the London Borough of Richmond upon Thames.
- To improve on existing local knowledge of its ecological value in the local and regional context.
- To develop local appreciation of the habitat and its wildlife, and secure the involvement of local residents in its conservation.
- To establish and implement an appropriate management system for all significant sites of acid grassland found within LB Richmond.

2. Introduction

Acid grassland refers to the types of sward that develop over acidic soils, which are usually derived from underlying sands and gravels, are free-draining and low in nutrients. The habitat generally consists of various fine-leaved grasses and associated wildflowers, such as common bent, red and sheep's fescues, wavy hair-grass, sheep's sorrel, tormentil, cat's-ear and heath bedstraw. Also included here is a less widespread type consisting mainly of purple moor-grass which is found where drainage is more impeded and is present in Richmond Park.

Significantly, these soil conditions also support dwarf-shrub heathland, and much of today's acid grassland represents a degraded habitat, which has lost its characteristic low-growing shrubs (such as heather), due to various erosive forces. It is important to remember, however, that acid grassland has always had an important place in the habitat mosaic on heathlands, and the present lack of heather must be seen as symptomatic of an imbalance brought on by particular circumstances rather than the undesirable replacement of one habitat by another.

The term *acid grassland* may mean little to most people but there is no reason why the finer qualities of the habitat should not gain wider appreciation. The typical fine grass species associated with this habitat (for example wavy hairgrass *Deschampsia flexuosa,* fescues *Festuca*

spp and common bent *Agrostis capillaris)* are attractive in themselves and do not require regular mowing. Unlike chalk grassland, acid swards are not generally celebrated for their wealth of colourful wildflowers, although they can present a colourful mosaic containing low-growing species such as sheep's sorrel *Rumex acetosella*, and some of the characteristic species are highly attractive. These include harebell *Campanula rotundifolia*, common stork's-bill *Erodium cicutarium*, buck's-horn plantain *Plantago coronopus*, heath milkwort *Polygala serpyllifolia*, sand spurrey *Spergularia rubra* and bird's-foot *Ornithopus perpusillus*. Nationally scarce plants found in Richmond's acid grassland include clustered clover *Trifolium glomeratum,* upright chickweed *Moenchia erecta*, bur medick *Medicago minima and* autumn squill *Scilla autumnalis*.

The acid grasslands of LB Richmond form a large proportion of those of Greater London which, with south Essex and north-west Kent, appear to be the natural home of a distinctive group of insects and spiders known collectively as the Thames Terrace Invertebrates. Features believed responsible for this include the loose and often denuded substrate, the availability of nectar-rich wildflowers, plus the region's geographic situation in the driest corner of the British Isles yet still close to the sea. Prominent within the group are many hole-nesting bees, ants and wasps, such as the rare mining bee *Andrena florea*. The UK distribution of many of these species is apparently very restricted and is under pressure from continuing development and lack of appreciation for the acid grassland habitat on which they depend.

More familiar insects frequenting acid swards are the small heath and small copper butterflies, while the ant-hills of yellow meadow ants are another common feature. Associated bird life, attracted by rich insect pickings, includes the meadow pipit, skylark and green woodpecker.

The largest areas of acid grassland in LB Richmond occur in and around Richmond and Bushy Parks, with other areas in Hampton Court Palace / Home Park, Kew Gardens and the Commons of Barnes, East Sheen and Ham. Most of these sites lie on the gravels of the River Thames terraces, giving rise to free-draining, light soils.

3. Current Status

Lowland dry acid grassland is listed as a priority habitat for conservation in the UK Biodiversity Action Plan. London's estimated 1300 hectares contribute about 4% to the national resource. Because of the widespread distribution of acidic soils most boroughs have some acid grassland – in fact only six do not. Although there are several extensive areas, for example in Richmond Park, on Wimbledon Common and Putney Heath in Merton and Wandsworth, and at Wanstead Flats in Redbridge, a significant proportion occurs as widely scattered, overlooked fragments on the margins of more ubiquitous habitats, such as amenity grassland, scrub, road and rail verges and on some longer-established wasteland sites.

Much of London's remaining acid grassland has suffered in quality through a variety of factors. Ideally, it would be maintained by grazing animals and occur alongside stands of heather and gorse, small areas of bare ground and lichen cover, patches of scrub and peat-filled bogs. There would also be variation in structure within the grassland community reflecting its stage of succession. However, over-intensity of use or management neglect, with consequent invasion by coarse grasses, bracken and developing woodland, are all too commonly associated with the habitat London-wide.

LB Richmond has the largest total area of acid grassland in Greater London with 620 hectares. *[Please note that figures for areas of Acid Grassland vary according to the detail of the survey, and whether the area recorded is one which is 'purely' acid grass covered, or includes other species and even neutral grasses but is predominantly acid grassland.]* This accounts for almost half of this habitat in greater London (46%), and therefore any significant changes to the area within LB Richmond are also significant within London. In view of its scarcity within London, it is not surprising that many of its characteristic species are also rare. Most of the acid grassland specialist species can be found within LB Richmond.

An ecological survey was undertaken in 1984/5 by the then London Ecology Unit, and various other surveys have been conducted since then. However, these surveys do not of themselves provide a satisfactory baseline for accurate measurement of the loss or gain in total acid grassland

coverage within LB Richmond over the years. Anecdotal evidence suggests that there has been a significant increase in the acid grassland at Kew Gardens due to a more relaxed management system. However, in some other areas, such as on Barnes Common and Ham Common, there may have been significant losses in the past two decades, since grazing ceased well before that. This has resulted in encroachment of woodland, scrub, bracken and bramble, although in recent years more active management at these sites may have arrested this decline or even have reversed it.

4. Specific Factors Affecting the Habitat

4.1 Lack of a clear identity

Because of acid grassland's somewhat lowly image and confusing identity as a habitat type, it is often undervalued. This makes it particularly vulnerable to mismanagement and frequently seen as expendable by developers and their advisers.

4.2 Management Constraints

4.2.1. Losses seen within the past decade to the acid grasslands at areas such as Barnes Common and Ham Common are a disturbing indication of what might be to come. The optimal management of acid grassland is through low intensity natural grazing by deer, rabbits and/or carefully managed grazing by other animals – as is evidenced by the successful management in the Royal Parks, although even in these well-managed areas further improvements are possible. However, the small size, fragmented nature and concern about any fencing of common lands make this impractical for open areas such as Barnes, East Sheen and Ham Commons. Even where grazing is possible, there is concern about the disturbance to wildlife and grazing animals from uncontrolled dogs and the presence of too many visitors to an area.

4.2.2. Mowing is the most suitable option for ungrazable open spaces, but this is expensive and contractors are not necessarily available at the right times, with the right equipment and expertise, to undertake the work in the most environmentally suitable way. Many areas are inaccessible or unsuitable for tractor mowing, due to obstacles such as uneven ground, ant-hills or tree stumps, and yet tractor mowing is the only economically feasible means at present. Given the importance of the grasses for insects, the method of mowing should ideally cause minimum damage to the grass. Removal of the cuttings, desirable to avoid soil enrichment, should be delayed briefly to allow insects time to safely evacuate the area after cutting and before baling or other removal. Few mowing contractors are able to offer such a service.

4.2.3. The lack of resources can lead directly to passive neglect of the habitat, allowing bracken to dominate, scrub and woodland to develop and invasive weeds to establish themselves.

4.3 Amenity use

The majority of LB Richmond's acid grassland is found in public open spaces and in golf courses where there are often heavy pressures on site managers to accommodate conflicting recreational demands. Acid grassland therefore continues to be lost through unsympathetic management, such as irrigation, reseeding and even tree planting.

The heavy pressure on these areas as public amenities for leisure and recreational uses, such as dog-walking and horse-riding, adds to the amount of litter and excreta, while thoughtless dumping of green garden waste only adds further to the increased nutrient levels which threaten this habitat.

The threat of fires, whether these might be started by accident or deliberately, is another hazard in public sites, which can require managers to keep their grasslands mown too short to benefit wildlife.

4.4 Other Concerns

4.4.1. Roads, cycle tracks and footpaths through the open spaces on which most of LB Richmond acid grasslands are found are often regarded as vital routes for through traffic, and 'best practice' management plans to address the consequent degradation have to be tempered to accommodate the wider regional transportation and local amenity concerns.

4.4.2. Nutrient enrichment by atmospheric pollution is causing increasing concern, but is beyond the control of most site managers. Vehicle emissions are an insidious agent of change within plant communities and are being partially addressed in some areas such as Richmond Park, but are beyond control in most other areas of Richmond. Salt applied to roads in winter can be damaging to vegetation on verges, while all the LB Richmond sites are below the Heathrow flight path and are exposed to enhanced pollution levels from air traffic.

4.4.3. There is constant pressure on open unprotected sites for development purposes, and even protected sites may suffer from increasingly dense development at their fringes, leading to increased fragmentation and habitat degradation.

5. Current Action

5.1 Legal status

5.1.1. Many of the areas of acid grassland within LB Richmond enjoy some level of recognition and protection: Richmond Park is both a Site of Special Scientific Interest (SSSI) and a National Nature Reserve as well as being a Grade 1 Heritage Landscape and European Special Area of Conservation. Hampton Court Palace / Home Park is a Site of Metropolitan Importance for Nature Conservation and a Grade 1 Listed Park. Kew Gardens is a World Heritage Site. Barnes Common lost its status as an SSSI due to degradation but remains Metropolitan Open Land and a Local Nature Reserve and so receives statutory protection. Bushy Park is at present a Site of Metropolitan Importance for Nature Conservation as are many of the other areas in which significant acid grasslands are to be found in the borough.

5.1.2. Specially protected species associated with the habitat in LB Richmond are primarily the rare invertebrates, several of which are listed in the British Red Data Book (RDB), for example the mining bee *Andrena florea*, the bee wolf wasp *Philanthus triangulum* and the digger wasps *Diodontus insidiosus* and *Cerceris quinquefasciata*.

5.2 Mechanisms targeting the habitat

The following management and restoration actions are ongoing. They need to be supported and continued in addition to the action listed under Section 7.

5.2.1. Scrub management: most protected sites have management plans and some have benefited from grant aid schemes, such as the Environmental Stewardship Scheme, which offer finance towards fencing and scrub clearance projects. Following these labour intensive and therefore costly operations, there are usually enough resources to keep swards open by the most convenient method, which is grazing, mowing or selective strimming.

5.2.2. Mowing regimes and stripping: grazing and/or mowing, as well as minor, controlled fires been effective in halting succession on many sites. However, it is crucial for cutting regimes to be carefully worked out, otherwise much damage can be done, especially to a site's invertebrate interest.

5.2.3. Enhancement: habitat enhancement to increase species and structural diversity can mean some creation of heathland within acid grassland and vice versa. For example, heather restoration is an aspiration for Barnes Common. Trials commenced in 2003. The aim is to convert an area of about one hectare of primarily neutral grassland to heathland with acid grasses.

Stripping of enriched soils is beneficial and the regular creation of areas of bare ground facilitates nesting for some threatened invertebrates.

6. Flagship Species

These special plants and animals are characteristic of acid grassland in LB Richmond.

Harebell	*Campanula rotundifolia*	This, the "bluebell" of Scotland, is a welcome addition to dry grassland swards late into the summer.
Sheep's sorrel	*Rumex acetosella*	A member of the dock family, its blood-red leaves particularly characterise acid grassland and have been eaten as a wild salad plant in the past.
Heath bedstraw	*Galium saxatile*	A sprawling plant, often found on the tops of anthills. In flower it has a foam-like appearance, and along with other bedstraw species was traditionally used to stuff pillows and mattresses. A chemical property may have repelled bed bugs and other parasites.
Wavy hair-grass	*Deschampsia flexuosa*	An attractive grass with a silvery-red inflorescence, it is typical of several fine grasses found in this habitat.
Small copper butterfly	*Lycaena phleas*	The metallic orange of this tiny butterfly's forewing provides its common name. A common larval foodplant is sheep's sorrel.
Green woodpecker	*Picus viridis*	Or "yaffle", is frequently seen on the ground in acid grassland. A favoured food of this striking bird is ants, and it is these that bring it out from its more usual haunts amongst parkland trees and woodland.

7. Objectives, Actions and Targets

Please note that the partners identified in the tables are those that have been invited to be involved in the process of forming the plan. It is not an exclusive list and new partners are both welcome and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: To secure appropriate management for acid grassland
Target: Appropriate management in place on all existing significant acid grassland sites by 2010

Action	Target Date	Lead	Other Partners
1.1 Establish network of acid grassland site managers and conservation bodies as an 'Acid Grassland Working Group'	2005	FOBC	TRP, LBP, HRP, LA, Golf Courses
1.2 Distribute best practice habitat management guidelines	2005	Working Group	TRP, LA
1.3 Facilitate production of suitable management plans for all significant sites with acid grass	2008	Working Group	LA, Landowners, Land Managers
1.4 Audit inclusion of Acid grassland best management practices within Management Plans	2010	Working Group	
1.5 Establish working relationships with	2007	Working	LBHounslow/CIP,

organisations in neighbouring boroughs which have relevant experience		Group	LBWandsworth, WPCC LBMerton

Objective 2: To increase knowledge of local acid grassland and its wildlife
Target: To carry out a baseline survey and establish a regular monitoring system for acid grasslands by 2008

Action	Target Date	Lead	Other Partners
2.1 Identify resources and reports available and required	2005	Working Group	Friends Gps, GLA
2.2 Arrange additional survey work as required to create Baseline Survey, using same methodology as recent ones in Richmond and Bushy Parks.	2005/6	Working Group	Friends Gps
2.3 Develop monitoring system and procedures manual	2007	Working Group	GLA, LBP
2.4 Identify possible surveyors/monitors and provide training as necessary	2007/8	Working group	Friends Gps., REN
2.5 Produce report and disseminate to all interested parties	2009	LA	Wkg. Gp., TRP, HRP

Objective 3: Raise profile of acid grassland and develop appreciation of its ecological value, encouraging greater public awareness and interest in this habitat.
Target: Promote acid grassland using identified flagships, through series of public events and communications, by 2008

Action	Target Date	Lead	Other Partners
3.1 Develop lists of walk leaders and speakers & distribute to all site managers	2006	Working Group	Friends Gps, LA, REN
3.2 Produce interpretive materials on LB Richmond's acid grassland resource, focussing on its national importance, and disseminate.	2007	LA	Wkg Gp, London HAP, Friends Groups
3.3 Produce Panel on acid grassland for display at fairs etc in LB Richmond	2007	LA	Working Gp
3.4 Encourage inclusion of materials in Friends' and other websites	2007	Working Group	Friends Gps
3.5 Continue campaign through letters to local residents, press releases etc focused on good news / positive work taking place	2008	Working group	LA, REN, Friends Gps

Objective 4: Introduce more sympathetic grassland management regimes
Target: Bring two sites into more sympathetic management by 2009

4.1 Investigate existing grazing and/or machine rings, animals, machinery available and possibilities	2006	Working Group	LA, LB Hounslow/CIP TRP, Petersham Trust
4.2 Identify and select areas where this would be advantageous	2006	Working group	LA
4.3 Develop fully costed proposal(s)	2007	Working	Site Managers /

		group	Owners
4.4 Source funding and implement	2009	Site Mgrs/ Owners	Working Gp, LA

Relevant Action Plans

Local Plans
Ancient Parkland & Veteran Trees

London Plans
Acid Grassland; Woodland; Heathland; Wasteland; Churchyard and Cemeteries; Parks, Amenity Grasslands & City Squares; Open Landscapes with Ancient/Old Trees; Rail Linesides, Reptiles; Humble bumble.

National Plans

Lowland Heathland; Lowland Dry Acid Grassland; Purple moor-grass and rush pasture; Lowland Wood Pasture and Parkland; Built environment and gardens, Skylark; Hornet robber-fly *Asilus crabroniformis*; A long-tongued bumble-bee *Bombus humilis*; Deptford pink.

Key References and Sources of Further Information

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Abbreviations

CIP – in partnership with LB Hounslow
EN – English Nature
GLA – Greater London Authority
HRP – Historic Royal Palaces
LA – Local Authority (London Borough of Richmond upon Thames)
LB – London Borough
LBP – London Biodiversity Partnership
LWT – London Wildlife Trust
REN – Richmond Environment Network
TRP – The Royal Parks
WPCC – Wimbledon & Putney Commons Conservators

Contact
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Richmond upon Thames
Habitat Action Plan
Ancient Parkland & Veteran Trees

© Nigel Reeve

"*Those grey, gnarled, low browed, knock kneed, bowed, bent, huge, strange, long armed, deformed, hunch backed, misshapen oak men that stand waiting and watching, century after century*."
(Francis Kilvert, *Diary of F. Kilvert*, 1876)

1. Aims

- To develop a strategic approach to the protection and management of the London Borough of Richmond's veteran trees.
- To promote the value of veteran trees and secure the involvement of the London Borough of Richmond's populace in their conservation.

2. Introduction

Veteran trees can be defined as 'trees, which by virtue of their great age, size or condition for that species are of exceptional value culturally, in the landscape or for wildlife.'
Veteran trees form a valuable part of our heritage, in historic, cultural and ecological terms. These attributes are now being recognised, along with their aesthetic appeal and landscape contribution.

Veteran trees can be found throughout the London Borough of Richmond –

- In areas of historical park, for example, in Richmond and Bushy Parks,
- In woodland, for example, The Copse in Ham and
- As relics of a former landscape, for example, in residential gardens in Hampton, the playing field at Barn Elms and the willows along the River Crane.

Many of them are bygones from a former time when they would have stood in much larger landscapes, harvested by pollarding (see 4.3) and revered for their economic value and religious meaning.

The 'ancient' stage of their life may be the longest, lasting for hundreds of years. It is not just the trees that are valuable but also the enormous diversity of other species that they support, for example, fungi, lichen, mosses, beetles, birds and bats. Many of these species are dependent on the dead wood habitat that is associated with veteran trees, for food and shelter. Indeed, several species of rare fungus do not appear until the tree reaches this age and condition.

3. Current Status

Data on the condition and number of veteran trees in Richmond is incomplete. The Royal Parks carried out a survey of ancient oaks in Richmond Park between 1999 and 2002 but there remains a great many trees of other species, which were not surveyed. It is known that the rest of the Borough supports a large number of veteran trees and it is recognised that a systematic approach to surveying and recording the whole resource is needed. Where individual trees have been protected by Tree Preservation Orders the details are held on a Council database.

4. Specific Factors Affecting the Habitat

The following list comprises the threats to the number and condition of veteran trees. An aim of this action plan is to raise awareness of these potential threats.

4.1 Removal of trees and dead wood

This is particularly relevant in built up areas where old trees and dead wood is removed for Health and Safety concerns. Although Health and Safety is of course of paramount concern there is often an element of over caution. A balance should be sought.
In residential areas removal of dead wood may be a consequence of 'over tidying' by gardeners.

4.2 Die-back

There are a number of theories on the cause of die back, which can be observed on trees in Richmond Park, Sheen Common and Barnes Common. Air pollution and extreme climatic conditions (drought and high water levels) are all possible causes that weaken the tree's resistance to pathogens. In Richmond European species appear less tolerant of these extremes.

4.3 Inappropriate management and neglect

Veteran trees do require care. There are many actions that can damage trees including compaction of the roots by cars and/or people. The area around the tree needs to be cared for as well as the tree itself.

Many veteran trees were previously 'pollarded' – a management technique that involves rotationally cutting branches above the browsing level. Pollarding encourages longevity through reducing crown size in proportion to root stock.

Re-introducing this ancient management technique, after centuries of non-intervention in other parts of the country has resulted in the death of some trees due to shock.

4.4 Lack of replacement trees

As veteran trees die or are lost, the lack of a younger generation of trees to replace them is producing a skewed age structure. This is leading to a loss of dead wood habitat and associated species.

To encourage a new generation of 'veterans' traditional management techniques need to be implemented on young genetic stock taken from existing veterans.

5. Current Action

5.1 Legal status

The UK Biodiversity Steering Group (1995) has produced a national habitat plan for lowland wood-pasture and parkland, but there is not a specific plan for veteran trees. Some individual ancient trees are covered by Tree Preservation Orders, for their amenity value and many veteran trees support species, such as bats and stag beetles that are protected under the Wildlife and Countryside Act 1981 (as amended by the CROW act 2000).

Regionally, the London Biodiversity Partnership has produced an audit on 'open landscapes with ancient/old trees'.

Locally, across the borough a number of veteran trees are protected by the Town and Country Planning Act (1999) for their amenity value. Trees are also taken into consideration in the

determination of planning applications. Many veteran trees receive protection because they are located within protected sites, for example, Richmond Park – a Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR) and cSAC (candidate Special Area of Conservation) and The Copse in Ham – a Site of Borough Importance for Nature Conservation.

5.2 Mechanisms Targeting the Habitat

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 7.

5.2.1 The Richmond Tree Warden Scheme

The Veteran Tree Focus group comprises representatives of the Richmond Tree Warden Scheme and is responsible for the survey of veteran trees in the borough. This survey will provide information on the number and condition of veteran trees in the borough.

5.2.2 The Royal Parks

The Royal Parks (Richmond and Bushy) support a large percentage of the veteran trees in the borough and a programme of surveys are ongoing in Richmond Park. A 30-year management plan has been written for Richmond Park, and a similar study is planned for Bushy Park

5.2.3 Local Planning Authority

The planning system affords protection for trees of amenity value.

6. Flagship Species

These special plants and animals are characteristic of veteran trees in LB Richmond.

Common Name	*Latin Name*	Brief Description
Stag beetle	*Lucanus cervus*	Larvae requires dead wood to feed in for up to 7 years before emerging as adult beetle
Bats	Various spp	Many bat species roost in cracks and crevices in mature trees
Beef steak fungus	*Fistulina hepatica*	Slowly degrades the heart wood creating ideal nesting habitats and food source
Great spotted Woodpecker	*Dendrocopos major*	A species likely to be seen on veteran trees during the day
Cardinal Click Beetle	*Ampedus cardinalis*	Develops in the rotten heartwood of old oak trees
Tawny Owl	*Strix aluco*	Nests in suitable natural cavities and holes in large trees

7. Objectives, Actions and Targets

Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: To map the distribution of all existing veteran trees in the London Borough of Richmond upon Thames

Target: To input relevant data on to a Geographical Information System (GIS) by 2008

Action	Target Date	Lead	Other Partners
1.1 Survey and map the existing population of veteran trees in the London Borough of Richmond upon Thames (ongoing)	2007	RTWS	TRP HRP
1.2 To collate and record all survey data	2008	LA	TRP
1.3 Monitor condition of veteran trees	Ongoing	RTWS	TRP HRP

Objective 2: Ensure that veteran trees are protected and enhanced with the planning process through liaison with Tree Officers/Planning Section

Target: Ensure that no veteran trees are lost to development and are protected during the development phase

Action	Target Date	Lead	Other Partners
2.1 Integrate veteran tree data within existing TPO system	2007	LA	GIGL, TRP
2.2 Prepare working brief for Tree/Planning Officers outlining importance of veteran trees.	2006	LA	TRP

Objective 3: Make provision for the replacement of existing veteran trees

Target: No significant change in veteran tree numbers by 2010

Action	Target Date	Lead	Other Partners
3.1 Establish nursery stock through growing local provenance seeds and cuttings	2008	TRP	RBGK, BTCV, LA
3.2 Identify a minimum of 5 sites for replacement and appropriate management	2007	TRP/LA	RTWS
3.3 Identify 50 young trees for implementation of traditional management	Achieved	TRP	
3.4 Publicise and celebrate ongoing traditional management techniques of young pollards	Ongoing	TRP	LA

Objective 4: Encourage sympathetic management of existing veteran trees and dead wood as a valuable wildlife habitat.

Target: Disseminate good practice guidelines by 2006

Action	Target Date	Lead	Other Partners
4.1 Send an advice note to all managers and owners of parks, woodlands, nature reserves, golf courses and formal gardens to encourage sympathetic management of veteran trees	2006	TRP	LWHWG, LA, RBG, GLA
4.2 Provide information and training to 4.3 arboriculturalists, contractors, planning and tree officers to raise awareness of the need for sympathetic management	2006	TRP	LA, LTOA
4.3 Send relevant information to developers as and when applications arrive	Ongoing	LA	LTOA, RFS
4.4 Disseminate decaying wood leaflet to all landowners, managers, golf courses, friends of groups and community groups	2006	LA	TRP, RBG

Objective 5: Generate awareness of the importance of veteran trees to all Richmond upon Thames residents

Target: Undertake a series of awareness raising activities of veteran trees in London Borough of Richmond upon Thames annually

Action	Target Date	Lead	Other Partners
5.1 Continue publicity campaign, including regular posters and press releases that include information on the needs of veteran trees.	Ongoing	LA/TRP	RTWS
5.2 Produce a simple leaflet detailing the importance of veteran trees.	2006	LA	TRP
5.3 Organise an open meeting to encourage wider involvement in the action plan	2005	LA/TRP	RTWS
5.4 Involve 5 schools in school ground surveys for veteran trees	2008	LA	RBGK
5.5 Hold a 'Ancient tree day' to celebrate the cultural, historical and ecological importance of trees	2007	TRP/LA	RBG
5.6 Produce a leaflet about the importance of managing decaying wood as a valuable habitat	2005	LA/TRP	EN, LWT

Relevant Action Plans

Local Plans

Broadleaved woodland, acid grassland, stag beetle, bats, mistletoe, songthrush

London Plans

Woodland, open landscapes with ancient/old trees, private gardens, churchyards and cemeteries

National Plans

Lowland wood pasture and parkland, stag beetle

Abbreviations

BTCV – British Trust for Conservation Volunteers
EN – English Nature
GIGL – Greenspace Information for Greater London
GLA – Greater London Authority
HRP – Historic Royal Palaces (Hampton court and Home park)
LA – Local Authority (London Borough of Richmond upon Thames)
LBP – London Biodiversity Partnership
LTOA – London Tree Officers Association
LWHWG – London Woodland HAP Working Group
LWT – London Wildlife Trust
RBG – Richmond Biodiversity Group
RBGK – Royal Botanic Gardens Kew
RFS – Royal Forestry Society
RTWS – Richmond Tree Warden Scheme
TRP – The Royal Parks

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Richmond upon Thames
Habitat Action Plan
Broad-leaved Woodland

Mixed Oak Woodland, Ham Common Woods © Oliver Whaley

Signals abound that the loss of life's diversity endangers not just the body but the spirit……The ethical imperative should therefore be, first of all, prudence. We should judge every scrap of biodiversity as priceless while we learn to use it and come to understand what it means to humanity.
(Edward O. Wilson 1992)

1. Aims

- Establish a working group to develop a strategy for the site protection and management of broadleaved woodland in the London Borough of Richmond upon Thames
- Conserve and enhance woodlands and woodland corridors, including hedgerows and scrub
- Encourage woodland research, education and promote public awareness
- Ensure biodiversity is conserved through appropriate management and species mapping

2. Introduction

The common and scientific names of trees are given in the appendix.

This Habitat Action Plan (HAP) is part of a suite of Habitat and Species Action Plans specific to the Richmond borough. It does not address directly the Ancient Parkland & Veteran Trees (see HAP) or Woodland Pasture.

Richmond is nationally important for its broadleaved woodland biodiversity. At the heart of the borough is Richmond Park that is a National Nature Reserve (NNR), Site of Special Scientific Interest (SSSI) and European Special Area of Conservation (SAC), in addition, the borough includes Bushy Park and the Royal Botanic Gardens Kew, which is a World Heritage Site.
Two important assumptions could be; firstly that broadleaved woodland biodiversity outside Richmond Park, and that within, are interdependent. Secondly, that broadleaved woodland provides a very high benefit for people and a high biodiversity at a relatively low monetary cost.

As with other areas of London, the last three decades have generally seen an increase in woodland and scrubland. Indeed Richmond is fortunate to have 396 ha (978 acres) of native woodland - the 4th highest of the London Boroughs, and 78 ha (192 acres) of non-native woodland - the 3rd highest of the London Boroughs.
Richmond woodland harbours several nationally scarce woodland invertebrates and fungi, including some UK BAP Priority species. As well as providing for biodiversity, trees perform useful

roles such as: improving air quality, as carbon sinks, generating soil, soaking up noise pollution, ameliorating hot summers and providing shade and play areas for children.
However without management such as grazing or cutting back, woodland can colonize acid grassland heaths, wild flower meadows and railway land, and can mean a gain of woodland at the loss of rare species or other habitats. Today many would consider that this loss is a fair exchange in a city for the extra services offered by trees. Equally, others would consider open spaces like heaths, should remain open and not be encroached by woodland. Clearly the answer is a trade-off that should not allow the loss of biodiversity. This means that appropriate woodland management is very important to achieve the UK BAP goals; halting or reducing the loss of biodiversity by 2010, which is subject of several key international and European agreements.

Habitat definition

Broadleaved woodland is usually defined as any woodland with more than 80% of its trees as broadleaved species. In the UK these are native species such as Ash, Hazel, Oak, Field maple, and in southern Britain; Beech and Small-leaved lime (the first four are common in Richmond and last two far less so).
Important to the active or conservative management of broadleaved woodland is the understanding of native and non-native trees. A generally accepted definition of Native Trees (*see full list in appendix*) are trees that colonized the British Isles after the last ice age before Britain was isolated from the rest of Europe by rising sea levels. Non-native trees (see Appendix) on the other hand, have been introduced recently, and for which native wildlife is not so adapted, and therefore generally have a lower biodiversity.
However Sycamore (*Acer pseudoplatanus*), that is common in Richmond was thought to have been introduced in the 15th century to Britain and serves as host to many native species, whereas native Holly; also common in Richmond, serves as host to few organisms. Both species play little known roles in woodland ecology.
In Britain the term Ancient woodland, is defined as woodland at least 400 years old and possibly since the last ice age (about 11,000 BP). As such, this woodland usually has a considerably higher biodiversity than more recent woodland, and serves to emphasize that woodland cannot be recreated simply by planting trees and that successional ecological stability takes hundreds of years.
The London Ecology Unit considered that no Ancient woodland survives in Richmond, but wood pasture and some wet woodland have demonstrable ancient credentials. Also Richmond Park contains 400 veteran Oaks that predate the enclosure of the Park about 350 years ago.

Woodland Habitats need to be linked up

Many small woodland habitats have been lost to urban development even in recent years. These 'micro-sites' perform important roles for movement of species between the other larger woodland sites. When considering appropriate measures for conservation of biodiversity, it is important to appreciate that habitats do not exist in isolation and that the more 'green corridors' linking different habitats, the more successful conservation of biodiversity will be. The scientific understanding of the interrelationships of habitats and species is still very poor. Precautionary management considerations might include regard to; seed dispersal and germination mechanisms, migration routes, disease transmission, road noise and climate change.
Therefore the proximity and interaction of habitats and biodiversity adjacent to the borough must also be considered. In Richmond these include: the SSSI of woodland / tidal flood meadow of Syon House and the wooded LNR of Isleworth Ait (both in LB Hounslow). These are separated by the River Thames from the Old Deer Park and RBG Kew. Also important are the locations and biodiversity of Wimbledon Common, Hounslow Heath and the wildlife corridor and sites of Metropolitan importance such as the River Thames and tributaries.

Broadleaved Woodland Structural Diversity

Richmond is fortunate to have a wide range of woodland habitats. The high structural diversity of new Oak forest (colonizing heath at Ham and East Sheen) and wet willow woodland (riparian Thames and river Islands), is explained to some extent by the smaller leaved species facilitating good light penetration. Whereas the closed canopy of large leaved sycamore or horse chestnut woodland, for example, found on some islands and railway embankments, in the summer excludes much of the light. This may not benefit the ground flora, but serves as an important habitat for many invertebrates, including the millipede (*Cylindroiulus londinensis*) and the brown wood ant (*Lasius brunneus*) on Eel Pie Island, and for rare snails like the Two lipped door snail (*Lacinaria biplicata*) in several riparian sycamore woodland localities.
Woodland with good structural diversity is one that contains herb, canopy and subcanopy vegetation layers of different heights and ages. Woods with gaps in the canopy - that allow sunlight to reach the ground, probably support a much greater range of plants and animals than a closed canopy with trees of different height and shade. Sunny sheltered rides, glades and clearings provide for biodiversity and people. Features such as ponds or tidal flooding within woods also increase the number of species present.
In the past, natural events such as storms, disease and fire, together with the activities of animals like beavers, created open spaces within woodland, while grazing and browsing by deer and wild cattle delayed the succession of trees and shrubs and kept the gaps open. Early woodland management systems by man, such as coppicing, created and mimicked conditions for many species over centuries. But the widespread cessation of such management activities in the 20th century has led to the decline and loss of a number of species that require diverse structure and more open conditions.

3. Current Status

3.1 Overview

The London Borough of Richmond upon Thames is about 11 % wooded, which is about 474 hectares and more than any other neighbouring borough.
The majority of woodland is found in the Royal Parks, Petersham Common, Ham Common, East Sheen Common, Royal Botanic Gardens Kew, The Old Deer Park, Barnes and Ham Commons and along the Thames and its islands, as well as on railway land. *

Within the borough, as with other areas of London, broadleaved woodland is on the increase. Either it has been allowed to regenerate, or as in the case of Sheen and Ham Common is in the process of a natural transition from heath to woodland. Several factors in the last 100 years have meant that the deflected succession, formerly carried out by grazing animals, like rabbits or horses or other management, has drastically declined.
The borough broadleaved woodlands are very varied in composition partly due to the fact that most are between 40 - 200 yrs old and therefore are in many stages of regeneration.
In areas of woodland colonization like Petersham, Ham and Sheen Common a thriving mosaic of succession is found; with slopes, old drainage ditches and soil types contributing well to the habitat heterogeneity. In other areas, such as the parts of Ham lands and several islands, Sycamore dominates, often with unusual non-native trees such as Swamp cypress and Chinese necklace poplar. Sycamore is considered as invasive, but without further research and given the ‘natural’ thinning mechanisms (such as sooty bark disease), provides perhaps an equally valuable contrasting habitat, albeit perhaps less aesthetic.
Particularly unusual habitats are the tidally flooded Willow woodlands. The riparian wet woodland fragments are characterized by many Willow species including natural hybrids, and often include Elder and Hawthorn. In the past, native Black popular and Alder would have been more prevalent along the river, and found in stands, rather than today, where they are found as isolated individuals.

* Railway land woodland and scrub are currently mostly unrecorded

3.2 Specific woodland habitats in London Borough of Richmond upon Thames

The key examples are as follows:

(i) Old Deer Park Flood Canal Wet Woodland

Mixed wet woodland and tidally flooded Willow carr

Characterized by: Many Willow species, Hawthorn, Elm, Reedbeds (*Phragmites australis*) Sedges (*Carex* sp.), Cut grass (*Leersia oryzoides*) (Schedule 8 Countryside and Wildlife act 1981), including other taxa e.g. two lipped Door Snail (*Lacinaria biplicata*), Violet ground beetle (*Carabus violaceus*).

(ii) Ham Common / East Sheen Common

Mixed Oak woodland colonised heath

Characterized by: Oak, Honeysuckle, Holly, Dogwood, Aspen, Sallow (in depressions with Yellow loosestrife (*Lysimachia vulgaris*). With heath relics including: Gorse, Wavy-hair grass (*Deschampsia caespitosa*) and Birch (a pioneer species now dying back).

(iii) Petersham and Ham Sea Scouts Tidal Willow Wood

Tidally flooded Willow woodland,

Characterized by: Strandline detritus rich in invertebrates, Crack Willow, Pendulous sedge (*Carex pendula*), Hemlock water dropwort (*Oenanthe crocata*) 3 Cornered leek (*Allium triquetrum*), inscrutable small leaved Elm species and 3 huge London planes, with bat roosts.

(iv) Thames towpath and Island Woods

Riparian and Island tidally flooded Woods

Characterized by: Sycamore, Willow, Poplar (including Native Black Poplar) with strandline detritus rich in invertebrates, Pendulous sedge (*Carex pendula*), Hemlock water dropwort (*Oenanthe crocata*), Himalayan balsam (*Impatiens glandulifera*) and Nesting Heron (*Ardea cinerea*)

(v) Petersham Common Woods

Mixed escarpment Ash / Oak / Hornbeam woodland

Characterized by: Tall Ash, Oak (*Quercus* spp.) and Hornbeam with subcanopy Field maple, Bird Cherry, Norway maple, Dewberry – (*Rubus caesius*)

Other types include: Wood pasture; Sycamore; Willow / Poplar; Oak / Birch; Blackthorn / Hawthorn scrub, Elm thickets.

4. Specific Factors Affecting the Habitat

4.1 Habitat destruction and fragmentation through urban development

The largest cause of habitat loss is urban development. Fragmentation of habitat is a fundamental factor contributing to the loss of biodiversity, in that genetic exchange, and therefore species survival, is threatened. It also prevents necessary species migration due to such things as resource depletion, population displacement, breeding or climate change.

4.2 Unsuitable or lack of management

Contractors and volunteers should have felling licenses that are assessed against the requirements of the UK Forestry Standard (1998), which takes into account biodiversity considerations. Good Management should be appropriate in type, timing and extent. Bad and illegal practice includes, for example, chainsaw use in the bird breeding season or removal of

hollow trunks that are usually bat roosts. If tree branches have to be removed they should be surveyed for bats. Often a naturally collapsing tree is the best self management within woodland.

4.3 Loss of genetic integrity through replanting with stock of non-local provenance.

Genetic research has allowed us to see that local stock are likely to be better adapted to local conditions, and therefore have a better chance of long-term survival. Imported stocks of native species may well introduce genetic erosion, weaknesses and bring in disease.

4.4 Climate change.

After habitat loss, the effects of anthropogenic Climate change are possibly the biggest threat to Richmond woodland biodiversity over the next 100 years, although the extent and precise effects on wildlife are difficult to predict, and we do not know the tolerance of many species.
Research is beginning to suggest that root mycorrhiza (fungal symbionts) that are adapted to the more stable subsoil conditions, are not tolerant of climate change effects like drought or lack of frost. Beech trees are very sensitive the effects of prolonged dry summers on native woodlands.

Research is beginning to show that woodlands dynamics and other subtle mechanisms are changing. For example it has been shown that competitive species such as holly are growing more extensively and rapidly, as subcanopy species, due to increasing number of frost free days. As well as squeezing ecotypes and species, holly, unless managed, is likely to have a detrimental effect on woodland plant diversity, especially sub-canopy herbs, ferns, mosses and fungi, as well as preventing sapling germination.
In short the suggestions are that large changes are afoot and will undoubtedly affect the woodlands in Richmond in the coming years. Woodland should be monitored, with research theses encouraged, and results incorporated within management plans and the development of woodland corridors.

4.5 Flood prevention measures, river control and canalisation disrupting natural hydrological processes within sites

4.6 Diseases and infestation

Generally tree diseases are a natural part of any ecosystem, only in a formal setting are they normally noticed. However there are more insidious diseases assisted perhaps by climate change and international trade, like: Dutch elm disease, sudden Oak death *(Phytophthora ramorum)*, beech bark disease – that is caused by a combination of an insect; the felted beech coccus (*Cryptococcus fagisuga*) and a fungal pathogen *Nectria coccinea*; and sycamore sooty bark disease (*Cryptostroma*). Woodland should be monitored carefully for these diseases including possible beneficial effects. For example, the natural thinning of sycamore and the dense stands of elm suckers - which left alone will eventually acquire the genetic capacity to become woodlands - certainly both have benefits for biodiversity.
The leaf roller moth (*Tortrix viridana*) is a major cause of tree defoliation of Oak trees in Richmond. This caterpillar can cause 80% defoliation by June, meaning the trees must produce new leaves, and with the consequent expenditure of energy there is a decrease in acorn production. However the caterpillars serve as a good food source for birds and the moths for bats, both important mechanisms of bio-control.

4.7 Unnecessary removal of trees and dead wood - over-tidying

Dead Wood and Rotting Trees

It is now well understood that deadwood is essential to the wellbeing of woodland, providing habitats for about 17% of the biota. In broadleaved woodland the insects and fungi associated with unhealthy or dead woodland trees, are an essential and integral part of a woodland trees lifecycle

and indeed, the ecosystem of the habitat as a whole. In the past it was often assumed that deadwood should be removed from woodlands. This may have been for reasons such as for health and safety to the public, aesthetic and economic i.e to make way for new plantings etc. The ecological importance of dead, standing and fallen trees is increasingly been recognised as one of the single most important resources in any woodland - ancient or recent - and so should be retained where ever possible.

Up to a third of woodland insects, including a number of rare species, are dependent on dead wood. It is the substrate for a large proportion of fungi. The Oak Polypore (*Buglossoporus pulvinus*) fungus, for example, that is a UK BAP priority species and on Schedule 8 of the Wildlife and Countryside Act 1981, occurs in Richmond Park on the old Oaks.
Dead wood is used by more than 200 species of fly and some 760 species of beetle, including the Stag Beetle (*Lucanus cervus*) which is becoming rare nationally, but for which Richmond is a stronghold. Dead wood also provides valuable nesting sites for birds, with one third of all woodland birds nesting in holes or cavities of dead trees. In Richmond for example; nesting nuthatches can be seen in Oak in East sheen common, treecreepers can be seen regularly on sycamore, and greater spotted woodpeckers benefit particularly from the maturing and dead birches found on Ham common and in Richmond Park (Isabella plantation for example).
Recent research has suggests that woodpeckers can be thought of as 'architects' of woodland providing 'housing' for species, in that they appear to be vectors for wood decay fungi, facilitating fungal entry to trunks and heartwood, after which a myriad of species can follow.

However in the last few years with the help of organizations like English Nature, The National Trust and the BTCV, this appreciation has been understood and dead wood is often left in place. Richmond Park has a good established policy of leaving dead wood and crown-cutting limbs. Bushy Park has identified the need to conserve more dead wood.
WWF calls on European governments and forest managers to help conserve biodiversity by increasing deadwood in boreal and temperate forests to as much as 20 - 30 cubic meters per hectare by 2030.

4.8 Pollution

Contrary to claims of forest decline, in most of Europe growth rate of trees are increasing. As well as changes in management practices, increased CO_2 concentration, nitrogen deposition and changed climatic conditions are implicated. It has been shown that frost sensitivity has increased in some tree species with increasing air pollution.

Nitrogen deposition changes soil attributes and may have effects on mycorrhizal fungi and influence bryophyte communities. Air polluted with sulphur dioxide (SO_2) has been detrimental to tree lichens since the industrial revolution, but such effects have been ameliorated by air quality control.

There is fear amongst campaigners that a proposed waste incinerator, (which will be the largest in Europe and for which permission has been granted) at Colnbrook near West Drayton, will, together with the increased Heathrow traffic, be detrimental air pollution in Richmond with the prevailing westerly winds.

4.9 Introduction and/or colonization by invasive species

Species such as rhododendron are highly invasive on light soils (which predominate in the borough) and need rigorous control or good management as in Richmond Park. Sycamore, Holm Oak, Holly, Norway maple and Cherry laurel may also become a problem crowding out more native species.

4.10 Lack of knowledge and information collation

A systematic approach to surveying and recording the whole resource is needed, as with the Ancient Parkland and Veteran Trees HAP. Railway lands woodlands and scrub need to be recorded and assessed.
The considerable biodiversity information that exists with groups and individuals in the borough has not been centralized and information exchanged - this BAP aims to redress this.

5. Current Action

5.1 Legal status of sites with broadleaved woodland and scrub

A number of mechanisms exist to ensure the protection and conservation of woodland and trees:

- The primary legislation is the Forestry Act (1967), which is administered by the Forestry Commission.
- All applications for felling licenses are assessed against the requirements of the UK Forestry Standard (1998), which takes into account biodiversity considerations.
- Tree Preservation Orders (TPOs) and those trees within residential Conservation Areas, designated by local authorities; prevent unnecessary damage to or felling of trees.

In addition, some sites have protective designations such as English Nature's Sites of Special Scientific Interest (SSSI). Other designations are identified in local authority plans and highlight the importance of these areas within the planning process (Listed below in Table 1)

Table 1: List of UK Site designations of broadleaved woodland within LB Richmond,

N.B. Other important woodland sites exist without site designations

Site name	National Nature Reserve	World Heritage Site	Site of Special Scientific	Local Nature Reserve	Metropolitan Open Land	Metropolitan Green Belt	Site of Metropolitan Importance	Site of Borough Importance	Site of Local Importance
Acronym	**NNR**	**WHS**	**SSSI**	**LNR**	**MOL**	**MGB**	**SMI**	**SBI**	**SLI**
Barnes Common			√ (former)	√	√		√		
Barn Elms Playing Fields					√			√	
Bushy Park					√		√		
Crane Corridor					√	√	√		
Crane Park Island				√	√	√			
Duke of Northumber-lands River									√
East Sheen Common					√		√		

Site name	National Nature Reserve	World Heritage Site	Site of Special Scientific	Local Nature Reserve	Metropolitan Open Land	Metropolitan Green Belt	Site of Metropolitan Importance	Site of Borough Importance	Site of Local Importance
East Sheen and Richmond Cemeteries					√				√
Fulwell Golf Course					√				√
Ham Lands				√	√		√		
Ham Common				√	√		√		
Heath Gardens Scrub									√
Hydes Field					√	√		√	
Kew Meadow Path					√			√	
Marble Hill Park					√				√
Occupation Lane Kew									√
Old Deer Park,								√	
Orleans House Gardens					√				√
Ormond Bank							√		
Palewell Common					√		√		
Pesthouse Common					√				
Petersham Common					√		√		√
Petersham Lodge Woods					√			√	
Richmond Park (also SAC)	√		√		√				
Richmond Cemetery									√
Royal Botanic Gardens Kew.		√			√		√		
Twickenham Junction Rough					√				√

Site name	National Nature Reserve	World Heritage Site	Site of Special Scientific	Local Nature Reserve	Metropolitan Open Land	Metropolitan Green Belt	Site of Metropolitan Importance	Site of Borough Importance	Site of Local Importance
Twickenham Golf Course					√				
The Cassel Hospital									√
The Copse Ham					√			√	
The Copse (Hampton Wick)					√				√
The Crane Corridor							√		
7 Thames wooded islands					√	√			
Strawberry Hill Golf Course					√				√

5.2 Mechanisms Targeting the Habitat

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 7.

5.2.1 Woodland Grants Scheme (Forestry Commission and DEFRA). For example The Copse at Ham and Ham Common Woods have been supported.

5.2.2 Woodland Trust grants via the Community Woodland Network.

5.2.3 The Kew Society

The Kew Society green sub-committee monitors green spaces within Kew including broadleaved woodland such as the Thames towpath, Occupation Lane, Pensford field. The society has undertaken native tree planting, rubbish clearance and monitor habitat threats. Work is undertaken with Richmond borough council and BTCV.

6. Flagship Species

These special plants and animals are characteristic of broadleaved woodland in LB Richmond.

Lesser Spotted Woodpecker	*Dendrocopos minor*	The smallest and least common of the 3 British woodpeckers. They breed in broadleaved woodland, parks and orchards, and seem to like river valley alders or regenerating elm. They need decaying wood for nest sites as they make a new nest chamber each year. They are in rapid decline in the UK
European Alder	*Alnus glutinosa*	A specialist riparian or wetland tree. Shiny leaves and small cones. Has nitrogen fixing root bacteria (*Frankia* sp.). Some good examples have colonized the river revetment but not common in borough.
Native Bluebell	*Hyacinthoides nonscripta*	Grows in established woodland subject genetic erosion through hybridization with the Garden or Spanish Bluebell (*H. hispanica*)
Treecreeper	*Certhia familiaris*	Small, very active tree bark specialist, It is speckled brown above and mainly white below with long, slender, down curved bill. BTO research suggests that it is in decline.
Bats	Including *Pipistrellus sp.* Noctule bat *(Nyctalus noctula)*	Winged mammals. Many bats use healthy hollow trees for winter and summer roosts.
Two Lipped Door Snail	*Lacinaria biplicata*	A spire shelled mollusc. Its habitat is soil surface (usually with ivy cover) of occasionally flooded riparian land in the shade of closed canopy woodland.
Beetles	Including Stag beetle (see SAP) and Cardinal Click beetles (*Ampedus cardinalis*)	The greatest threat to this cardinal click beetle is the felling of veteran Oaks
Oak	*Quercus robur*	Emblematic of Richmond; one of the longest lived trees in the UK. It serves as host to more species of birds, bats and invertebrates than any other tree.
Purple Hairstreak (butterfly)	*Quercusia quercus*	Dark wings flash iridescent violet purple. Only foodplant are Oaks. Require undisturbed leaf litter and ground layer for pupation (leaf blowers are bad). Can be seen in hundreds flitting over Oak tree crowns.

7. Objectives, Actions and Targets

Most of these actions are specific to this habitat. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: To Ensure no further loss of broadleaved woodland.
Target: To encourage site protection and appropriate management of woodland area in Richmond

Action	Target Date	Lead	Other Partners
1.1 Establish a working group to develop advice, promote knowledge and exchange ideas and expertise	2005	RBG Kew	LA, TRP, HRP
1.2 Increase use of WGS or its replacement Ensure all woodland sites in LB Richmond are certified	2006/7	LA	FC
1.3 Ensure all woodland sites in LB Richmond are certified by Forestry Commission	2007	LA	FC
1.4 Start process for possible stronger site designations	2007	Working Group	LA, EN

Objective 2: Carry out a survey and map the distribution of all existing broadleaved woodland in London Borough of Richmond upon Thames
Target: To input the data onto a Geographical Information System (GIS) by 2007

Action	Target Date	Lead	Other Partners
2.1 Carry out a survey of the condition of Richmond's broad-leaved woodlands including the extent to which they are managed Map the distribution of all existing broadleaved woodland with ground truthing	2006/7	RBG Kew	Working Group, LA

Objective 3: Identify biodiversity and habitats in all broadleaved woodland
Targets: (1) Collate information and input onto The Richmond Biodiversity Group website for public usage
(2) Identify the biodiversity value of all broad-leaved woodlands and ensure protection of all important woodland species

Action	Target Date	Lead	Other Partners
3.1 Record species and structural diversity as a precursor to possible active management such as: coppicing, thinning, selective felling.	2007	RBG, Working Group	London Universities LWT, LBP
3.2 Ensure appropriate practices such as natural regeneration of native species are in place within Richmond's broadleaved woodlands.	2007	RBG, Working group	London Universities London Wildlife trust LBP

Objective 4: Increase and promote public benefit, understanding and community involvement in Richmond's woodlands through education and research
Targets: (1) Encourage at least 1 Masters student to undertake research on biodiversity and ecological studies of woodlands annually
(2) Collate existing and new information in The Richmond Biodiversity Group website
(3) To provide 2 Woodland field days for local schools each year/by 2006

Action	Target Date	Lead	Other Partners
4.1 Produce information sharing website to ensure biodiversity research results are easily shared	2006	RBG, RBG Kew	LA, GIGL
4.2 Encourage and establish monitoring to measure woodland dynamics	2007	Working Group, LA	London Universities
4.3 Start Education program to stimulate understanding and involvement	2007	Working Group,	LA

Objective 5: Expand and link the area of broadleaved woodlands, especially in areas of woodland deficiency
Target: Identify where areas of deficiency are by 2007

Action	Target Date	Lead	Other Partners
5.1 Identify existing woodland corridors and gaps	2007	RBG, RBG Kew	TLS Kew Society Working group
5.2 Provide and stimulate in private gardens and other corridor areas native planting and wildlife sensitive practice	2007	RBG, RBG Kew	Kew Society

Relevant Action Plans

Local Plans
Ancient Parkland/Veteran trees, Acid Grassland, Tidal Thames, bats, Stag beetle, Mistletoe

London Plans
Woodland; Tidal Thames, Private gardens, Black poplar native (Populus nigra spp.betulifolia), Bats, Mistletoe, Stag beetle, Churchyards & Cemeteries, Wasteland, Heathland,

Open landscapes with ancient/old trees habitat audit; Tidal Thames habitat audit; Private gardens habitat statement; Marshland habitat audit, Farmland Audit, Railway Linesides audit

National Plans
Wet woodland, Lowland mixed deciduous woodland, Lowland wood-pasture, Ancient and/or species-rich hedgerows and parkland,

Bullfinch (*Pyrrhula pyrrhula*), Stag Beetle (*Lucanus cervus*) Cut-grass (*Leersia oryzoides*)

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Abbreviations

EN – English Nature
FC - Forestry Commission
GIGL – Greenspace Information for Greater London
GLA – Greater London Authority
HRP – Historic Royal Palaces (Hampton Court and Home Park)
LA – Local Authority (London Borough of Richmond upon Thames)
LBP – London Biodiversity Partnership
LWT – London Wildlife Trust
RBG – Richmond Biodiversity Group
RBGK – Royal Botanic Gardens Kew
TRP – The Royal Parks
TLS - Thames Landscape Strategy
WGS - Woodland Grants Scheme

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Appendix

List of tree and shrub species that are native (or probably so) to the London Borough of Richmond upon Thames.

Alder	*Alnus glutinosa*
Alder Buckthorn	*Frangula alnus*
Ash	*Fraxinus excelsior*
Aspen	*Populus tremula*
Birch, Downy or Brown	*Betula pubescens*
Birch, Silver	*Betula pendula*
Bird Cherry	*Prunus padus*
Blackthorn	*Prunus spinosa*.
Black Poplar, native variety only	*Populus nigra* var *betulifolia*
Crab Apple	*Malus sylvestris*
Elder	*Sambucus nigra*
Elm, English	*Ulmus procera*
Elm, Wych	*Ulmus glabra*
Elm, hybrids with *U. minor*?	*Ulmus* sp.
Dogwood	*Cornus sanguinea*
Field maple	*Acer campestre*
Gean, or Wild Cherry	*Prunus avium*
Gorse, Common	*Ulex europaeus*
Hazel	*Corylus avellana*
Hawthorn, Common	*Crataegus monogyna*
Hawthorn, Midland	*Crataegus laevigata*
Holly	*Ilex aquifolium*
Hornbeam	*Carpinus betulus*.
Lime, Small-leaved	*Tilia cordata*
Oak, English	*Quercus robur*
Oak, Sessile	*Quercus sessilis*
Privet, Wild	*Ligustrum vulgare*
Rowan	*Sorbus aucuparia*
Spindle	*Euonymus europaeus*

Willow, Crack	*Salix fragilis*
Willow, Goat	*S. caprea* - also known as Great Sallow
Willow, Grey	*S. cinerea* - also known as Grey Sallow.
Willow, White	*S. alba*
Yew	*Taxus baccata*

Sweet Chestnut, Grey Poplar, Damson and Bullace are usually treated as 'honorary natives'. The hybrid known as Common Lime, & Weeping Willow are also often accepted as honorary natives too.
Native status is ascertained by analysis of the pollen content of post-glacial deposits.

List of tree and shrub species that are <u>not native</u> to the British Isles, but which are known to naturalize within the wilder habitats of the London Borough of Richmond.

Cherry Laurel	*Prunus laurocerasus* (more correctly Laurel Cherry)
Cherry Plum	*Prunus cerasifera*
Cotoneaster	*Cotoneaster* sp.
Holm Oak	*Quercus ilex*
Honey Locust	*Robinia pseudoacacia*
Horse Chestnut	*Aesculus hippocastaneum*
Plane, London	*Platanus x hispanica*
Plane, Oriental	*P. orientalis*
Rhododendron	*Rhododendron ponticum*
Turkey Oak	*Quercus cerris*
Norway Maple	*Acer platanoides*
Poplars	*Populus* sp. not those listed under native.
Swamp Cypress	*Taxodium distichum*
Swedish Whitebeam	*Sorbus intermedia*
Snowberry	*Symphoricarpos albus*
Sycamore/ Great maple	*Acer pseudoplatanus*

Richmond upon Thames
Habitat Action Plan
Reedbeds

Reedbeds and Bittern © Mike Waite

"Over most of this century the Pen Ponds and its associated reedbed has been a focal point for naturalists, particularly ornithologists. The reedbed, a formerly totally enclosed area, often called the Sanctuary or reserve, has or should have the widest diversity of wildlife anywhere in the Park."

(Barry Marsh, 'The Pen Ponds Reedbed', *The Richmond Park Magazine*, Autumn 1998)

1. Aims

- To ensure the protection and optimal management of reedbeds in LB Richmond.
- To demonstrate the value of reedbeds and to promote their creation and restoration in the Borough's environment.

2. Introduction

Reedbeds are areas of shallow water dominated by a tall wetland grass called common reed (*Phragmites australis*). The UK's largest native grass, common reed is a particularly conspicuous species, with cane-like stems that last throughout the winter. Reedbeds in LB Richmond occur at the margins of all kinds of water bodies and alongside several other habitats, including wet woodlands and willow-dominated scrub.

Historically, the Thames Estuary and basin would have supported extensive reedbeds Most of LB Richmond's natural reedbeds are today confined to a few principal sites, with most owing their existence to planting and restoration programmes undertaken during the course of the 20th Century. These man-made reedbeds are associated with a variety of current and post-industrial structures, including restored gravel workings (e.g. M82 Richmond Park's Pen Ponds: from gravel extraction in the 1600s) and redundant reservoirs (e.g. BI 2 Lonsdale Road Reservoir (or Leg o' Mutton) LNR and M87 London Wetland Centre / Barnes Waterside Pond). Recently, the demand from alternative water treatment applications has added further small-scale reedbeds, especially within the most built-up sectors of the Capital, to perform multi-functional roles including filtration of nutrients, removal of harmful pollutants and storage of urban run-off and floodwater. This type of reedbed could become part of the matrix of LB Richmond's reedbeds, if the local authorities see a demand for these structures over the course of the 21st Century.

Despite the small size of LB Richmond's reedbeds, they remain home to many of London's more interesting and regionally uncommon wildlife. Secretive birds such as the water rail, reed and sedge warblers, the rapidly declining water vole, and a host of both drab and colourful invertebrate species, are dependent on the dense cover provided by reedbeds. Historically, London rarities

such as the harvest mouse would have undoubtedly utilised this habitat. The current status of this small mammal in the borough is now uncertain and quite possibly has become extinct; however, some of LB Richmond's larger reedbed sites (e.g. London Wetland Centre) might provide opportunities for introduction programmes for the species. Relative newcomers to LB Richmond include the enigmatic bittern and Cetti's warbler. The bittern has spent recent winters in reedbeds (e.g. Richmond Park's Pen Ponds, Lonsdale Road Reservoir LNR and London Wetland Centre) only a few miles away from Westminster.

3. Current Status

Across the UK, up to 40% of reedbed habitats were lost between the years of 1945 and 1990. Reedbeds are therefore considered a nationally scarce habitat and are a priority habitat for conservation in the UK Biodiversity Action Plan (DOE, 1995). They are an important habitat for several nationally rare breeding birds in the UK, some of which have bred in Greater London (for example Cetti's warbler and bearded tit). Within the Thames catchment, reedbeds were assessed by the Environment Agency in 2000 to cover 228 ha across 79 sites.

The habitat in London is estimated at 43.5 ha, covering a fraction (0.03%) of the Capital's surface area. The largest continuous areas occur in the Roding Creek (LB Newham) and the Ingrebourne Valley (LB Havering). LB Richmond has three principal sites, notably London Wetland Centre (2 ha), Lonsdale Road Reservoir LNR (0.5 ha) and Richmond Park's Pen Ponds (0.5 ha). LB Richmond reedbeds thereby form almost 7% of the Greater London reedbed audit. Stands under 0.5 ha were not included in the original LB Richmond reedbeds audit, and such areas represent an important additional resource (estimated at forming a further 1 ha of reed cover). These include many of the marginal reedbeds recently established in London's large Victorian ponds, aimed at reducing the highly eutrophic conditions of these urban wetlands (e.g. L11 Kew Pond and L12 Barnes Green Pond). Other examples include the small reedbeds in M76 Crane Park Island LNR and M87 Barnes Waterside Pond (used to be part of the Barn Elms Reservoir site), which despite their sizes respectively support a thriving population of water voles and reed warblers. The transient nature of reedbeds underlies the importance of regular re-surveys to retain an accurate overview of the habitat resource across the borough; for example, newly discovered reedbeds from the GLA audit in 2001 (e.g. damp pastures east of M84 Hampton Court Park and an abandoned filter bed in the Hampton Treatment Waterworks close to M85 Stain Hill Reservoirs), as well as drying out reedbeds that run the risk of being lost (e.g. on M83 Ham Lands LNR).

To counter their decline, there is growing pressure nationally to plan for the creation of reedbeds wherever this might be appropriate, often backed by financial incentives. Good examples of habitat creation within the borough include the London Wetland Centre, at Lonsdale Road Reservoir LNR and Crane Park Island LNR. Future planned reedbed restoration (e.g. Richmond Park's Pen Ponds) and creation schemes (e.g. M31 River Thames and BII 9 Beverley Brook) might well reverse the decline of what was a trademark feature of both the borough's and London's landscape.

Other pond sites in the borough, which have been identified as containing small reedbeds would include M82 Richmond Park's Dan's Pond and Holly Lodge Pond, M82 Palewell Common, M84 Bushy Park, BI 1 Royal Botanic Gardens Kew, L3 Pensford Field and L13 Ham Pond. Furthermore, there are a few schools in the borough with ponds containing reeds including Sheen Common Vineyard School, Collis School and Hampton Wick School.

4. Specific Factors Affecting the Habitat

4.1 Sea level rise

The projected rise in sea level may lead to a net attrition of created reedbeds proposed for the Arcadia project along the tidal reaches of the River Thames, through physical erosion and changes in salinity. Opportunities for flood defence realignment (and associated reedbed creation) are severely limited on the tidal Thames in most of Greater London, although in LB Richmond there have been past proposals for such a scheme in part of Ham Lands.

4.2 Development and habitat loss

Extensive reeds would have marked every major tributary's floodplain, delta and creek mouth, prior to the widespread land drainage and flood defence schemes essential to the development of the modern city. The majority of LB Richmond's reedbeds are afforded some protection as part of London SINCs and under the borough's UDP. Although development is unlikely to directly have an impact on reedbeds, one or two have had developments occur in close proximity to them e.g. Barnes Waterside Pond.

4.3 Water quality

Pollution of freshwater affects reedbeds, and can result in amphibian and fish kills, the accumulation of toxins in the food chain, and excessive eutrophication, causing the reeds to die back. The high volume of storm-water run off from the non-absorptive surfaces of the built environment is an additional source of pollutants particularly associated with the urban situation. This could not only have an impact on any newly created reedbeds on the River Thames as part of the Arcadia project, but also on reedbeds in water bodies that take top-up water directly from the River Thames e.g. Kew Pond, Lonsdale Road Reservoir LNR and London Wetland Centre.

4.4 Water quantity

Many London watercourses experience low freshwater flows in summer due to over-abstraction upstream. On the tidal Thames and creeks, this raises salinity levels further upstream, which could damage freshwater plant communities (e.g. any reedbed creation on the Thames as part of the Arcadia project). Low flows can also dry out marginal vegetation, increasing the speed of natural succession with the onset of scrub and woodland colonisation (e.g. the dry reedbed on Ham Lands LNR).

4.5 Management issues

The RSPB has identified management neglect as the major contributing factor leading to reedbed losses across the UK in the last 20 years (Hawke & José, 1996). Inappropriate management includes lack of intervention in wet woodland colonisation. For example, the cause of the diminishing area of reedbed at Pen Ponds and along the River Crane has been identified in part due to encroachment into the reeds of alder / willow carr.

4.6 Problem species

Reedbeds are particularly vulnerable to problems caused by invasive, non-native species. These include overgrazing of recently planted or cut-over reeds by Canada Geese, and bank destabilisation by Chinese mitten crabs (which have been found in a number of water bodies located adjacent to the River Thames).

4.7 Recreational activities

Water-based recreation is increasing in popularity, including angling and waterborne transport. Unless managed carefully, this can disturb reedbeds and their wildlife, for example by disrupting breeding birds. During summer, increased public access could leave drier reedbeds more vulnerable to deliberate or accidental destruction by fire.

4.8 Public perception

Small, urban reedbeds are likely to be perceived as lacking any substantial biodiversity value, particularly as their associated wildlife is typically elusive. Reedbeds may even be viewed as unsightly (trapping wind-blown or tidal rubbish, and blocking views to open water). Some anglers may forget the importance of reedbeds as fish spawning grounds and view them as a hazard, which entangles fishing line and prevents clear line casting. Furthermore, landowners tend to see no economic benefits for retaining reedbeds within an agricultural context, although the Countryside Stewardship Scheme has subsidised reedbed management in a number of the London boroughs.

5. Current Action

5.1 Legal status

All of the larger reedbeds identified in the LB Richmond audit, as well as most of the smaller examples, are included within Sites of Importance for Nature Conservation (SINC). There will remain some smaller reedbeds that are not protected through the planning system, especially those within wetland creation schemes in recently completed developments.

Some reedbed sites receive statutory protection as Sites of Special Scientific Interest (SSSI) and/or Local Nature Reserves (LNR). SSSIs with important reedbeds include the London Wetland Centre and Pen Ponds in Richmond Park, with the latter location also lying within a National Nature Reserve. Meanwhile, Lonsdale Road Reservoir, Ham Lands and Crane Park Island have been notified as LNRs.

Specially protected species often associated with the habitat in LB Richmond include not only kingfisher and water vole, but also less frequently grass snake and great crested newt. Both the bittern and Cetti's warbler are now regular wintering species at the London Wetland Centre, with occasional records of bearded tit also being made at the same site in the past few winters.

5.2 Mechanisms Targeting the Habitat

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 7.

5.2.1 Management, creation and guidance

In most protected sites, there is a clear priority to maintain the integrity of their reedbed habitats by monitoring both water level and quality. None of LB Richmond's reedbeds are large enough to be harvested traditionally. However, some rotational cutting is undertaken in nature reserves both for the benefit of the reedbed faunal assemblage and to prevent loss of reedbed habitat from encroachment by wet scrub or woodland (for example at the London Wetland Centre, Lonsdale Road Reservoir and Crane Park Island Nature Reserve). There are also examples of organisations putting resources into reedbed restoration projects, for example Pen Ponds reedbed in Richmond Park.

Many smaller reedbeds have been planted to improve the biodiversity and water quality of more established urban wetland features, such as in ponds of some of the borough's formal greens (e.g. Barnes and Kew Greens). Future creation schemes might also include restructured watercourses (e.g. Beverley Brook). Others are planned to form part of wider landscape restoration schemes alongside the River Thames, such as the Thames Landscape Strategy's Arcadia project.

Boardwalks have been constructed to allow access and improved interpretative opportunities at a number of sites e.g. the London Wetland Centre.

Several agencies have produced guidance documents to encourage the management and creation of reedbeds, including the RSPB/EN leaflet `Reedbed Management for Bitterns` and the handbook `Reedbed Management for Commercial and Wildlife Interests` (Hawke & José, 1996).

5.2.2 Bittern Recovery Project

In 1996, English Nature launched its Action for Bittern (Species Recovery) Project, with EU LIFE funding available to landowners and NGOs for reedbed management and restoration. Bitterns are now starting to show signs of recovery in some parts of the UK. They have regularly over-wintered in LB Richmond's reedbeds for the past 4-5 winters (e.g. Richmond Park's Pen Ponds and the London Wetland Centre), and creation of new reedbeds elsewhere in the borough would serve to enhance habitat continuity.

5.2.3 SuD and Bioremediation Schemes

Another driver for reedbed creation is the growing interest in Sustainable urban Drainage systems (SuDs) and bioremediation schemes. However, their wildlife value can often be compromised by the temporary nature of the schemes. Nevertheless, they remain important steppingstones along wildlife corridors for species strongly associated with the habitat.

Policies requiring SuD schemes within new developments are beginning to feature in planning policy documents and guidance.

6. Flagship Species

These special plants and animals are characteristic of reedbeds in LB Richmond.

Water Vole	*Arvicola terrestris*	The "water rat" of the literary classic "The Wind in the Willows" is often mistaken for the brown rat. However, the water vole has a blunt nose, a shorter hairy tail and a pair of small ears tucked away within its fur. It is Britain's fastest declining mammal, yet some of its UK strongholds are associated with London reedbeds. Good populations occur in reedbeds at Crane Park Island LNR, London Wetland Centre and on the Longford River in Bushy Park.
Bittern	*Botaurus stellaris*	A secretive and rare bird that breeds in large, secluded reedbeds. However, smaller reedbeds, including Pen Ponds and London Wetland Centre, can provide important refuges for over-wintering bitterns from both the UK and the continent. They feed on fish, amphibians, small mammals and large insects, especially among the reedbed margins.
Reed warbler	*Acrocephalus scirpaceus*	Although they can be hard to spot among the reeds, the noisy chattering song of these summer visitors can be heard in the borough's larger reedbeds e.g. Pen Ponds, Lonsdale Road Reservoir and London Wetland Centre. Although they are attracted to quite small reedbeds, they do need undisturbed areas of dense vegetation in which to build their nests. They feed on the abundant insect life of the wetland edge habitat.

Common eel	*Anguilla anguilla*	Eels are an important food source for many animals, in particular herons and bitterns. Eels are one of a number of fish for which reedbeds provide important shelter on the edge of the open water. They breed in the sea and the young migrate up the Thames and streams and overland to colonise Richmond's freshwater bodies where they grow for at least 15 years before maturing.
Ruddy darter	*Sympetrum sanguineum*	A beautiful dragonfly with bright crimson-red males. It is scarcer than the closely related common darter, but occurs in some of Richmond's wetlands inhabiting shallow, still water where there is an abundance of bulrushes amidst reeds and other emergent plants.
***Twin-spotted wainscot**	*Archanara geminipuncta*	This species is representative of a large community of resident reed-feeding wainscot moths. It spends the winter as an egg. The caterpillar then feeds (head upwards) and pupates within reed stems. Adults fly from August to mid-September and have a distinctive pair of white spots on their forewings.
Common reed	*Phragmites australis*	The key species of the reedbed habitat - tall stands of reeds, with large purplish flower-heads, which rustle in the slightest breeze. Reedbeds provide shelter, nest-sites and food for a very wide range of wildlife.

***Some additional notes:**

Other moths partly or wholly dependent on common reed in the London area that would also benefit from the action plan would include: the macro-moths southern wainscot, large wainscot, fen wainscot, silky wainscot and brown-veined wainscot, and the micro-moths *Schoenobius gigantella* (Nationally Notable) and *Chilo phragmitella*. There are also a number of moths that would benefit from the presence of bulrushes, yellow iris, and other emergent plants that grow within and around reedbeds. These would include: the bulrush wainscot, Webb's wainscot and the small rufous. The inclusion of willow would benefit the cream-bordered green pea and lunar hornet clearwing.

7. Objectives, Actions and Targets

Most of these actions are specific to this habitat. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: To increase LB Richmond's overall reedbed habitat resource
Target: Increase the combined current area (4 ha) of large and small reedbeds in Richmond by 25% (1ha) by 2010

Action	Target Date	Lead	Other Partners
1.1 Conduct questionnaire-based survey of Richmond's reedbeds	2006	Working Group	Site managers, LNHS
1.2 Promote use of reedbeds to developers and planning authorities as part of a London SuDs (Sustainable Urban Drainage Systems) conference	2006	GLA	Landowners, developers, LA, EA, WWT
1.3 Implement at least 2 reedbed creation projects each of $20m^2$ or larger	2010	TLS	LA, EA, BTCV
1.4 Establish 5 new small reedbeds where opportunities occur and in areas of known deficiency	2010	LA	Site managers, landowners, developers, EA, TRP, RPWG, BPWG, TLS, FBC, BTCV, RBG Kew, Schools
1.5 Ensure that reedbed restoration management in Richmond Park's Pen Ponds establishes an overall increase in total reedbed area	2010	TRP	EN, RPWG

Objective 2: Ensure appropriate management and enhancement of all reedbeds within Richmond
Target: All reedbeds of $10m^2$ and larger to be under appropriate management by 2009

Action	Target Date	Lead	Other Partners
2.1 Produce best practice habitat management guidelines	2008	Working Group	Site managers, landowners, LA, RPWG, BPWG, FBC, LRMG, RBG Kew
2.2 Distribute best practice guidelines to all appropriate reedbed managers	2009	Working Group	Site managers, landowners, LRMG, RBG Kew, Schools
2.3 Ensure management plans are produced for all newly created reedbeds	2012	TLS	Site managers, landowners, developers, LA, EA, TRP, BTCV, RBG Kew

Objective 3: Increase public awareness, knowledge and understanding of reedbeds
Target: Provision of cultural and ecological interpretation at all key locations by 2010

Action	Target Date	Lead	Other Partners
3.1 Develop an annual programme of reedbed-focused events and activities across LB Richmond	2006	Working Group	RBG Kew, Schools
3.2 Publish a promotional leaflet on LB Richmond's key or accessible reedbeds	2008	Working Group	RPWG, BPWG, FBC, LRMG, RBG Kew
3.3 Promote the potential for introduction / recovery programmes for future flagship species, which utilise larger reedbeds, but are now rare or extinct in LB Richmond e.g. Harvest Mouse.	2011	WWT	EN, EA, GLA, LA, LWT, TRP, TLS

Relevant Action Plans

Local Plans
Water Vole; Tidal Thames, Amphibians (including Great Crested Newts), Bats

London Plans
Canals; Reedbeds; Rivers & Streams; The Tidal Thames; Bats; Water Vole; Grey Heron; Sand Martin; Reptiles; Grazing Marsh & Floodplain Grassland Audit; Marshland Audit; Ponds, Lakes & Reservoirs Audit.

National Plans
Built Environment & Gardens; Canals; Coastal & Floodplain Grazing Marsh; Estuaries; Fens, Carr, Marsh, Swamp & Reedbed (also separate Reedbed HAP costed plan); Rivers & Streams; Standing Open Water

Key References

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Abbreviations

BPWG – Bushy Park Wildlife Group
EA – Environment Agency
EN – English Nature
FBC – Friends of Barnes Common
GLA – Greater London Authority
LA – Local Authority (LB Richmond)
LNHS – London Natural History Society
LRMG – Lonsdale Road Management Group
LWT – London Wildlife Trust
RPWG – Richmond Park Wildlife Group
RBG Kew – Royal Botanic Gardens Kew
TLS – Thames Landscape Strategy
TRP – The Royal Parks
TW – Thames Water
WWT – Wildfowl & Wetlands Trust
Working Group – BTCV, EA, GLA, LA, LWT, TRP, TLS (Arcadia), WWT

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Richmond upon Thames
Habitat Action Plan
Tidal Thames

The Thames looking down-stream, passed Kew Gardens and Syon tidal flood meadow © Oliver Whaley

"My eye, descending from the hill, surveys,
Where Thames among the wanton valleys strays;
Thames, the most loved of all the ocean's sons;
By his old sire, to his embraces runs,
Hasting to pay his tribute to the sea,
Like mortal life to meet eternity."
(From "The Thames" by Sir John Denham, 1615 – 1668)

1. Aims

- To identify and quantify the wildlife habitats and species of the tidal Thames
- To ensure the improvement, regeneration and integration of tidal Thames habitats
- To contribute to strategic efforts to deliver biodiversity conservation targets for the tidal Thames as a whole.
- To promote public education, appreciation and research of the tidal (and non-tidal) Thames within the Borough

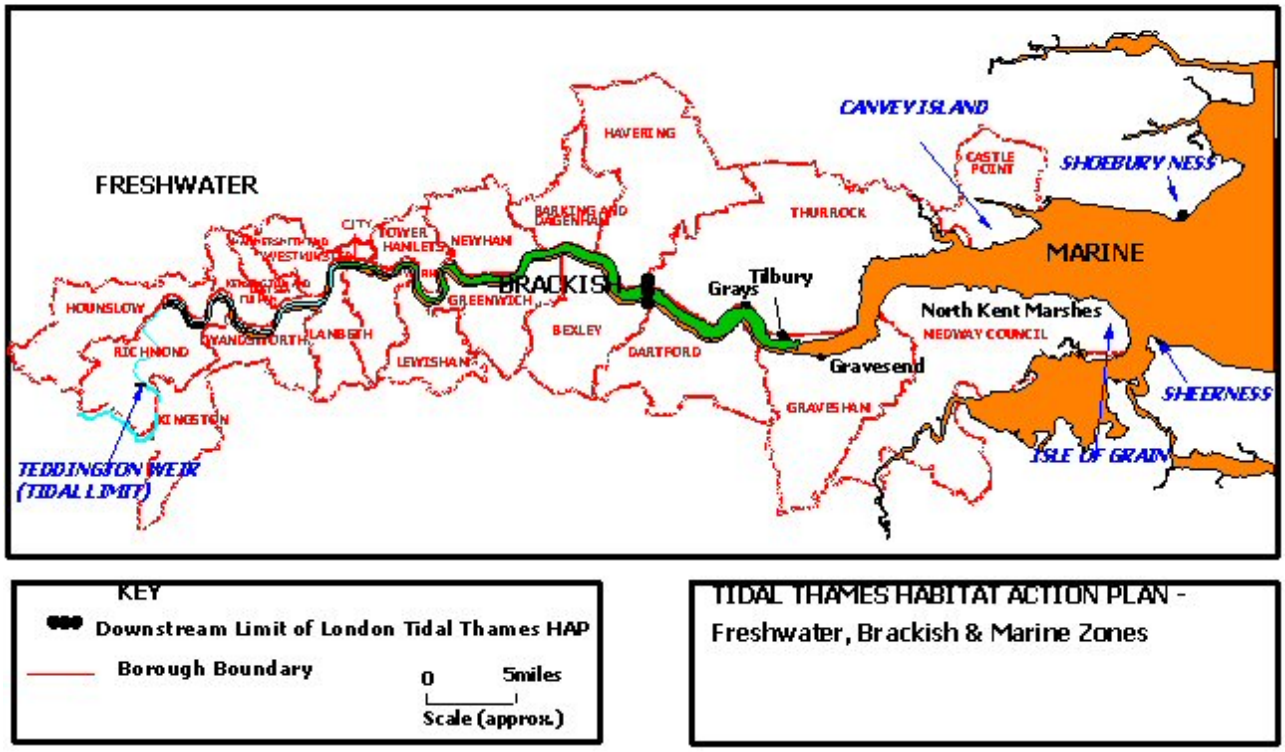
2. Introduction

By the time the Thames reaches London it has flowed over 300 kms from its source in the Cotswolds; it has however traditionally been known as "London's River" or "old Father Thames" and has been a landscape of inspiration to the capital for two thousand years. The original meaning of the name 'Thames' tells us something about its character. The name is perhaps derived from the Celtic language root *Tam,* meaning 'dark' or more likely from a pre-Celtic root *Ta* meaning 'melt, flow turbidly'.

The history of the river in Richmond Borough is no less important and is evident from finds of Stone Age tools on Eel Pie Island; flint implements and Celtic and Roman pottery on Ham lands. The river has been an inspiration to Alexander Pope and Turner. Its serpentine presence through the Borough does much to define its life and character and is symbolised within the Borough Council logo.

The London Borough of Richmond upon Thames is unique among the London Boroughs in extending both north and south of the River Thames. The tidal limit of the Thames is within the

Borough, at Teddington Lock (although it is noted that this can be breached on extreme high tides). The western boundary of the Borough extends a further 12 km upstream on the north bank of the river. The London wide Tidal Thames HAP has selected the Richmond Borough boundary as its western limit as it also represents the western boundary of the Greater London Authority (GLA). This plan has also been extended to include the non-tidal reaches.



The riverbanks within the Richmond Tidal Thames Habitat Action Plan (HAP) are:

Non-tidal

- The north bank upstream (12 km) of Teddington Lock, to the west end of Hampton Water Works

Tidal

- The north and south banks downstream (8 km) of Teddington Lock, to the confluence with the River Crane (the boundary with the London Borough of Hounslow)
- The south bank downstream (12 km) to the confluence with the Beverley Brook (the boundary with the London Borough of Wandsworth)

The Borough boundary runs along the centre of the river except where it moves around islands. Some Islands, such as Taggs Island are included and others, such as Isleworth Ait excluded.

The lateral extent of the plan area includes:

- The river bed and the 11 Thames islands within the Borough
- The (short) tidal reaches of associated tributaries but excludes their main fluvial channels. (These will be included in a subsequent "Rivers and Streams HAP" for the Borough)
- The banks, towpaths and other riverside pathways and associated flood channels, back channels and backlands. This includes rare marginal habitats of flooded forest and wet woodland.
- The floodplain. For example Petersham Meadows is within the current flood plain and Ham Lands, which may be returned to flood plain as part of the "Floodscape" project.

The Richmond section of the river is part of the upper "freshwater zone" of the wider Tidal Thames, which stretches downstream through central London to the estuary, and coastal marshes of Essex and Kent. A Habitat Action Plan for the wider Tidal Thames has been prepared on behalf of GLA by the Thames Estuary Partnership and is a key reference for this plan.

3. Current Status

3.1 Overview

The river is a valuable amenity to Borough residents and visitors and provides a mode of transport for some commercial and much seasonal leisure traffic. It receives much of our treated effluent and urban run-off whilst also providing a vital wildlife corridor for the migration of wildlife between urban parks and green space. Locally, these areas include; the Barnes wetland centre, Bushy Park, Ham Common and Lands, Marble Hill House, Syon Park SSSI, Richmond Park SSSI and Kew Gardens World Heritage Site.

Ecologically the Thames today can be thought of as a recovering ecosystem. Only 40- 50 years ago it was considered almost biologically dead, whilst today its healthy fish stocks indicate its present status as a good quality urban water environment. It was recognised to be one of the cleanest rivers flowing through a European city in 2005. The main reason for this is the additional treatment of sewage effluent, before it is discharged to the tidal reaches, resulting from European and UK legislation.

Over 100 species of fish are currently recorded in the wider tidal Thames with reintroduced salmon running up-river beyond Teddington Lock in 1985 for the first time since the 1830's.
The tidal Thames is still far from being a natural eco-system, with its controlled river course, little natural flood meadow and bank-side housing development. Its main ecological constraint is the hard engineering to stabilise the riverbanks, consisting of sheet piles, cobbled or concrete revetments. These both reduce the variability of the habitat and severely curtail the surface and subterranean flood plain environment. A further impact is the Richmond Half Lock, which retains an artificial high water level over the bottom half of the tidal cycle in the river upstream. This benefits river navigation but reduces the upstream inter-tidal habitat. Benthic zone habitats are extended however, including several mussel habitats.

Although background water quality has improved, there remains the periodic outflow of untreated effluent from combined sewer systems in response to high rainfall events, which result in reductions in water quality. Continued occasional major incidents should be expected without remedial action, particularly given an anticipated increase in rainfall extremes as predicted by 'climate change'. October 2004 saw such an event when a combination of sewer over-flows and antecedent dry weather conditions, resulted in a rapid lowering of dissolved oxygen in the river water and many thousands of fish were killed.

There is also continued large-scale abstraction of fresh water for public water supply from above Teddington Lock. Although this is regulated by a variable minimum flow control at the lock, it still results in reduced fresh water inflows to the tidal reach throughout the year, and potential changes to river ecology during the low flow summer period.

Specific habitats

3.2.1 River Channel

The river channel habitat is constrained artificially by its hard embankments, resulting in a greater depth and a faster water flow than if the channel was "natural". Although this is largely a tidal reach, the water quality is dominated by the inflow of fresh water from upstream. Marine salinity levels are understood to be low throughout the stretch, although may be elevated in extreme drought periods. Water levels vary according to fresh water inflows and the monthly tidal cycle.

Low levels are mitigated, on the tidal reaches upstream, by the outflow regulation of Richmond Half Lock, and the fresh water upstream reaches are maintained by Teddington Lock.

The in-stream habitat is subject to the seasonal changes of thermocline, oxygen levels and nutrient flows that in turn determine the algal base of the food chain. Algal blooms affect water clarity and colour and subsequent aquatic micro fauna.

In the wider tidal Thames there are over 100 fish species present. The main river habitat in Richmond supports good fish diversity with over 20 species, probably best represented by Bream (*Abramis brama*) - in this 'bream region' of the Thames, with prized angling fish such as Barbel (*Barbus barbus*) and introduced efficient predators like Zander (*Percidea Stizostedion*).

Some marine species such as Flounder (*Platichthys flesus*) use the stretch as a refuge for 3-4 yrs, after which they return to the sea and estuary where they spawn. The river is also used for migrating fish like European eels (*Anguilla anguilla*), and since the mid 1980's re-introduced migratory Salmon (*Salmo salar*) and Sea trout (*Salmo Trutta*) are regularly recorded.
It is important to note that the lack of large in-river waterweeds make the existence of marginal vegetation such as submerged tree roots like crack willow (*Salix fragilis*) and the tidally flooded bankside plants, very important refuges and attachment points for fish eggs during and after spawning.
The fishery and its associated invertebrate fauna, is predated by marine and fresh water birds including Kingfisher (*Alcedo atthis*), Grey heron (*Ardea cinerea*), cormorant (*Phalacrocorax carbo*) and a large number of wildfowl including both Great crested grebe (*Podiceps cristatus*) and Little grebe (*Tachybaptus ruficollis*). The reach is also visited regularly by Common seals (*Phoca vitulina*) from lower down the estuary, and even Bottlenosed dolphins (*Tursiops truncatus*) have been seen as far upstream as Twickenham.

3.2.2 River Bed

There is a considerable seasonal suspended silt load in the river system. This is perhaps enhanced from time to time by dredging activities and flocculation downstream. However, due to the relatively fast flowing nature of the stretch, silt is only deposited in any quantity in minor low-flow areas, especially on the Twickenham and Brentford side of the river, where islands interrupt the flow. These conditions provide important transition zone habitats for benthic fauna, including unionid mussel beds; specifically the Painters mussel (*Unio pictorum*), the Ducks mussel (*Anodonta anatina*) and the less common Swollen river mussel (*Unio tumidus*); whilst also providing for the UK BAP priority species the Depressed river mussel (*Pseudanodonta complanata*). Also found are invasive species such as the Chinese mitten crab *(Eriocheir sinensis)*, the Zebra mussel (*Dreissena polymorpha*) and the Asiatic clam (*Corbicula* sp.).
Non-biting midge larvae (*Chironomus* sp.), leeches (Hirudinea) and Freshwater shrimps (*Gammarus pulex*) are a widespread and an important food source for fish and ducks. The other key riverbed inhabitants, with several species found in the Richmond reaches, are small Orb (*Sphaerium* sp) and Pea (*Pisidium* sp) mussels.

3.2.3 Banks

The combination of the hard banks and the Richmond Half Lock restricts the inter-tidal habitat within the main channel. Gravel and silt banks are exposed downstream of the lock and provide a good habitat for feeding water fowl. In a few places, such as on the foreshore of RBG Kew and the Old Deer Park, Sea Club-rush (*Bolboschoenus maritimus*) and Grey club-rush (*Schoenoplectus tabernaemontani*) provide an important habitat that is used as a spawning ground.

The channel embankments tend to be uniform with steep faces covered with protective hard rock blocks or sheet piles. This provides a restricted habitat with little marginal vegetation or opportunities for roosting. However the concrete and cobbled revetments are increasingly being colonised by Willow (*Salix* sp.) and Alder (*Alnus glutinosa*). There are no natural banks currently within the tidal reaches of the Borough, such as the tidal flood meadows (protected as a SSSI) outside Syon House in Hounslow on the north bank opposite Kew Gardens, and which provide good habitat for a range of species including Reed warblers (*Acrocephalus scirpaceus*)

Recent schemes are attempting to provide more habitat within the channel banks. Local volunteers have installed a softer defence system on the river-side of the flood bank at Kew, consisting of hand built willow stake "living fences" for the retention of silt and the potential development of more natural bank-side habitats and known as "spiles". Recent improvement works at Teddington Lock incorporated soft materials into the new sheet piled banks to allow habitat for soft boring invertebrates and small fish.

The towpath, revetments and associated riverside vegetation forms an important corridor habitat and also represents a key connection to associated habitats such as floodplain and wet woodland. The riparian assemblages of plants in some locations in the Borough are some of the best examples in the tidal Thames and are especially important, as they are also rare on the engineered tributaries. However, being close to the towpath, they suffer from badly timed or heavy mowing that has considerably impoverished some habitats. Where they *are* well managed, a wonderful lush riverside border can still be found, often characterised by plants such as; Great water dock (*Rumex hydrolapathum*), Water speedwell (*Veronica anagallis-aquatica*), Hemlock water dropwort (*Oenanthe crocata*), Marsh ragwort (*Senecio aquaticus*), Water figwort (*Scrophularia auriculata*), Purple loosestrife (*Lythrum salicaria*), Yellow loosestrife (*Lysimachia vulgaris*) and Amphibious bistort (*Polygonium amphibium*) .

The private river bank is typically in the form of short grassed gardens with some structures such as offices, water treatment plants or roads.

There are many large and valuable trees along the bank including; crack and weeping Willow (*Salix x sepulcralis*), Oak (*Quercus* sp.), beech (*Fagus* sp.), and Poplar (*Populus* sp.). In both the public and private parts of the embankment these provide good quality habitats for invertebrates, birds and bats.

3.2.4 Islands

There are eleven islands within the borough river reaches, ranging from about 10m to 600 m in length. These are largely shored up by lateral sheet piling or wooden camp-shedding. During high tides and flood events parts of the islands are inundated. The islands provide an important range of inter-tidal habitats on exposed shores, shelves or bars at the foot of the sheet piling.

The islands also provide roosting habitat for water fowl, and occasionally seabirds such as the common tern (*Sterna hirundo*). However due the vertical piling at low tide, and the foxes, dogs and cats present on the larger Islands, ground nesting birds are often unsuccessful.

The lack of sites for waterfowl has seen interesting adaptations that include Coots (*Fulica atra*) nesting in trees on the little Richmond Aits (Ait being a local name for a Thames island). However it is clear, that the only consistently successful nesting sites for water birds (apart from Canada geese), are the floating man-made rafts, mooring buoys or abandoned boats that ensure that the nests survive the daily tides.

The many mature trees on the Islands, together with Ivy (*Hedera helix*) cladding, provide important roosts and nesting sites for the less common species such as Great spotted woodpeckers (*Dendrocopos major*), Tawny owls (*Strix aluco*) and Treecreepers (*Certhia familiaris.* Several bat species also depend on mature trees like broken crack willows with large trunks for roosting sites. As with much of London, Sycamore trees (*Acer pseudoplatanus*) dominate some islands; this, especially when ivy clad, provides many good roosts, nests and foraging material. Willow (Salix spp.) species dominate other islands. Barges and other moored artificial structures can also provide good nesting and roosting habitat along the river.

3.2.5 Tidal Tributaries, Flood Channels and Flood Plain

The north bank of the river, except for a short reach alongside Marble Hill House, is largely protected from inundation by a combination of the flood embankment and/or local topography. However a significant part of the south bank includes backwater and flood channels, and reaches such as Petersham Meadows and the Old Deer Park include an important range of flood plain habitats, for example the tidally flooded wet willow woodland in Petersham. These are unusual

tidal habitats within London and are considered to be of value for fish fry as well as specialised strandline invertebrates and flora.

The tidal reaches of tributary rivers such as the Crane and Beverley Brook also provide potential refuge for fish fry. They are also important access points to the Thames for wildlife using these key green corridors to the north and south of the Thames.

The flood plain areas of the Thames are inundated during periods of high water level resulting from high tides and/or higher fresh water inflows. Parts of the adjacent land are designed as storage areas for flood waters and are only inundated on spring tides. This is facilitated by large sluice pipes passing through the flood embankment to fill back-water channels. The Old Deer Park flood channel creates an exceptional wet woodland / fen, whilst the Royal Botanic Gardens, Kew ha ha provides valuable habitat heterogeneity, although it is liable to silting.

The upper reaches of the River Thames are fed with run-off from Chalk downland and Cotswold limestone and this calcareous origin is considered to have an important role in the regulation of pH over its flooded and riparian habitat corridor downstream. The raising of the pH through the calcified river water, especially in the modern acid precipitation context, is probably a contributing factor to the existence of rare molluscs (that prefer more alkaline environments for shell development), within the tidal Thames corridor such as the Two lipped door snail (*Lacinaria biplicata*) and the German hairy snail (*Perforatella rubiginosa*), that are found in several regularly flooded sites within the Borough. More research is needed, but indications are that flood prevention has for example, seen previous flood meadows in Kew Gardens developing increasingly acid soils, indicated by a progression towards calcifuge plants.

Petersham Meadows is a flood meadow, inundated typically on twice monthly spring tides or following upstream storm events. This is maintained as a meadow by grazing and provides good quality habitat for wet meadow flora.

The “Floodscape” project is currently investigating the opportunities for returning parts of Ham Lands to flood plain, as a wet meadow and/or flood plain woodland, which were artificially raised out of the flood plain by land-filling in the immediate post-war years. The main aim of the scheme is to provide additional flood storage for the Thames, and thereby reduce the flood risk to adjacent inhabited areas; however it also provides an opportunity to return a part of the historic flood plain to a more natural habitat.

3.2.6 Wildlife Corridor

One of the key aspects of the Richmond stretch of the Thames is its functional role as a wildlife corridor locally and as part of the wider Thames corridor. The stretch links the river to other important sites such as; the Kempton Park Reservoirs – a SSSI and Ramsar site, Barn Elms wetland site on the south bank, acid heathland of Richmond Park and Wimbledon Common to the south, Bushy Park and Hampton Court to the north. The corridor is an important link between the brackish and marine habitats along the Thames Estuary and the fresh water habitats of the Thames, as well as between the river Crane and Colne via the West London Green Chain. Its location as a key link along these wildlife chains, with access to a range of adjacent sites, increases its richness as an existing habitat as well as its potential if and when new habitat niches are developed.

4. Specific Factors Affecting the Habitat

4.1 Sea Level Rise and Climate Change

Sea level rise is an anticipated effect of climate change and results from the combined impact of the thermal expansion of water and the melting Polar ice sheets. The resultant effect is a sea level rise of 2 - 4 mm per year. This effect is anticipated to lead to the loss of some 10,000 hectares of foreshore and mudflat habitat in Britain over the next 20 years. In this Borough, it may further reduce the inter-tidal channel bed habitat downstream of the Richmond half Lock.

A further effect of sea level rise is the increased high tides and the consequent higher flood risk to the Borough. The Environment Agency also has made it clear that it wishes to reduce the operation of the Thames Tidal Barrier as a protective measure for the upper parts of the tidal Thames. This will increase the periods and levels of inundation within the backlands and associated flood plain habitat, and is one reason for the proposed implementation of the Floodscape project.

The latest evidence on local climate change indicates that summers in the south east of England are becoming warmer and drier whereas winters are becoming warmer and wetter. In addition the variability of the weather is increasing, resulting in increased risk of both floods and droughts. This pattern of change is already in evidence and is expected to continue with the main debate surrounding the intensity of these changes.

The broader impact of climate change on the tidal Thames habitat is difficult to gauge. Increased flooding may be a benefit to some habitats. At the same time, the loss of floodplain and channelling of the river may combine with increased flooding, to produce very rapid and turbid flow, perhaps resulting in the loss of other riparian and riverbed habitats. This loss can perhaps be ameliorated by sensitive managed retreat and flood plain enhancement schemes such as Floodscape. At the other extreme, increased droughts and lower summer fresh water inputs may result in increased stress to the existing flora and fauna, whilst promoting the incursion of estuarial visitors and exotic species.

4.2 Land Ownership and Management Responsibility

The division of ownership and responsibility for the management and maintenance of the public reaches of the tidal Thames bed, banks and backwaters is complex and divided between bodies such as the Local Authority, Port of London Authority and Environment Agency as well as public landowners such as The Royal Parks, RBG Kew, National Trust, English Heritage and others along specific reaches. This has resulted in relatively low land management efforts on these reaches, which may have been to the benefit of the associated habitats in the past, but also inhibits the delivery of potential habitat improvement measures and coherent overall habitat management.

Approximately 30% of the direct frontage to the tidal Thames is under private ownership and/or management, as are some of the islands. There is even less known about the habitat and species within much of this area, although a plan for the islands has been produced by the Thames Landscape Strategy with management proposals for many of them. It is hoped that further information and dialogue with private landowners will be encouraged through initiatives such as this HAP and other much larger local initiatives. Significant landowners in this respect include Royal Mid Surrey Golf Club and Thames Water although private householders also manage long reaches of the river frontage.

4.3 Development and Planning Controls

Any significant development proposed on either private or public land is controlled by the Local Planning Authority and will be subject to planning guidance under the council's "Unitary Development Plan" (soon to become the Local Development Framework) and the Greater London Authority's "London Plan".

The London Plan includes policy on the "Blue Ribbon Network" of land adjacent to the river. This policy supports bio-diversity and requires that "the value of waterways for wildlife and wildlife habitat will be protected and enhanced".

It is intended that this HAP and associated mapping and surveys will provide guidance to Borough planners when considering prospective developments within and adjacent to the tidal Thames area. From a habitat perspective it will be important for prospective developers to show that there will be clear net benefits to habitat and species strength and diversity from development. Given the impoverished nature of much of the riverside habitat there is the potential for beneficial net

impacts as long as enhancement measures are sensitively designed and long-term management is incorporated.

4.4 Flood Control Structures

The main flood control structures in the Borough are the system of embankments, walls and sheet piling. These retain water within the main channel, associated sluices, pipes and back channels that release water into controlled back water areas on high tides, and let it back into the main channel on low tides.

This system is primarily for the purposes of flood management, although it results in back waters, flood meadow and wet woodland habitat. However there is be scope for reviewing the operation of this system, and the management of the associated flood plain, to better manage the existing habitat and/or provide additional good quality habitat within the backland area.

These features also result in a constrained river channel, increased flow velocity and water depth and a combination of pools and glides but no riffle sequences within the river. As a consequence, there are no locations where the river is in turbulent flow downstream of Teddington Lock. This controls the distribution of oxygen within the river channel, which is consequently high immediately downstream of Teddington Lock but subject to reductions further downstream.

4.5 Flood Plain Management

As noted above, the management of the flood plain is closely linked to the design and operation of the flood structures, which control the amount and timing of water released into the flood plain area. The management of the flood plain itself is dependent upon the topography and the approach to managing the ground flora.

The Old Deer Park for example is managed for recreation as a sports field and consists of close mown grass, which, despite being inundated several times per year, has little habitat interest. Petersham Meadows is managed as open wet meadow by the introduction of cattle during the summer to maintain grass levels and control succession plants. This is an interesting habitat for flora and associated species, which is rare within London. The wet woodland adjacent to Royal Mid Surrey Golf Club appears to be essentially un-managed and has progressed over many years to a mature wet woodland habitat, which is also rare within London.

4.6 Barriers and Locks

The Thames Barrier lies downstream of central London and well outside the Borough, but it has a vital role to play in the protection of the Borough from flooding. It is likely that, in the future, more use will be made of local schemes such as Floodscape and less reliance placed on the Barrier. Other opportunities to develop wetland habitat as part of local flood management are possible if Floodscape is successful.

Richmond Half Lock retains artificially high water levels for the lower half of the tidal cycle. This results in still water conditions for half the tidal cycle and reduced inter-tidal habitat exposure. This lock may have an impact on sediment movement but is unlikely to significantly impede fish migration as it is breached twice daily.

Teddington Lock is actually a major weir structure with an associated lock for the movement of river transport. The impact of this structure on the migration of fish is not known at present.

4.7 Water Quality

Whilst it is generally acknowledged there has been a major improvement in background water quality in the tidal Thames over the last forty years, a detailed analysis of the base data has not been undertaken. There is a constant high input of nutrients with resulting high biochemical oxygen demand (BOD) from the major treated effluent of Mogden Works - discharged to the Thames at Isleworth Ait; this deposits anoxic sediments to the local river reaches and has a detrimental impact on local river species. The river has no significant natural inputs of dissolved oxygen downstream of Teddington Lock and this makes it susceptible to oxygen sags in response to low flows, high temperatures and effluent inputs. There is relatively constant BOD loading from

Mogden and other licensed discharges; in addition there are peaks caused by the periodic discharge of dilute but untreated effluent and associated solid detritus from combined sewer overflows.

The fishery is particularly vulnerable to the operation of combined sewer overflows following summer storms, when the conditions combine and major oxygen sags can result leading to high fish kills. It is likely however that the cumulative effect of the 50 to 60 combined sewer discharges on an average year has a larger underlying impact on ecology and habitat.

4.8 Litter

Plastic bags and plastic sheeting are common in the tidal Thames and often get lodged in trees where they look unsightly. Willow trees perform a useful 'raking' operation, preventing the passage of plastic to the sea and estuary. It is in the sea where research has shown they can be lethal to marine animals. Underwater, they 'open-up' and are mistaken as jellyfish and other prey items by marine turtles, for example. Leatherback turtles (*Dermochelys coriacea)* are recorded in the Thames Estuary. In 2002 the Marine Conservation society found that a dead Minke whale in Normandy, France, contained nearly 1 kg of plastic bags and packaging. Identifiable were English supermarket plastic bags. The National Aquatic Litter Group (NALG) is working to reduce litter from rivers.

4.9 Water Quantity

Abstraction of fresh water for public water supply, combined with the effects of climate change, has resulted in extended periods, particularly in the summer, of low fresh water inflows to the tidal reaches of the river. This reduces the oxygen content in the river as well as promoting increased saline intrusion and potential changes to the habitat.

4.10 River Transport and Recreation

The commercial traffic along the river is minor but there is significant recreational traffic by motorised and un-powered craft. Large washes resulting from certain motorised boats can have a significant impact on the river habitat and shoreline erosion. The combination of bank erosion by mitten crabs (see below) and large rolling washes, can be observed as accelerating the erosion. This is exemplified by the shoreline zone of the SSSI of Syon House, where the condition of the habitat is described as 'unfavourable' as a result.

The river is vulnerable to dredging activities due to the high quality shellfish habitat and its sensitivity to dredging and associated sediment movements. Any organisation proposing to dredge within or local to the Borough should first seek clarification as to the likely impact upon these and other habitats. There has also been concern expressed regarding the potential impact of dredging down-stream, particularly if tidal conditions result in an influx of sediment rich water into this part of the river.

The river is well used by walkers and cyclists along the banks and whilst these uses are largely benign, there is a problem with refuse in the river and its impact upon larger animals, such as seals, turtles and dolphins, within the downstream reaches. There is some recreational fishing within the reach but no commercial fishery.

4.11 Problem Species

The Chinese mitten crab is recognised as a problem species in the tidal Thames, largely as a result of its habit of burrowing into marginal banks. Given the lack of suitable habitat in this Borough it may be less of a problem at present but remains an issue if this habitat is re-introduced to the Borough.

Japanese knotweed (*Polygonum cuspidatum*) is a major problem species in the marginal habitat adjacent to the river. Himalayan Balsam (*Impatiens glandulifera*) is also found extensively on river embankments and flood plain of the Borough and can result in mono-cultural habitat with little floral species diversity.

4.12 Lack of Knowledge

One of the main issues in the tidal Thames is the fragmentation of responsibilities for the river and no central repository for knowledge regarding the habitats and species present. There is considerable potential for improvements in river and river-side management for the benefit of habitat and species diversity. This fragmentation of responsibility and consequent lack of knowledge is a major hindrance to the development of improved management for the system.

5. Current Action

5.1 Legal Status

The tidal Thames within London is not covered by any statutory nature conservation designation. It is however recognised by the GLA as a "Site of Metropolitan Importance for Nature Conservation". This non-statutory designation nonetheless is a valuable protection at GLA and local level in planning terms.

There are a number of other sites adjacent to the river with Metropolitan status including Barn Elms Reservoirs, Bushy Park and Home Park, Ham Lands, and Stain Hill and Sunnyside Reservoirs. Further sites designated as having Borough Importance include the Old Deer Park, Royal Botanical Gardens, Lonsdale Road Reservoir, Petersham Meadows and Petersham Lodge Wood.

5.2 Mechanisms Targeting the Habitat

Although, or maybe because, there is no overall authority for the tidal Thames, there are many initiatives at both a local and a regional level which either directly or indirectly impact upon the habitat.

5.2.1 Thames Estuary Partnership

This partnership was set up, in the absence of a single management body, to provide a focus for the management of the tidal Thames. Although the formal upstream limit of interest is Tower Bridge, in practice its interests extend from the Essex and Kent Marshes to the uppermost reaches within Richmond Borough.

The partnership is the lead body for the tidal Thames HAP for the Greater London area and in 2004 produced the tidal Thames Habitat and Species Audit. TEP is currently starting a major survey of the key habitats and species along the tidal Thames and also proposes an ambitious programme of research activities for the tidal Thames.

5.2.2 Thames Landscape Strategy Hampton to Kew

The "Thames Landscape Strategy" was established in 1994 for the Thames corridor between Hampton and Kew and the Borough is one of the key partners. The Strategy is ongoing, working with local groups and communities to develop management and regeneration schemes for the Thames landscape and supports funding activities for these plans. 'London's Arcadia' is one of the main schemes and has recently received £3.3m of Heritage Lottery funding for the riverside area between Twickenham and Richmond Lock.

5.2.3 Thames Strategy Kew to Chelsea

The "Thames Strategy Kew to Chelsea" was launched in June 2002 and sets out a vision for the management of the river and its corridor downstream of Kew Bridge to Chelsea. A full time project manager is in place to realise the objectives of this strategy.

5.2.4 Floodscape

The "Floodscape" project is investigating the potential for returning some or all of Ham Lands into floodplain by lowering ground levels and thereby providing an improved capacity for flood management of the surrounding urban river-side areas. There is the potential to develop managed flood plain habitats as part of the scheme although it will also result in the loss of some woodland habitat.

5.2.5 Thames Tideway Strategic Study

The Thames Tideway Strategic Study is a collaborative study, managed by Thames Water, investigating options for improving the current problem of discharges from combined sewer overflows. The final report, published in February 2005, identifies a long-term solution by the

construction of a major interceptor sewer beneath the river between Hammersmith and Crossness Sewage Works downstream. This scheme is not scheduled for completion until 2020 and does not directly address the local problems resulting from Mogden and other local CSOs, which are all upstream of the proposed tunnel.
Thames Water has proposed interim measures to reduce problems in the mean time and also intends to implement local solutions for Mogden. The details of these schemes have not been viewed to date.

5.2.6 Planning Controls

Planning developments are controlled by the Borough UDP, to be superceded by the Local Development Framework, and the London Plan. The London Plan incorporates specific provision for protection and enhancement of the bio-diversity within the "Blue Ribbon Network" of land adjacent to the river.

5.2.7 Environment Trust Towpath Group

This group has produced a detailed audit of the south bank of the river between Kew Bridge and Beverley Brook. A schedule of physical improvements and proposals for improved management for the benefit of biodiversity and river-side users are due to follow from this audit.

5.2.8 Volunteer Groups

There are a large number of volunteer groups carrying out clean up and improvement works along the length of the river within the Borough. Co-ordination of these activities is carried out by many of the organisations above and is increasingly being co-ordinated and supported by the Richmond Environment Network, recently set up and funded by the Council through Richmond CVS.

6. Flagship Species

These special plants and animals are characteristic of the tidal Thames in LB Richmond; many are also listed in the London Plan or the UK Plan.

Common Tern	*Sterna hirundo*	Summer visitor, breeds on derelict structures and islands
Grey Heron	*Ardea cinerea*	Particularly associated with the islands and back waters
Purple Loosestrife	*Lythrum salicaria*	A wetland plant characteristic of river banks particularly important for bumblebees.
Two Lipped Door Snail	*Lacinaria biplicata*	A spire shelled mollusc. Its habitat is soil surface (usually with ivy cover) of occasionally flooded riparian land in the shade of closed canopy woodland.
German Hairy Snail	*Perforatella rubiginosa*	A small mollusc with small bristles. Confined to the tidal Thames in the UK, it inhabits strandline detritus in the shade of closed canopy woodland and riparian vegetation.
Flounder	*Platichthys flesus*	A sea fish which spends its juvenile months in the tidal Thames, which provides a refuge area for fry spawned in the North Sea.
Great crested Grebe	*Podiceps cristatus*	A crested diving bird feeding on fish. Once almost extinct in UK, several pairs are breeding in the Borough, dependent on man made rafts.
Depressed River Mussel	*Pseudanodonta complanata*	A jade green bivalve freshwater riverbed mussel found in the upper reaches of the tidal Thames. A UK BAP Priority species.
Daubenton Bat	*(Myotis daubentonii)*	Medium sized bronzy coloured furry bat. Often called the 'water bat' as it feeds on insects over smooth water.

Salmon	*Salmo salar*	Salmon were re-introduced in the 1980's and up to 500 fish now pass through on their way from the sea to upstream spawning areas.

7. Objectives, Actions and Targets

Most of these actions are specific to this habitat. Please note that the partners identified in the tables do not represent an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: Establish a Working Group to move forward with the Plan Objectives over the period 2005 to 2010.
Target: Working Group established by end of 2005

Action	Target Date	Lead	Other Partners
1.1 Send copies of the Plan to all interested parties and request feedback	2005	RBG	
1.2 Identify and contact potential interested parties for the Working Group	2005	RBG	
1.3 Form the Working Group, agree a method of working and identify partners	2005	TT HAP Working Group	Interested parties

Objective 2: Produce a database and associated plan of habitats and species within the tidal Thames of Richmond Borough.
Target: Initial database and plan completed for inclusion in the TEP Survey by 2006

Action	Target Date	Lead	Other Partners
2.1 Review the approach to the Survey with TEP and identify opportunities for collaborative working	2005	Working Group	TEP
2.2 Undertake a survey of the river bed, including during the annual Richmond Half Lock draw-off.	2005	Working Group	TEP, ETRuT
2.3 Collate existing data from regulators and other interested parties and develop an initial database	2006	Working Group	TEP, EA, LWT
2.4 Support other survey work by TEP and other parties and add the data to the database	2007	TEP	Working Group, Floodscape, EA, LWT, LA

Objective 3: To make available the biodiversity records for the tidal Thames corridor within the Borough, with the aim of facilitating the protection of species through contractors, agencies and Council Planning being made aware of species locations and sensitivities; aiding research; and facilitating life-long learning.
Target: To put a database in place by 2007

Action	Target Date	Lead	Other Partners
3.1 To provide, for council use only online locations of vulnerable habitat and species	2007	Working Group;	EA; LWT; TEP; TLS;

		RBG Kew; LA	
3.2 Provide a generally available online database with interactive maps for species checklists, habitats and distribution	2007	Working Group, RBG Kew	EA

Objective 4: Review existing activities in the tidal Thames and provide advice and information to support the incorporation and development of aspects that promote biodiversity
Target: Review existing activities by 2006; ongoing development and implementation

Action	Target Date	Lead	Other Partners
4.1 Review works to date and proposals with the Thames Landscape Strategy and Thames Strategy: Kew to Chelsea and identify opportunities for habitat enhancement works and management schemes	2006 and ongoing	TLS, TSK2C, Working Group	LA
4.2 Review proposals under the Thames Tideway Study and make representations for means to reduce the impact of CSOs on the tidal Thames in the short to medium term	2006 and ongoing	TTS team, Working Group	LA
2.3 Provide inputs to the Floodscape Strategy as it develops on management opportunities to promote bio-diversity	2006 and ongoing	Floodscape team, Working Group	LA
4.4 Support other initiatives on the tidal Thames, including ETRuT Towpath Group for example.	2006 & ongoing	ETRuT, Working Group	REN, LA, EA
4.5 Promote integrated habitat enhancement in private waterside gardens	2007 & ongoing	LA Working Group, private landowners	EA

Objective 5: Review the coverage and level of existing Site Designations with a view to ensuring all sites are adequately protected in the light of findings on species presence and habitat value
Target: Identify Sites that may justify increased protection and submit proposals by 2008

Action	Target Date	Lead	Other Partners
5.1 Compare the evolving database and associated plan of tidal Thames Habitats and Species to the existing coverage and level of Designated Sites and identify where Designations may be reasonably added or revised	2007	Working Group	LA, LWT, TEP
5.2 Develop a case for revision to the Designations and submit this to the relevant authorities	2009	Working Group	LA, LWT, GLA, DEFRA

Objective 6: Provide inputs to the development of the Local Development Framework for Richmond Borough to ensure the tidal Thames is appropriately protected under the plan
Target: Appropriate protections included in the LDF on publication in 2007

Action	Target Date	Lead	Other Partners
6.1 Submission of proposals as part of the development and drafting process	2006	Working Group, LA	TEP, LWT
6.2 Work with the Council on the final version	2007	Working Group, LA	

Objective 7: Identify sites for potential river-side habitat improvement and work with the appropriate bodies to bring these to fruition.
Target: Completion of improved habitat sites by 2009

Action	Target Date	Lead	Other Partners
7.1 Identify riverside areas for habitat improvement, in line with the aesthetic and biodiversity objectives of TLS and RBG Kew (riparian buffer zone management plan) and other stakeholders.	2007	TLS, RBG Kew,	EA, LWT, TRP, Working Group
7.2 Develop habitats next to sheet piling and impoverished banks, including the creation of semi-aquatic and riparian vegetation swathes.	2009	TLS, RBG Kew	EA, Working Group

Objective 8: Reduce the amount of rubbish entering the river within the Borough
Target: Bins with lids installed and trees cleaned of bags regularly by 2007

Action	Target Date	Lead	Other Partners
8.1 Identify litter sources and sites. Protect or supply bins with lids, to prevent raiding by foxes and crows	2007	TLS, TSK2C, LBRUT	EA, LWT, RBG Kew Supermarkets, Working Group
8.2 Remove plastic and rubbish caught in trees. Start education campaign on wide reaching effect of river litter on marine animals	2007	LBRUT, TLS Canoe and sailing clubs	NALG EA, supermarkets, Working Group

Objective 9: Provide increased nesting sites for breeding waterfowl
Target: Put in place several nesting rafts for water fowl and terns

Action	Target Date	Lead	Other Partners
9.1 Identify potential sites and designs for nesting rafts	2007	TLS, PLA, Working Group	EA, LWT, RBG Kew, LA
9.2 Put in place, suitable natural looking rafts on permanent protected moorings.	2008	TLS	EA, LWT, PLA, LA

Objective 10: Broadcast the value of the tidal Thames and the objectives of the tidal Thames to the general public and other interested parties
Target: Incorporate elements of the TT HAP into existing and emerging life long learning programmes in partnership with TLS, TSK2C and other interested parties

Action	Target Date	Lead	Other Partners
10.1 Develop life long learning initiatives on the TTHAP for inclusion in the project work of the TLS and TS K-C	2005	TLS TSK2C Working Group	LA EA RTBP
10.2 To incorporate appropriate aspects of the TTHAP into TLS walking leaflets and 'Arcadia' HLF project work	2006	TLS	

Relevant Action Plans

Local Plans
Reedbeds, Bats

London Plans
Tidal Thames, Grazing Marsh and Floodplain Grassland, Reedbed, Grey Heron

National Plans
Mudflats, Sub-littoral Sands and Gravel, Twaite shad, Salmon, Depressed river mussel

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Abbreviations

BAP – Biodiversity Action Plan
BOD – Biochemical Oxygen Demand
CSO – Combined Sewer Overflow
CVS – Council for Voluntary Services
DEFRA – Department of Environment, Food and Rural Affairs
EA – Environment Agency
ETRuT – Environment Trust for Richmond upon Thames
GLA – Greater London Authority
HAP – Habitat Action Plan
PLA – Port of London Authority
RBG – Richmond Biodiversity Group
RBG Kew – Royal Botanic Gardens Kew
REN – Richmond Environment Network
SSSI – Site of Special Scientific Interest
TEP – Thames Estuary Partnership
TSK2C – Thames Strategy Kew to Chelsea
TLS - Thames Landscape Strategy (Kew to Hampton)
TRP – The Royal Parks

LA – Local Authority (London Borough of Richmond upon Thames)
LWT – London Wildlife Trust
NALG - National Aquatic Litter Group
TT HAP Working Group – Tidal Thames Habitat Action Plan Working Group
UDP – Unitary Development Plan

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SPECIES ACTION PLANS

- Bats
- Mistletoe
- Song thrush
- Stag beetles
- Tower Mustard
- Water Vole

Richmond upon Thames
Species Action Plan
Bats

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1. Aims

- To reverse the current population declines of bats in London Borough of Richmond upon Thames
- To redress public misconceptions about bats and secure their status as culturally valued species.

2. Introduction

Bats are highly adapted nocturnal mammals – the only mammals to have evolved powered flight. Often thought of as flying mice, they are in fact more closely related to humans than to rodents, and form a special group of their own: the *Chiroptera*, meaning 'hand-wing'. Bats are generally only seen briefly at dusk and their seemingly furtive nocturnal habits have, over generations, resulted in popular misconceptions and even a misplaced fear of them. Modern horror stories, films and the media quoting fiction as fact have not helped to improve this tainted public image.

British bats only eat insects. Serving as natural insecticides, they consume huge numbers and variety of prey – a single pipistrelle can eat 3000 midges in a night. With the loss of natural roost sites in trees and woodlands, many bats have adapted to living in buildings. Some favoured householders may therefore be surprised to discover these unexpected lodgers for a short period during the summer, when female bats need somewhere warm to raise their young. Their reliance on buildings for roosting greatly focuses conservation efforts on people's tolerance and goodwill. Bats are an excellent indicator of the quality of our environment, as their complex ecological requirements leave them highly sensitive to environmental changes. Their serious decline should be of major concern to us all.

All of the Borough's bat species are dealt with collectively in this plan because:

- Those currently concerned with the conservation of bats deal with all species;
- All bat species and their roosts are equally protected by law;
- The conservation problems faced by all bats are believed to be generally similar, so measures proposed here are likely to be of benefit to a number of species.

3. Current Status

At least six bat species are known to breed in Richmond-upon-Thames. The two pipistrelles (Common and Soprano) are by far the most widespread, while the Noctule, Brown long-eared bat and Daubenton's bat are more localised but regularly recorded. Much rarer species include the Serotine, Nathusius' pipistrelle and Leisler's and Natterer's bats. Important sites in the Borough for bats include the London Wetland Centre in Barnes, the River Crane valley, Richmond and Bushy Parks, Stain Hill reservoirs, as well as various sites within the River Thames corridor, such as Petersham Lodge Woods and Lonsdale Road reservoir.

Worryingly, a repeat survey undertaken in 1999 found that there has been a significant decline in Greater London's bat populations since the mid-1980s, particularly for the Noctule and the Serotine (Guest *et al*., 2000). Some of the probable causes of this are summarised below.

4. Specific Factors Affecting the Species

4.1 Loss of maternity roost sites in buildings or trees

Destruction of, disturbance or damage to vulnerable maternity roosts can result from entrenched attitudes towards maintenance and management, a lack of public awareness and understanding of bats, as well as continued ignorance of the legislation protecting them.

4.2 Loss of and disturbance to other roost sites

Hibernation and other seasonal roost sites can be disturbed or damaged for the same reasons as above. These sites include buildings (mainly their roof spaces), trees, bridges and various underground structures, such as cellars, and disused tunnels.

4.3 Loss of feeding habitats

Changes in land use (including development) can result in the loss of insect-rich feeding habitats such as wetlands, woodlands and grasslands.

4.4 Disturbance to commuting routes

Flight paths to and from feeding areas and roosts may be disturbed through the loss of flight line features such as green corridors, or through introduction of new features such as artificial lighting.

5. Current Action

5.1 Legal status

All species of bat are protected in the UK through their inclusion on Schedule 5 of the *Wildlife and Countryside Act*, 1981 (as amended by the *Countryside and Rights of Way Act*, 2000), and on Schedule 2 of the *Conservation (Natural Habitats & c.) Regulations*, 1994. The latter further implements European legislation protecting bats. Bats are also protected from cruel ill-treatment by the Wild Mammals (Protection) Act, 1996.

The UK is a signatory to the *Agreement on the Conservation of Bats in Europe* which came into force in 1994, set up through the *Bonn Convention on the Conservation of Migratory Species of Wild Animals*, 1979. While this is not strictly a legal instrument, as a signatory the UK is obliged to abide by such agreements.

5.2 Mechanisms targeting the species

5.2.1 Bat wardens

The London Bat Group co-ordinates a network of licensed bat wardens, working in liaison with English Nature to safeguard bat roosts (particularly those in houses), that may be under threat. Participants are active within the London Borough of Richmond.

5.2.2 Awareness-raising

The place of bats in London life is promoted regionally and locally by organisations such as the London Bat Group, London Wildlife Trust, the Wildfowl and Wetlands Trust at Barnes, The Royal Parks and the Borough Council through a programme of guided walks, illustrated talks, training and articles. The Bat Conservation Trust, English Nature and the London Bat Group have

produced various publications, including a series of specifically targeted leaflets aimed at promoting best practice in relation to bats within the building, pest control and arboricultural professions.

5.2.3 Survey and Research

London Bat Group volunteers based within the Borough participate in national and local surveys and research, including the Bat Conservation Trust's National Bat Monitoring Programme.

6. Objectives, Actions and Targets

Please note that the partners identified in the tables are those that could be involved in the process of implementing the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions - but are not necessarily implementers.

Objective 1: To raise awareness among key audiences, specifically planners, land managers and tree contractors
Target: Disseminate best practice advice by 2006

Action	Target Date	Lead	Other Partners
1.1 Promote best practice to all major tree surgery contractors using BCT's 'Bats In Trees' & other appropriate publications	2005	LA	BCT, LTOA, LBG
1.2 Maximise the roosting opportunities for prospecting bats by encouraging land managers and property owners to follow good practice guidelines	Ongoing	LA	LBG, TRP, BTCV, TW, Network Rail
1.3 Encourage appropriate foraging habitat management for bats across the Borough, for example by increasing grant scheme applications	Ongoing	LA	LBG, DEFRA, FC, TRP
1.4 Distribute and promote a Bat Advice Note to all Borough planners (Forward & Development Control) & key developers	2006	LA	BCT, GLA, EN, GLA, WLO
1.5 Distribute appropriate information to major roofing contractors & pest control companies	2005	LA	EN, LBG, BCT, Trade Associations

Objective 2: To increase knowledge of bat distribution and population change
Target: Monitoring programme implemented by 2006

Action	Target Date	Lead	Other Partners
2.1 Maintain Borough participation in NBMP	Ongoing	BCT	LBG
2.2 Recruit and train 3 further surveyors for NBMP	2007	LBG	BCT
2.4 Contribute to database of records for all bats in London	Ongoing	LBG	GIGL, WWT, TRP, LNHS

Objective 3: To protect and create new artificial roost sites in association with suitable feeding habitat
Target: Establish 8 new roosting opportunities by 2007

Action	Target Date	Lead	Other Partners
3.1 Identify potential sites for roost creation opportunities	2005	LA	GLA, LBG
3.2 Create new roost opportunities on 8 identified sites	2007	LBG	LBR, WWT, BTCV, EA, Arcadia, TW, LWT, TRP, RYOT, Network Rail

Objective 4: To increase public awareness and participation in bat conservation
Target: Encourage 30 Borough residents to become active members of London Bat Group by 2008

Action	Target Date	Lead	Other Partners
4.1 Maintain co-ordinated programme of guided bat walks, attracting a total of at least 250 people per annum	Annually	LBG	LA, BCT, LWT, WWT, TRP
4.2 Maintain programme of event attendance, illustrated talks and popular written articles in local press	Annually	LA	LBG, LWT, WWT, Local Media
4.3 Run training courses in use of bat detectors	Biennially	WWT	LBG, BCT
4.4 Run training courses for potential leaders of bat walks	Biennially	LBG	LA

Relevant Action Plans

Local Plans

River Thames; Ancient Parkland/Veteran trees; Reedbeds; Broadleaved Woodland

London Plans
Woodland; The Tidal Thames; Private Gardens; Rivers & Streams; Reedbeds; Churchyards and Cemeteries; Parks, Amenity Grasslands and City Squares; Open Landscapes with Ancient/Old trees Audit.

National Plans
Built Environment and Gardens; Pipistrelle bat.

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Abbreviations

BCT - Bat Conservation Trust
BTCV - British Trust for Conservation Volunteers
EN - English Nature
GIGL - Greenspace Information for Greater London
GLA - Greater London Authority
LA - Local Authority (London Borough of Richmond upon Thames)
LBG - London Bat Group
LBP – London Biodiversity Partnership
LNHS - London Natural History Society
LTOA - London Tree Officers Association
LWT - London Wildlife Trust
NBMP - National Bat Monitoring Programme
RYOT – Richmond Youth Offending Team
TRP – The Royal Parks
TW - Thames Water
WLO - Wildlife Liaison Officer (Metropolitan Police)
WWT - Wildfowl and Wetlands Trust

Contact
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Richmond upon Thames
Species Action Plan
Mistletoe: Viscum album (platyspermum)

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1. Aims

- To promote the conservation and spread of mistletoe within the London Borough of Richmond upon Thames.
- To increase awareness of the special status of mistletoe in the borough.
- To encourage interest in the conservation of mistletoe amongst residents of the borough.
- To monitor the existence and spread of mistletoe in the borough.
- To co-operate with other biodiversity groups within the borough, and with complementary groups of the Greater London Authority.

2. Introduction

Our native mistletoe has the Latin name *Viscum album*, which refers to the sticky (viscous) white (e.g. albino) berries. The berries ripen in the late autumn in pairs in the V-shaped crotch between mistletoe shoots. *V.album* is only partly parasitic on the deciduous host tree because its dark green leaves allow the mistletoe to photosynthesise like its host and other plants. Mistletoe therefore takes only fluids and support from the host. It is a "hemi-parasite", causing little if any harm.

For centuries mistletoe has been seen as a mysterious, even magical, plant. There are many stories about, for instance those dating back to the herbalist Culpeper in 1652. The earliest account is from the Roman Pliny, writing in 77AD. He described how the Druids specially prized mistletoe taken from oak trees.

In reality mistletoe grows best in open landscapes like gardens, streets and parklands; and seldom on oaks. In Bushy Park and Home Park, beside Hampton Court Palace, are some of the best growths of mistletoe to be seen anywhere in London: Richmond is fortunate.

It is appropriate that mistletoe is the subject of a Species Action Plan, within the Biodiversity Action Plan for the London Borough of Richmond upon Thames. It is much less common elsewhere in London as a whole. We have both the opportunity and the responsibility to care for our mistletoe and, if possible, to distribute it more widely.

3. Current Status

You can see mistletoe in Richmond borough easily. It grows profusely in Bushy Park. Walking along the great Chestnut Avenue, look at the upper branches of the hybrid lime trees in the outer lines of trees. There you will see the typical dark green spherical growths of mistletoe. They are abundant where a side road leads west following the line of "Cobblers Walk". About a third, 70, of

the limes in the great avenue are hosts to mistletoe. About 150 of the hawthorns, that give Bushy its name, also have good growths.

Within Home Park, the great hunting park of Henry VIII, there are large growths high up on the old hybrid limes in the avenues running from Hampton Court Palace north east towards Kingston Church and south east towards Thames Ditton. Some of the exotic trees near the palace also support mistletoe. More typically, there are mistletoe growths on various apple (*Malus sp.)* and lime (*Tilia vulgaris*), and abundantly on a fine false acacia (*Robinia pseudacacia*) beside Barge Walk at the west front of the Palace. The most remarkable mistletoe near the Palace is on the crescent avenue beside the canal in the east front garden. The avenue was replanted with 200 hybrid lime trees in 1987: already a third of them are carrying mistletoe growths.
Just walking the streets of Richmond, mistletoe can often be seen. Favoured hosts for mistletoe are species of lime (*Tilia*), hawthorn (*Crataegus*), apple (*Malus*) and poplar (*Populus*). Mistletoe is extremely rare on oak (*Quercus*). That is why Richmond Park with its old oak trees has only one growth, which is on a lime near Petersham gate.

4. Specific Factors Affecting the Species

4.1 Vectors

Mistletoe seems to prefer open man-made landscapes like parks, gardens and roadsides. There is no certain explanation for this. Perhaps it is to do with the feeding and roosting habits of the vectors of mistletoe; that is birds. When eating the berries their sticky pulp (viscum) sticks to birds' beaks. The birds scrape it off, leaving pulp and seed to germinate on a new tree. Alternatively, the seed comes out partly digested the other way. The mistle thrush (*Turdus viscivorous*) is the best known carrier of mistletoe, and it can be seen high up near the growths, perhaps guarding the crop of berries for itself. It is a defecating vector: "Turdus". Other birds in that family presumably eat the berries too. The blackcap (*Sylvia atricapilla*) is a beak wiping vector. Possibly those bird species are decreasing nationally. If that trend is occurring locally there is a danger that the natural spreading of mistletoe will also decrease.
The small flowers that occur early in the year, about February, are pollinated by insects – usually small flies – and possibly partly by wind. The bright yellow of the flowers is spectacular – perhaps the "Golden Bough" of antiquity. Low accessible growths are at risk of being illegally gathered.

4.2 Pests

Six insects are known to attack mistletoe in England: one moth, four bugs and a weevil. The Royal Parks has published a helpful leaflet on the subject, based on information published by Buglife. Because of the difficulty and the lack of surveys of mistletoe pests, it may be that more pests will be identified in the future. It is not known whether, if at all, these pests endanger mistletoe.

4.3 Management practice

Existing forestry and management practice in boroughs, parks authorities etc. may be unsympathetic – for example, being a tree parasite, the species is sometimes pruned out. Also, because much mistletoe grows in man-made habitats frequented by the public, responsible authorities feel obliged to trim or even fell the older branches or trees on which mistletoe has become established. Besides removing the existing growth, this reduces the food stock of berries for potential growth through the distribution by birds. That could cause a vicious cycle of decline.
There is neglect of some mistletoe colonies and possibly a loss of management techniques. For example, traditional "sustainable" harvesting, which controlled infestations whilst allowing their survival, may no longer be practised. However this would typically apply to apple orchards and therefore not be a problem in Richmond.

4.4 Omission from habitat creation schemes

Mistletoe is often omitted from otherwise suitable habitat creation schemes. Examples include Community Orchard and allotment schemes, which often fail to include mistletoe planting.

5. Current Action

5.1 Legal Status

Mistletoe receives the same protection as all other wild plants in the UK through the Wildlife and Countryside Act (1981, as amended). Therefore, it may not be uprooted (which would include pulling down whole plants) without the permission of the landowner. The felling of host trees may be prevented by Tree Preservation Orders.

5.2 Surveys

The national mistletoe survey (Briggs, 1999) raised the plant's profile significantly and gave rise to much public interest. This survey still continues informally. Detailed local surveys have been made in Bushy and Home Parks in 1995, partly up-dated in Home Park in 2004. Those map the location and host species of all mistletoe growths.

5.3 Habitat management

Various campaigns promoting conservation of traditional orchards (e.g. Common Ground's projects) and the conservation of parkland and veteran trees may be indirectly helping mistletoe. The London Biodiversity Partnership has an Action Plan for mistletoe, which is encouraging the conservation and spread of the species.

6. Objectives, Actions and Targets

The following list of objectives, targets and actions are proposals. They will be changed as work proceeds. Please note that the partners identified in the tables are those that could be involved in the process of implementing the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions - but are not necessarily implementers.

Objective 1: Co-operate with major landowners/managers to record and conserve Richmond's mistletoe.
Target: Identify main sites of mistletoe within the borough. Plan to monitor its growth.

Action	Target Date	Lead	Other Partners
1.1 Alert principal organisations within the borough to the importance of conserving existing mistletoe; record areas of growth.	Mostly done 2004. Locate others 2005	M'toe group	GIGL
1.2 Identify sites where the growth of mistletoe can be readily and regularly monitored.	2005	M'toe group	HRP, RBGK, LBP, TRP
1.3 Survey identified sites and publish results.	2006	M'toe group	ECSS, FoBHP, LBP

Objective 2: Generate an appreciation of Richmond's special mistletoe to the general public in the borough and to specialists.
Target: Promote a series of awareness raising activities in London Borough of Richmond upon Thames

Action	Target Date	Lead	Other Partners
2.1 Make plans to publicise the importance of our mistletoe to local residents; identifying different audiences and media.	2005	M'toe group	LA press office and schools
2.2 Consider using existing or making new publications to promote mistletoe.	2005	LA	M'toe group
2.3 Devise talks, walks and/or other means to involve local residents more directly in conservation of mistletoe.	Ongoing	M'toe group	HRP, ECSS, FoBHP, TRP, U3A
2.4 Identify roles suitable for local volunteers.	2006	M'toe group	BP volunteers, HRP, HHC

Objective 3: Establish mistletoe at suitable new sites in the London Borough of Richmond upon Thames.
Target: Propagate the species in suitable sites and record success.

Action	Target Date	Lead	Other Partners
3.1 Select sites suitable for the introduction of mistletoe, and if possible for subsequent monitoring.	2005	M'toe group	Other RuT groups, RBGK, Site owners & managers
3.2 Get berries and introduce mistletoe to these sites.	2006	M'toe group	HRP, TRP as sources, & Site owners & managers

Relevant Action Plans

Local Plans
Broadleaved woodland, Ancient parkland and veteran trees, Song thrush, Urban churchyards, cemeteries etc.

London Plans
Woodland; Private Gardens; Wasteland; Churchyards and Cemeteries; Parks, Amenity Grassland and City Squares; Black Poplar; Hedgerows Statement; Railway Linesides Audit; Open Landscapes with Ancient/Old Trees Audit; Ponds, Lakes and Reservoirs Audit.

National Plans
Lowland Wood Pasture and Parkland; Built-up areas and Gardens

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Abbreviations:
BP – Bushy Park
ECCS – Ecology and Conservation Studies Society
FoBHP – Friends of Bushy & Home parks
GIGL – Greenspace Information for Greater London
HHC – Hampton Horticultural Club
HRP – Historic Royal Palaces
LA – Local Authority (London Borough of Richmond upon Thames)
LBP – London Biodiversity Partnership
TRP – The Royal Parks
U3A – University of the Third Age

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Richmond upon Thames
Species Action Plan
Song Thrush

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"From one-two decades ago it was possible to listen to half a dozen thrushes, now it is rare to hear more than one. The tendency… has been towards a greater artificiality, it saves for trouble and makes for prettiness to cut down decaying trees. To drape them in ivy and make them beautiful in decay would take some thought and care."
(W.H. Hudson on West London Song Thrushes, Birds in London, Dent & Sons, 1928)

1. Aims

- The overall aim of this action plan is to prevent further decline of the song thrush in Richmond Borough and to contribute to an overall strengthening of the population of song thrush throughout London.

2. Introduction

The song thrush is a common and widespread species throughout the United Kingdom. Both sexes are alike, with adult birds having warm brown back and upper parts and distinctive blackish-brown spots on the yellowish-white lower throat and breast. At around 20-23cms the song thrush is the second smallest of the six thrush species regularly occurring in the U.K. and the smallest of the three resident species. In Richmond Borough it is only likely to be confused with the significantly larger mistle thrush and, in the winter, with the slimmer redwing.

The song thrush has a most distinctive loud and proclaiming song, which has endeared it to generations. This is heard throughout the day but most regularly before dawn and after sunset. The clearly uttered lively phrases and repetitions make the song thrush one of the most beautiful of our native songbirds. Breeding territories (typically around 0.2 – 2.6 hectares) are often established in late winter, making the song thrush one of the first birds to herald the approach of spring. In mid-January the suburban dawn chorus is often dominated by the calls of this species.

Song thrushes can potentially be found in any habitat where there is a mixture of woodland, bushes and hedgerows, a preference that often brings this species into parks, allotments and gardens. Song thrushes nest low down in any suitable cover, but typically in shrubs, amongst creepers on walls or on the ground amongst thick vegetation. Song thrushes feed primarily on worms, slugs, snails and fruit.

The song thrush may be either a resident, a partial migrant or a passage migrant to the U.K. Some of our breeding birds are considered fairly sedentary, particularly those dwelling in gardens, but half the adult breeding population and two-thirds of first-year song thrushes are considered to be migratory, wintering in north-west France, northern Spain and Portugal to the Balearics. In addition, considerable numbers of nocturnal travelling song thrushes cross the North Sea each autumn to overwinter in the U.K from Scandinavia, Germany and Russia.

3. Current Status

National status

The song thrush has been in more or less continuous decline over the last 30 years. In 1970 the Common Bird Census (CBC) estimate of the U.K. population was just over 3 million breeding pairs, which represented a significant recovery following a harsh winter in 1962/63 that had reduced the population to just over 2 million pairs. However, since 1970 the CBC estimate has steadily dropped to just over 1.1 million breeding pairs [RSPB03]. RSPB research shows that between 1972 and 1996 there was a 66% decline in song thrush numbers on farmland and 39% decline in woodland habitats. There has however been a slight recovery in the last decade, with song thrush numbers from the BTO/JNCC/RSPB Breeding Bird Survey (BBS) showing an 18% increase nationally between 1994 and 2003 [BBS04].

Regional status

National trends of decline seem to have been reflected within the London area. However, while the last decade has brought some relief to the national figures, the BBS figures for London indicate a significant 29% decline in the population between 1994 and 2003 [BBS04].

These figures are further supported by other indicators around the London area. For example:

- Ringing totals for this species (Dartford Ringing group) fell from 146 in 1987 to 18 in 1996 [LBR96].
- In 1997 there were 38 territories on Wimbledon Common (down from 45 in 1996).
- London Bird Report figures in the late 1990's indicated recent declines. As can be seen from Table 1, song thrushes became slightly less widespread across London sites between 1994 and 1998, showing signs of decreasing abundance in those squares where it was still found, although this trend appeared to slow towards the end of the period.

Table 1: Measures of change for song thrush found in London BBS squares (standard areas of recording based on the National Ordnance Survey grid) from D. Coleman [LBR98].

	1994	1995	1996	1997	1998
Percentage of squares recorded	68	71	73	60	60
Mean count on survey in squares where it was recorded	2.6	2.9	2.3	2.1	2.0

Local status

The exact status of the song thrush in Richmond Borough needs to be determined, although it is likely to occur and breed wherever there is suitable habitat, including gardens. Some attempt has been made to informally determine song thrush numbers at a number of specific sites within the borough:

- 26 reported territories on Ham Lands (May 2005)
- 13 reported territories in Richmond Park (2004)
- 6 reported territories on Barnes Common (Spring 2004)
- 32 singing males along a 3.5-kilometer stretch of the Crane Corridor (January 2005) and 23 reported territories (April 2005). (Note that the January figures in this case may include additional wintering birds.)

4. Specific Factors Affecting the Species

Although the exact reasons for the steady decline of the song thrush are not yet fully determined, there are several factors whose combination may be sufficient to explain the downward population trend. Recent work by the BTO [RGB04] suggests that survival rates of fledglings and first year birds may particularly drive population changes. Birds at these stages in their cycle are particularly vulnerable to most of the following pressures.

4.1 Habitat loss

During the breeding season song thrushes need nest sites low in dense vegetation. Over-management of suitable habitat, including reductions in shrub cover or removal of hedgerows, are likely to be detrimental to song thrush numbers by reducing the supply of suitable nest sites and exposing nests to predators. While habitat loss has been most significant in agricultural areas (note that there is a significant amount of farmland within West London, to the west of Richmond Borough) there is anecdotal evidence that a reduction in urban shrub cover may well be affecting song thrush populations throughout the London region [LBP04]. As our opening quote from D.H. Hudson in 1928 suggests, this issue is not a new one.

4.2 Food supply

Research indicates that a number of combined factors may be affecting the regular food supply of song thrushes, leading in turn to pressures on fledgling birds in particular (about half of all song thrush fledglings die within their first 45 days, and two-thirds within 70 days [RGB04]) as well as possibly affecting the number of broods (song thrushes on intensive arable farmland make only 2-3 nesting attempts per year, compared to 4-5 attempts for birds in a stable population [RSPB02]):

- Greater use of pesticides in the countryside and in gardens has reduced available food. Note that the reduction in song thrush numbers in agricultural areas has resulted in gardens becoming an increasingly important habitat. Certain molluscicides such as slug pellets not only reduce the number of available slugs, but are also known to be toxic to song thrushes.
- Periods of cold, snowy weather in winter and hot, dry weather in summer lead to difficulties for song thrushes in locating sufficient earthworms and soil-dwelling invertebrates.
- Changes to habitat such as land drainage have reduced foraging habitat.
- Cropping methods and rotations have led to a decline in organic matter in the soil, which in turn leads to a reduction of song thrush food supply.

4.3 Other factors

Several other factors have been suggested for declining song thrush numbers, although it seems unlikely that these are as significant as habitat loss and food supply decline (although none of these can be categorically ruled out):

- **Increased predation by corvids, sparrowhawks, foxes and cats**. Research has however indicated that magpie and sparrowhawk numbers on 250 study farms across lowland Britain are not connected to song thrush numbers [RSPB02]. Further, the proportion of song thrush nests that are predated has actually fallen during the last 30 years [RSPB02].
- **Hunting in Southern Europe**. This could potentially affect song thrush breeders who migrate to hunting areas in the winter but the precise effect is hard to quantify.
- **Increased competition from blackbirds**. This has been suggested as the blackbird is a more aggressive thrush species sharing the habitat and food supply of the song thrush [SIM89]. However, BBS data [BBS04] shows similar trends for the blackbird population over the period 1994 to 2003 (slight national increase, significant London decrease) suggesting that this is unlikely to be a major population driver.

5. Current Action

5.1 Legal status

Song thrushes and their nests are fully protected under the EC Birds Directive and the Wildlife and Countryside Act 1981 (as amended), which makes it an offence intentionally to kill, injure or take any wild bird. It is an offence intentionally to damage or destroy the eggs, young or nest of a song thrush while it is being built or in use. It is therefore essential to ensure nests are not destroyed if hedge trimming or tree felling has to be carried out in the breeding season.

The song thrush is a priority U.K. BAP species.

The song thrush is a Red List species (high conservation concern) in Birds of Conservation Concern: 2002-2007 [GWN02].

5.2 Mechanisms targeting the species

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 6.

Until CBC results indicated that the song thrush was in decline it was assumed that the national song thrush population was relatively stable. The high profile of the song thrush as a familiar and widespread species has resulted in considerable focus on numbers throughout the U.K. Examples of activities are listed below:

5.2.1 National research

The RSPB and the BTO are currently undertaking research into the ecology of the song thrush and into causes of song thrush declines. The RSPB has prepared a plan for this species, which is in the UK BAP.

The song thrush is currently abundant enough to be fairly accurately monitored across the U.K. using the Breeding Bird Survey.

As there are indications that this species is increasingly seeking refuge in gardens, useful ongoing information about this species can be obtained from national surveys such as the BTO/RSPB Garden Birdwatch.

5.2.2 Local census work

Local data on song thrush numbers can be extracted from all the main national surveys, and may indicate trends without providing comprehensive local information.

In addition to national work, song thrush numbers have been studied on a local basis in many parts of the U.K., often as part of local SAP activities. Good examples of this type of activity can be found in the Cambridgeshire [CSAP] and Lancashire [LSAP] song thrush SAPs.

In London in 1998 the Borough Councils of Haringey and Islington joined forces and asked residents to take part in a survey of the song thrush. The two nature conservation teams produced a leaflet explaining why the survey was taking place and gave details of what people could do in their own gardens to help the song thrush. This covered the provision of appropriate food, as well as encouraging "wild" habitat, deterring cats and suggesting alternatives to slug pellets.

In Richmond Borough, informal monitoring of song thrush numbers has been undertaken at several specific sites. Information about song thrush numbers can also be extracted from a number of “standard walk” surveys being conducted in the borough (Bushy Park, Richmond Park, Ham Lands, Barnes Common, Crane Valley).

5.2.3 Information dissemination

As well as pushing the plight of the song thrush in national media, the RSPB has produced an advisory sheet containing guidance for landowners.

See Section 5.2.2 for an example of dissemination from Haringey and Islington.

A song thrush pledge concerning the use of molluscicides was selectively distributed in Richmond and Kingston Boroughs in 2001.

6. Objectives, Actions and Targets

Most of these actions are specific to this species. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Note that where a partner is identified as Richmond Biodiversity Group (RBG), this indicates that all active organisations within the group will be consulted, in particular FOBC, FORCE, RBGK, LWT, TRP, WWT.

Objective 1: Establish a means of collating song thrush records in London Borough of Richmond upon Thames (and West London) in such a way that future changes in distribution and abundance can be monitored.
Target: Establish baseline data on song thrush territories in London Borough of Richmond upon Thames.

Action	Target Date	Lead	Other Partners
1.1 Contact relevant organisations to request data on song thrush in Richmond Borough.	2006	Working group	BTO, RSPB, LNHS, GIGL, RBG, SDBWS, WCC
1.2 Collate existing data and identify areas of Richmond Borough where baseline data for this species are still needed.	2006	Working group	

Target: Formalize a process through which future records can be processed.

Action	Target Date	Lead	Other Partners
1.3 Identify what techniques are being used to monitor song thrush across London.	2006	Working group	LA
1.4 Establish appropriate survey techniques for conducting easily repeatable song thrush population monitoring.	2006	Working group	
1.5 Establish a system of record data transfer to GIGL	2006	Working group	GIGL

Target: Facilitate a borough-wide song thrush survey.

Action	Target Date	Lead	Other Partners
1.6 Recruit volunteers and provide any necessary training.	2007	Working group	RBG, REN
1.7 Co-ordinate an ongoing borough-wide song thrush survey	2007	Working group	RBG

Objective 2: To ensure that song thrush population densities are retained at least to current levels throughout Richmond Borough and, where possible, are increased.
Target: Develop a strategy for encouraging sympathetic management of suburban and urban green space in Richmond Borough to the benefit of song thrush.

Action	Target Date	Lead	Other Partners
2.1 Use song thrush monitoring data to identify areas of potential song thrush habitat where improvements could be made to boost local populations.	2008	Working group	LA, RBG, BTCV
2.2 Liaise with relevant land managers and provide information on habitat management techniques sympathetic to song thrush.	2008	Working group	LA, RBG
2.3 Contribute to management plans for areas within Richmond Borough with existing or potential for song thrush populations.	Ongoing	Working group	LA, RBG
2.4 Lobby for safeguards within the planning framework to ensure that survey and mitigation are included whenever song thrush populations might be affected.	Ongoing	LA	Working Group

Objective 3: To raise the awareness of song thrush conservation issues within Richmond Borough.
Target: Disseminate information on song thrush conservation to residents and organisations within Richmond Borough.

Action	Target Date	Lead	Other Partners
3.1 Prepare a song thrush conservation fact sheet of local relevance that can be distributed within Richmond Borough.	2006	Working group	LA, RBG, REN
3.2 Provide a local press release to highlight issues concerning song thrush conservation in Richmond Borough.	Annually	Working group/LA	REN
3.3 Organise a series of song thrush walks in areas of local song thrush habitat.	2007	Working group	RBG

Relevant Action Plans
Local Plans

Broad-leaved Woodland HAP, Veteran Trees/Ancient Parkland HAP

London Plans

London Plans include Woodland, Heathland Habitat, Wasteland Habitat, Churchyards and Cemeteries, Private Garden, Parks, Squares & Amenity Grassland, Woodland Audit, Open Landscapes with Ancient/Old Trees Audit, Heathland Audit, Churchyards and Cemeteries Audit, Railway Linesides Audit, Farmland Audit, Private Gardens Audit, Parks, Amenity Grasslands and City Squares Audit, Urban Wastelands Audit and Hedgerows Audit

National Plans

UK Song Thrush SAP, available from http://www.ukbap.org.uk/

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Abbreviations

BBS - Breeding Bird Survey
BTO - British Trust for Ornithology
CBC - Common Bird Census
FOBC - Friends of Barnes Common
FORCE - Friends of the River Crane Environment
GIGL - Greenspace Information for Greater London
HLR – Ham Lands Ranger
LA - Local Authority (London Borough of Richmond upon Thames)
LNHS - London Natural History Society
LWT - London Wildlife Trust
RBG - Richmond Biodiversity Group
RBGK – Royal Botanic Gardens Kew
REN – Richmond Environment Network
RSPB - Royal Society for the Protection of Birds
SDBWS - Surbiton District Bird Watching Society
TRP – The Royal Parks (Richmond & Bushy)
WCC - Wimbledon Common Conservators
WWT - Wildfowl and Wetlands Trust

Working group: includes representatives from FOBC, FORCE, HLR, TRP and WWT.

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Richmond upon Thames
Species Action Plan
Stag Beetle

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1. Aims

- To protect, conserve and enhance nationally significant populations of stag beetle in London Borough of Richmond upon Thames.
- To ascertain the reasons for uneven distribution of stag beetle populations across the borough.
- Increase public awareness of the importance of stag beetle and that of the dead wood habitat.

2. Introduction

The vernacular names of billywitches, oak-ox, thunder-beetle and horse pincher give an indication of the mythology that has evolved around the stag beetle (*Lucanus cervus*). Ancient associations with storms and magical powers led to the beetles being both feared and revered.

The stag beetle is Britain's largest terrestrial (ground-living) beetle, reaching up to 7cm in length. Featuring shiny chestnut-violet wing-cases, the stag beetle is characterised by possessing large mandibles (jaws), which are antler-shaped in the male, giving them their common name. These 'antlers' are used for fighting other males, whereas the female's mandibles, being smaller, are more powerful.

The stag beetle requires dead wood to complete its lifecycle. The eggs are laid underground in the soil next to logs, or stumps of dead trees and the larva (or grub) will spend up to seven years in the wood, slowly growing in size. 'Artificial' wood is also utilised, especially sunken fence posts. Perhaps surprisingly, London is nationally significant for stag beetle populations as the capital reported 30% of the 1998 national records. Adults emerge from mid-May until late July. Males emerge earlier and appear to be more active as they search for females to mate, and can often be seen flying on sultry summer evenings an hour or two before dusk. Adults are short-lived, as many are predated within days of emerging.

3. Current Status

The stag beetle has been recorded from most of London but the key boroughs are all South of the Thames except Hounslow & parts of Richmond, although there are clusters of records in places such as Winchmore Hill and Hornchurch.

Gardens appear to be the most important habitat for the beetle in London perhaps because most people are likely to be in their gardens when beetles are likely to be active. The significance of parklands in areas such as this Borough is unclear as until recently there have been no systematic surveys in Parks. Domestic gardens may be crucial to the conservation of the stag beetle in the capital given that many experts believe they do not fly far to find a mate. However, the increasing density of urban housing may militate against future domestic gardeners' contributions.

4. Specific Factors Affecting the Species

4.1 Reduction of dead wood

In earlier centuries dead wood would have been reduced through the intensive management and loss of woodlands. Although some 'tidying up' still continues in woodlands and parks, managers are now much more aware of the need to retain dead wood as part of the woodland ecosystem and this will have benefited stag beetles at a local level. Similarly, changes in the management of parks have led to the retention of dead wood, although this policy was always maintained in Richmond Park.

4.2 Loss of habitat to urban development

Habitat has been lost in London through suburban expansion in the inter-war years. Although the introduction of the Green Belt led to the restriction of suburban expansion, many of London's open spaces including woodland have been developed. Development will continue to result in the loss of stag beetle habitat, especially as there is a lack of awareness of the beetle's presence on sites as the adults are only visible for a few weeks a year.

4.3 Direct human impact

Adult stag beetles are attracted to the warm surfaces of tarmac and pavements, making them particularly vulnerable to being crushed by traffic or human feet. Public fear and misunderstanding of the species also leads to intentional killings of the beetles and their larvae.

4.4 Predation

Predators such as crows, magpies, cats, foxes, and others may have an adverse impact at the most vulnerable stage in the beetle's life cycle, when adults are seeking to mate and lay eggs. Indeed, it has been suggested that the rise in magpie and carrion crow numbers in the last decade has had a significant impact on stag beetle populations.

5. Current Action

5.1 Legal status

The stag beetle is listed under Schedule 5 of the Wildlife and Countryside Act 1981, as amended but only to prevent trade. A major threat to stag beetles, especially in Europe, has been from private collectors, although this legislation aims to stop the species from being collected for sale at entomological fairs. It is also listed under Appendix III of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, 1979 and Appendix II of the Habitats Directive. The latter requires the UK to designate Sites as Special Areas of Conservation (SAC) specifically to protect the stag beetle. Wimbledon Common, Richmond Park and Epping Forest are all candidate SACs.

5.2 Mechanisms targeting the species

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 7.

5.2.1 Survey and research

In 1998 and again in 2002 the Stag Beetle Focus Group conducted a national survey, collecting a total of around 15,000 records for the species and providing an updated and considerably more accurate picture of the UK distribution.

The London Wildlife Trust piloted a survey in south London in 1997, which contributed to the 1998 national survey and has continued surveying in key areas in 1999 and 2000. It has also actively promoted the species to the media, hosted a website recording form for stag beetle and a garden

wildlife survey form for several species including the stag beetle as well as stimulated interest in the beetle through press releases, newspapers, radio, TV and other media to the general public.

In Richmond we have encouraged landowners, managers, schools and members of the public to introduce loggeries/nest boxes. However, Richmond Park was always under surveyed and because so much historic parkland exists in Richmond it was considered important to arrange a proper survey to act as a flagship.

5.2.2 Richmond Park and Wimbledon Common Stag Beetle Project

Wimbledon Common is not in LB of Richmond upon Thames but it shares a boundary across the A3 Road with Richmond Park. Both sites are cSACs so a joint operation covering both areas was established in autumn 2003. Royal Holloway University became part of the partnership but work on the Common has not taken place but someone has now been found to start to take this forward.

5.2.3 Advice

In 1998 PTES produced '*Stags in Stumps'*, a leaflet aimed at land managers. Managers have since begun to take account of the species in site management plans, and it is likely this will develop further. In addition, wildlife gardening campaigns by London Wildlife Trust, local authorities and others have promoted stag beetles and dead wood conservation. In 2003 PTES published another leaflet, '*Stag Beetle Friendly Gardening',* to promote these aspects, and London Wildlife Trust produced '*Stag Beetle; an advice note for its conservation in London'* specifically aimed at the capital, which also covered survey and planning issues.

6. Objectives, Actions and Targets

Most of these actions are specific to this species. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: To significantly increase stag beetle populations in LB Richmond-upon-Thames
Target: Increase the provision of habitats within its current known range by 2010

Action	Target Date	Lead	Other Partners
1.1 To cooperate with Richmond Park & Wimbledon Common Stag Beetle Working Group to promote monitoring of the species in sites across the Borough	2005	TRP & WC SBP	EN, LA, PTES, W&PCC, Royal Holloway & Royal Parks
1.2 Send advice note to all managers and landowners of parks, woodlands, nature reserves and major formal gardens to encourage retention of dead wood	Ongoing	LA & Working Group	RBGK, WWT, HRP, TRP & Golf Courses
1.3 Promote the retention and/or use of natural and artificial stag beetle habitats by landowners and the public.	2005	Working Group	LA, BTCV
1.4 Identify 25 key sites and install at least 2 loggeries per year in Richmond upon Thames	Annually	Working Group	LA, BTCV

Objective 2: To monitor existing stag beetle populations, and further the research on the reasons for their uneven distribution in LB Richmond-upon-Thames.
Target: Conduct repeat survey by 2005

Action	Target Date	Lead	Other Partners
2.1 Pilot a number of loggery monitoring schemes	2006	Working Group	LNHS
2.2 Undertake local initiatives to support surveys e.g. targeted data collection and developing new survey tool etc. To establish current distribution more precisely and complement national surveys and the establishment of monitoring baselines of loggeries	2006	Working Group	LA, RP & WC SBP & LNHS
2.3 Promote monitoring for a better understanding of the beetle's ecology and lifecycle.	2005	Working Group	As above + Site managers

Objective 3: To raise the awareness of the stag beetle and its needs in LB Richmond
Target: To incorporate information on stag beetle's needs into 2005 public survey

Action	Target Date	Lead	Other Partners
3.1 Use Stag Beetle Display Stand at least at one relevant events or venue per year.	Annually	Working Group	Site Managers
3.2 Conduct public survey that includes information on stag beetle conservation using newspaper and magazine articles and or websites.	Annually	Working Group	LA PTES
3.3 Produce a dead wood leaflet & website material on the protection of dead wood species in parks etc.	2006	TRP & WC SBP	LA and RBGK
3.4 Promote public engagement through walks, talks & discussions, as well as through press articles in the Borough focusing on the needs of Stag Beetles & other dead wood species in domestic gardens, parks, school & community groups grounds and other suitable locations	On going	Working Group	Site Managers and Community Groups

Objective 4: To ensure the conservation of stag beetles at London's strategically important site of Richmond Park
Target: To promote the development of a strategic plan for Richmond Park, Wimbledon Common and other candidate SAC's.

Action	Target Date	Lead	Other Partners
4.1 Support the development & promotion of a strategic plan for Richmond Park and Wimbledon Common stag beetle conservation project.	2005	TRP & WC SBP	Working Group

4.2 Support carrying out of local research on the effects of habitat and environmental factors on stag beetle populations of Richmond Park and consider the implications for other historic parklands	Annually	TRP & WC SBP	Working group

Relevant Action Plans

Local Plans
Ancient Parklands/Veteran Trees, Acid Grassland, Broadleaved Woodland

London Plans
Woodland; Open Landscapes with Ancient/Old Trees; Private Gardens; Railway linesides; Churchyards and Cemeteries; Hedgerows

National Plans
Stag Beetle

Key References

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PTES (2003). *Stag Beetle Friendly Gardening*. Leaflet, PTES. See also their website for further publications at http://www.ptes.org/stagbeetle/Stag_beetle_website/index.htm

RP & WC SBP (2004) *Public Discussion WebPages* – Includes 2004 Survey & Conference Reports

Abbreviations

EN – English Nature
HRP – Historic Royal Palaces
LB – London Borough of
LNHS – London Natural History Society
LA – LB of Richmond upon Thames
LWT – London Wildlife Trust
PTES – People's Trust for Endangered Species
RBGK – Royal Botanical Gardens Kew
RP & WC SBP – Richmond Park and Wimbledon Common Stag Beetle Partnership
TRP – The Royal Parks
W&PCC – Wimbledon and Putney Commons Conservators
WWT – Wildfowl & Wetlands Trust

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Richmond upon Thames
Species Action Plan
Tower Mustard

© Mike Waite

1. Aim

- To contribute to the conservation of Tower mustard in the UK through the maintenance of London's population in the London Borough of Richmond upon Thames

2. Introduction

Tower mustard *(Arabis glabra)* is a biennial or sometimes short-lived perennial plant of disturbed habitats on free-draining, sandy soils in grassy and wasteland places. It is a member of the cabbage family and it has smooth, grey-green leaves and produces pale yellow flowers on stems 30-100 centimetres tall. Tower mustard germinates in spring spending at least one season in a vegetative state before flowering the following May-June. It can produce abundant seeds, which appear to remain viable for many years with plants often reappearing on old sites after long periods of absence. It is nationally scarce and declining, currently known from only about 30 sites in England. Since open ground is required for germination, it will not survive when the habitat becomes overgrown. Its rarity and rather undistinguished appearance means that tower mustard is not a plant that often touches the public consciousness. It is not known to have ever had any significant culinary or medical use anywhere within its wide European range, though the Cheyenne of North America know it as a cure for the common cold.

3. Current Status

There is one large population of tower mustard in Greater London, at Stain Hill Reservoir in the London Borough of Richmond-upon-Thames, which is a Site of Metropolitan Importance for Nature Conservation. This is one of the largest populations in the country, surpassed only by a couple of East Anglian sites. This site is in secure ownership and management, which this plan seeks to maintain. Other historical records have been traced, the majority of which are pre-20th century, and do not appear to offer scope for population restoration. The plan will therefore look to other ways in which London Borough of Richmond upon Thames can contribute to research on the species and to targets for population creation by introduction to sites in the borough in the future.

4. Specific Factors Affecting the Species

4.1 Protection and Management

The continued protection and suitable management of the Stain Hill Reservoir site is crucial to the survival of this species in London Borough of Richmond upon Thames and Greater London. Management guidelines involve cutting back growth to prevent excessively dense vegetation and shading from occurring and some light disturbance needs to be carried out when the grassland becomes closed and tussocky. Cutting should take place after mid-winter (as the plant retains seed in the pods throughout the winter) or alternatively the seeding stems should be broken off before cutting and returned to the site. The northern part of the embankment needs to be strimmed to remove excess vegetation and to disturb the accumulated vegetation litter and the soil. Overgrazing by rabbit's means that plants may need to be caged to ensure some return of seed to the soil, but cages should be removed during the winter to allow rabbits access to graze and disturb the vegetation.

4.2 Other

Other historic sites in London have been lost through development or changes to habitat. Nationally, it has suffered due to the loss of open habitat on heathland, through building development, agricultural improvement and intensification, forestry and neglect.

Habitat neglect results in a lack of open ground for regeneration and the development of coarse competing vegetation. It is also vulnerable to high levels of overgrazing by rabbits.

5. Current Action

5.1 Legal status

Tower mustard is classified as *Vulnerable* in the UK.

Tower mustard receives the same protection as all other wild plants in the UK through the Wildlife and Countryside Act 1981 (as amended). Therefore, it may not be uprooted without the permission of the landowner.

Stain Hill reservoir has been designated as a Site of Metropolitan Importance for Nature Conservation.

5.2 Mechanisms targeting the species

These current actions are ongoing. They need to be supported and continued in addition to the actions listed under Section 6.

5.2.1 Local management

Thames Water Utilities manage the Stain Hill Reservoir site to ensure the continued existence of the colony of Tower mustard.

5.2.2 National mechanisms

Nationally, Tower mustard is included in English Nature's Species Recovery programme and Plantlife's *Back from the Brink* programme. *Back from the Brink* recovers wild plants through practical, hands-on response to the crisis of species loss and decline in Britain.

5.2.3 Advice

Plantlife advises landowners and managers of the importance of this species and the most appropriate management for its conservation under the *Back from the Brink* programme. Advice is available to anyone managing a site for one of the *Back from the Brink* species, whether the site is a nature reserve or in private or public ownership.

6. Objectives, Actions and Targets

Most of these actions are specific to this species. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: Ensure the protection and suitable management of the extant population.
Target: No long-term reduction in size of the Stain Hill population, measured annually.

Action	Target Date	Lead	Other Partners
1.1 Produce advice and guidelines for the management of Stain Hill Reservoir to safeguard the Tower mustard population	2005	Plantlife	Working Group, GLA
1.2 Continue management of Stain Hill Reservoir population	Ongoing	TW	EN, Plantlife
1.3 Monitor population and reassess status at Stain Hill and supply data to Plantlife for databasing in co-operation with BSBI Threatened Plants Database	Annually	TW	Plantlife, BSBI, GIGL, WWT
1.4 Provide Tower mustard seeds to the Millennium Seed Bank at Wakehurst Place	2006	TW	Plantlife, RBGK

Objective 2: Monitor populations on demonstration plots in London Borough of Richmond, to publicise the species and learn more about its ecology.
Target: Ensure demonstration plots are self-sustaining by 2006, with accompanying interpretation material by 2008.

Action	Target Date	Lead	Other Partners
2.1 Monitor public demonstration plots at Kew (in the 'Order beds' & at 'The Rockery') and at WWT to determine whether plants are flowering, producing seed and self-sustaining	Annually	RBGK WWT	Plantlife
2.2 When public demonstration plots are self-sustaining produce suitable interpretation material for the public	2008	RBGK WWT	Working Group

Objective 3: Use seed collected from extant population and/or established demonstration plots in LB Richmond to establish new populations in other parts of London Borough of Richmond upon Thames or Greater London.
Target: Establish one new population as an interpreted demonstration plot and one introduced wild population by 2008.

Action	Target Date	Lead	Other Partners
3.1 Research historical records and establish where Tower mustard used to originate in London to find suitable receptor sites	2005	Plantlife	Working Group
3.2 Use historical records to establish an introduced wild population of Tower mustard at a suitable receptor site in Greater London	2008	Plantlife	Working Group, TW
3.3 Choose and establish another public demonstration plot at a suitable site in LB Richmond	2006	Working Group	LWT, GLA

3.4 Produce suitable interpretation material for the demonstration plot for the public	2008	Working Group	

Relevant Action Plans

Local Plans

Acid Grassland

London Plans

Wasteland, Private Gardens, Churchyards and Cemeteries, Heathlands, Acid Grassland, Built Structures, Ponds, Lakes & Reservoirs Audit

National Plans

Tower Mustard Species Action Plan

Key References

Davis R (1999). *Species Action Plans for Plants: Tower Mustard,* Plantlife.

Abbreviations

BSBI - Botanical Society of the British Isles
EN - English Nature
GIGL – Greenspace Information for Greater London
GLA – Greater London Authority
LWT – London Wildlife Trust
RBGK - Royal Botanic Gardens Kew
TW – Thames Water
WWT – Wildfowl & Wetlands Trust

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Richmond upon Thames
Species Action Plan
Water Vole

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"A brown little face with whiskers. A grave round face, with the same twinkle in its eye that had first attracted his notice. Small neat ears and thick silky hair. It was the water rat !" (Kenneth Grahame, The Wind in the Willows, 1908)

1. Aim

- To conserve London Borough of Richmond upon Thames's (LB Richmond) Water Vole population and increase their range and numbers for the benefit of current and future generations.

2. Introduction

The former widespread distribution and abundance of the Water Vole (*Arvicola terrestris*) has meant that it has attracted little or no previous conservation interest. However, its accelerating decline in numbers and the resulting fragmentation of its population across the UK is of great concern.

As one of the main characters in the Children's classic *The Wind in the Willows*, the water rat or Water Vole as it is properly called, is a well-liked and familiar animal amongst the general public – with their short, blunt muzzle, small hairy ears and plump, rounded body. Water Voles are not overly sensitive to the presence of people and may be easily seen during the day where they still survive. This high profile presents opportunities to bring the species' plight to the attention of people living in LB Richmond, publicise progress of the Action Plan and involve the borough in its conservation.

The Water Vole is potentially an excellent flagship species, whose presence reflects healthy waterside habitats and their associated plant communities.

3. Current Status

The changing fortunes of the British Water Vole population through the 20th century has only recently come to light, following the pioneering national surveys conducted by the Vincent Wildlife Trust in 1989-90 and 1996-98. These surveys confirmed that the species has become progressively scarcer along our waterways since the 1930s, due to habitat loss and land-use changes associated with the intensification of agriculture in the wider countryside. Since the 1980s, this decline has accelerated due to predation by feral American Mink (established as escapes from fur farms). The decline has now developed into a serious population crash with a

further 88% loss to the remaining populations in only seven years (1991-1998). This makes the Water Vole the most rapidly declining mammal in Britain.

In Greater London, the Water Vole has disappeared from over 72% of the sites it occupied previous to 1997 (LMG Greater London Water Vole Survey 1997). Although the species still retains a widespread distribution around much of London's periphery (especially in outer boroughs including LB Richmond, neighbouring LB Hounslow and to a lesser extent LB Kingston upon Thames), populations are highly localised and fragmented.

In LB Richmond, the Water Vole is currently confined to a few extant sites including the Longford River (BII 2) where it runs through Bushy Park (M84) and London Wildlife Trust's (LWT) Crane Park Island reserve on the Crane Corridor (M 76). Outlying sites on the edge of the borough include a population south-west of Feltham Marshalling Yards (M7) in LB Hounslow further west along the Crane Corridor. Recently, a population was introduced at the Wildfowl & Wetlands Trust's (WWT) London Wetland Centre at Barn Elms (M 87). Populations reported at Lonsdale Road Reservoir (BI 2) in the late 1980s are believed to be extinct. However, opportunities exist for further introduction programmes at certain sites in the borough e.g. the Beverley Brook in Richmond Park (M 82).

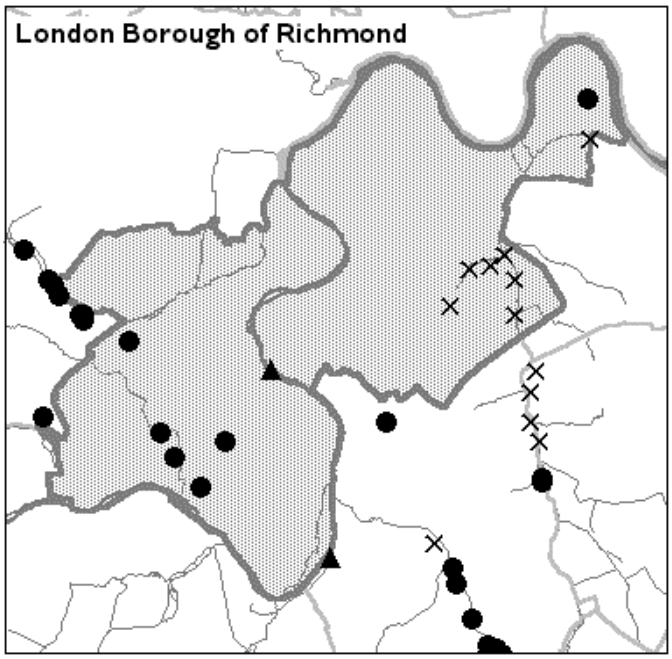

Fig 1. Records for water voles in Richmond 2001-2003.
Positive survey = ●, negative = **x**, mink = ▲
(source: London Water Vole Project)

4. Specific Factors Affecting the Species

The many factors that influence the survival of this species are outlined below. They are listed in order of priority, but each may have a greater or lesser local effect depending on the robustness of the individual populations and their habitat.

4.1 Fragmentation and isolation of habitats and populations

This is viewed as being a major factor of concern. Loss of wetland habitats has reduced populations and left them more vulnerable to other threats such as predation. Development, land drainage, low water levels, river engineering and changes in waterside management have all destroyed habitat. Intensive grazing and trampling by livestock along watercourses also contributes greatly to habitat loss in some of the more rural boroughs, but equally might apply to LB Richmond where the impact of both livestock and deer herds should be considered.

4.2 Predation by mink

The arrival and spread of mink along a waterway has been found to have serious consequences for Water Voles and rapid extinction of some Water Vole colonies has been recorded. Mink predation is influenced and exacerbated by other threats such as habitat loss. The current status of mink in the London boroughs is unknown. However, there have been recent reports of mink in LB Richmond at Ham Lands, Longford River, River Crane and the River Thames towpath at Teddington in 2001. These reports flag up the vulnerability of extant Water Vole populations, which lie in close proximity to where mink have either been seen or left field signs.

4.3 Disturbance of riparian habitats

In the past, channelisation and subsequent dredging operations as part of flood defence management caused the most significant form of disturbance. These modifications have had a drastic effect on Water Vole habitat causing the destruction of burrows, loss of emergent and in-stream vegetation and the re-profiling or hard engineering of the banks. Mechanical cutting and removal of bankside vegetation may also be highly disturbing to Water Voles.

Water Voles are relatively tolerant of human recreational activities (dog walking, angling and boating) along waterways as long as they have vegetation cover in which to hide.

4.4 Deterioration of riparian habitats and reduction of flow

Water voles appear to be relatively tolerant of low water quality, but the full impacts of different types of pollution such as industrial effluent are unknown. Low flows and droughts such as those caused by over-abstraction of groundwater can lead to the loss of Water Voles. By contrast, prolonged flooding can also be detrimental. Furthermore, increased shading by trees and the spread of Indian (Himalayan) Balsam adds further pressure to riparian vegetation along margins of the River Crane, over time making the habitat less suitable for Water Voles.

4.5 Rodenticides and rat control

Poisoned grain or similar rodenticides placed for rats or mice may be taken by Water Voles if placed along a watercourse. The proliferation of rats along a waterway, attracted by litter and human refuse, may be detrimental to Water Voles which may be out-competed or even fall prey to their larger cousins. Carried out carefully, rat control has been shown to be beneficial to Water Voles.

When controlling rats near watercourses there are a number of ways in which unnecessary destruction of water voles can be avoided:

1. Check thoroughly for water vole signs before treatment on waterways.
2. If water voles are present the only safe option is to live trap. These should be carefully sited and checked twice per day to release captured voles.
3. Do not use back-break or snap traps.
4. If there is no feasible alternative, poison should be covered or enclosed in a bait box and placed at least 5m from the water's edge.
5. Do not place poison or traps in burrow entrances (This would constitute a breach of the law).
6. Place poison off the ground if possible as water voles are less likely to climb than rats.
7. Avoid the use of poisoned grain, pellets or liquid bait, use instead wax or soap blocks.
8. The treatment site should be frequently inspected. If any dead water voles are found immediately review the control method used.
9. Report any water vole sites to your local wildlife trust.

5. Current Action

5.1 Legal Status

The Water Vole has been given legal protection under the Wild Mammals (protection) Act 1996 and Schedule 5 of the Wildlife & Countryside Act 1981 (as amended).
This Wildlife & Countryside Act protection makes it an offence intentionally to:

- Damage, destroy, or obstruct access to any structure or place which Water Voles use for shelter or protection
- Disturb Water Voles while they are using such a place

This species is expected to receive full protection under the Act (in 2005 or later) making it an offence to take, possess or intentionally kill a water vole.

5.2 Mechanisms Targeting the Species

These current actions are ongoing. They need to be supported and continued in addition to the new action listed under Section 7.

5.2.1 Advice

Practical advice about Water Vole conservation and habitat management has been summarised in The Water Vole Conservation Handbook (Strachan 1998), currently under revision. Educational resources include water vole images available on CDROM through The Wildlife Trusts (note that permission from The Wildlife Trusts must be sought before use), and an education pack from English Nature: *Habitats, Interdependence and Adaptation – the Water Vole*. There are also a number of water vole resources available on the internet.

5.2.2 Waterway management

Flood defence management of waterways is being carried out in accordance with best practice guidelines to maintain Water Vole populations.

Local Environment Agency Plans (LEAPs) and Water Level Management Plans consider the requirements of Water Voles and implement actions when appropriate. This applies to all LEAPs produced for rivers in LB Richmond.

Richmond Local Authority, LA21 Richmond Biodiversity Group, LWT (Crane Park Island), WWT (London Wetland Centre) and other organisations are already promoting Water Vole conservation through habitat enhancement projects, surveys, talks and other publicity campaigns.

5.2.3 Research

National Research is currently underway, investigating translocation and reintroduction as methods to aid the species recovery. This includes the Water Vole introduction undertaken in May 2001 at WWT London Wetland Centre.

6. Objectives, Actions and Targets

Most of these actions are specific to this species. Please note that the partners identified in the tables are those that have been involved in the process of forming the plan. It is not an exclusive list and new partners are both welcomed and needed. The leads identified are responsible for co-ordinating the actions – but are not necessarily implementers.

Objective 1: Establish a baseline for future monitoring.
Target: Status and key populations assessed by end of 2001 (achieved)
Target 2: Provide an assessment of the status of water voles in LB Richmond by 2006

Action	Target Date	Lead	Other Partners
1.1 Involve the London Water Vole Project Officer in actively promoting Water Vole conservation in LB Richmond	Achieved	LWT	LA, LA21 RBG, WWT

1.2 Collate existing records of Water Vole and mink in LB Richmond	Achieved	LWVPO	EA, LA, LNHS, GLA, TRP, HRP, WWT
1.3 Identify key populations and areas where new survey and monitoring should be focussed	Achieved	LWVPO	EA, LA, LWT, TRP, HRP, WWT
1.4 Establish a programme of future monitoring of existing and newly established populations within LB Richmond	2005	Working group	LA, LWT, TRP, HRP, WWT

Objective 2: Maintain Water Vole distribution and abundance at their 2001 levels
Target: No significant decline by 2011

Action	Target Date	Lead	Other Partners
2.1 Safeguard current or potential Water Vole sites where land is grazed and encourage the protection of water courses by fencing	Reviewed annually	LA	EN, EA, TRP, HRP, WWT
2.2 Undertake the humane control of mink as a conservation tool where they threaten Water Vole populations	Reviewed annually	EA	EA, LA, LWT, TRP, HRP, WWT, angling clubs
2.3 Ensure the use of rodenticides in areas supporting Water Voles is avoided by providing leaflets and advice	Reviewed annually	LA / LWVPO	LBBF
2.4 Ensure that reviews of Environment Agency projects and plans in LB Richmond take account of strategic habitat enhancement projects focused on expanding Water Vole populations	As reviewed	EA	LA, LWT (Central Office), LWVPO

Objective 3: Facilitate recolonisation of a number of past sites and establish populations at suitable new sites
Target: Carry out reintroduction of the species in at least two suitable sites by 2008

Action	Target Date	Lead	Other Partners
3.1 Identify historic sites in addition to current sites	Achieved	LWVPO	EA, LA, LNHS, GLA, LWT, WWT
3.2 Identify at least 2 sites suitable for reintroduction	Achieved	LWVPO	EA, LA, LWT, TRP, WWT
3.3 Ensure sympathetic land management is in practice on suitable sites	2007	EN	EA, BTCV, LWT, GLA, LA, TRP, WWT
3.4 Carry out reintroduction on at least 2 sites with suitable publicity	2008	EA	TRP, WWT, LWT, LA

Objective 4: Generate an awareness of Water Voles and their requirements not only to field surveyors, but also to the general public, as well as anglers, site owners / managers and planners
Target: Undertake a series of awareness raising activities of Water Voles in LB Richmond annually (reviewed 2007)

Action	Target Date	Lead	Other Partners
4.1 Produce a flyer leaflet about Water Voles in the LB Richmond	Achieved	Working group	LA, LWT, TRP, HRP, WWT
4.2 Hold one on-site field survey workshop per year to train surveyors / volunteers to look for and report field signs of Water Voles	Annually	LWVPO	LWT, WWT, SWT
4.3 Hold at least one walk / talk per year about Water Voles	Annually	LWT / WWT	LWVPO, LA
4.4 London Water Vole display board – display at a minimum of two different venues per year	Annually	LWVPO	BTCV, RBGK, WWT, TRP, LA

Relevant Action Plans
Local Plans
Reedbeds; Tidal Thames
London Plans
Water Vole; Tidal Thames; Canals; Marshland; Reedbed; Rivers and Streams

National Plans
Water Vole; Chalk Rivers; Rivers & Streams Habitat Statement; Canals Habitat Statement; Fens, Carr, Marsh, Swamp & Reedbed Habitat Statement

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Strachan R (1998) *Water Vole Conservation Handbook*. EA, WildCRU, EN Oxford

UK Water Vole Steering Group (1997) *Species Action Plan for the UK: Water Vole,* Arvicola terrestris EA

Abbreviations

BTCV - British Trust for Conservation Volunteers
EA - Environment Agency
EN - English Nature
GLA – Greater London Authority
HRP - Historic Royal Palaces (+ Friends of Bushy & Home Parks)
LA – Local Authority (London Borough of Richmond upon Thames)
LA21 RBG - LA21 Richmond Biodiversity Group
LBBF - London Borough Biodiversity Forum
LNHS - London Natural History Society
LWVPO - London Water Vole Project Officer
LWT - London Wildlife Trust (Crane Park Island)
RBGK - Royal Botanic Gardens Kew
SWT - Surrey Wildlife Trust
TRP - The Royal Parks (Richmond & Bushy Parks Wildlife Groups)
WWT - Wildfowl & Wetlands Trust

Working group: representing LWT, LA, TRP and WWT this group meets regularly to promote conservation of this species within the borough.

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LB Richmond Water Vole Species Action Plan has largely been adapted by the LB Richmond Water Vole Species Action Plan working group from the London BAP Water Vole Species Action Plan written by Rob Strachan, Water Vole Officer for the Environment Agency.

Glossary

This glossary defines the main terms used throughout this Biodiversity Action Plan

Abstraction
The removal of water from a river or stream or other source.

Agenda 21
It is an action plan that was agreed as part of the International Agreement on Sustainable Development at the Rio Earth Summit in 1992, which sets out direct action to improve the quality of lives and safeguard the environment by aiming to halt the extinction of the world's biodiversity.

Amenity Grassland
Grassland that improves the quality of an area by contributing to the physical or material comfort of users such as places to picnic, walk, engage in leisure pursuits etc, as well as increasing the attractiveness or value of a location.

Anoxic
Absence of oxygen.

Arboriculture
The selection, planting and management of individual trees, shrubs, vines and other woody plants in the urban environment.

Backland
Land located within the floodplain of a river, associated with a backwater.

Backwater
A channel connected to a river system, sometimes only at high water.

Baseline
A defined condition for a site, habitat or species against which any future changes in the condition of the site, habitat or species can be monitored, and the significance of this change in conservation terms, assessed, so that management can be altered to maintain or enhance the site, habitat or species.

Baseline Survey
A survey of a site, habitats or species to establish baseline conditions.

Basin
A region drained by a single river system.

Benthic
Of, or relating to the bed of a river e.g. animals living on the riverbed.

Biochemical Oxygen Demand (BOD)
A measure of the amount of organic material present in water.

Biodiversity
Biodiversity or biological diversity is the variety of life in all its different forms, which includes the myriad of plant and animal species and the range of habitats in which they live.

Biodiversity Action Plan
A Biodiversity Action Plan (BAP) is an evolving strategy and delivery mechanism for the conservation of biological diversity and the sustainable use of biological resources. It is a plan that sets objectives and actions for the conservation of biodiversity, with measurable targets.

Brackish
Slighty salty conditions, as found in a river estuary

Brownfield
Any land which has previously been used or developed but is not currently in full use, although it may be partially occupied or utilised. The land may also be vacant, derelict or contaminated, but excludes parks, recreation grounds, allotments and land where the remains of previous use have blended into the landscape, or have been overtaken by nature conservation value or amenity use and cannot be regarded as requiring redevelopment.

Bryophyte
A major group of plants that includes mosses and liverworts.

Calcifuge
A plant not suited to calcareous soil.

Channelisation
Creation of a trench, furrow or groove through which water flows (eroded by the water or man-made) which then becomes the new bed of a stream or river.

Colonisation
Successful invasion of a new habitat by a species; the occupation of bare ground by soil by seedlings or sporelings.

Colony
A group of the same kind of animals, plants, or one-celled organisms living or growing together.

Community
An identifiable and distinct grouping of organisms occurring together in a particular area that interacts with each other and with their shared environment.

Conservation
The protection, management and enhancement of the environment to sustain and improve the diversity of wildlife in an area.

Coppicing
A management technique used to harvest timber by periodically cutting trees to ground level, to stimulate regrowth.

Deciduous
These are plants that loose or shed their leaves/foliage at the end of the growing season such as deciduous trees.

Distribution
The geographical range of a taxon or group: the pattern or arrangement of the members of a population or group.

Ecology
The study of living things in relation to their environment.

Ecosystem
A community of interdependent organisms and the environment in which they live and interact

Ecotype
Composition of habitats, affecting conditions in micro-habitats

Entomological
Relating to the study of insects.

Erosion
Weathering away; the removal of land surface by water, ice, wind or other agents.

Eutrophication
The over-enrichment of an aquatic habitat with inorganic nutrients, such as phosphates and nitrates, which typically occurs from sewage discharge or fertilizer run-off, resulting in an imbalance in the ecosystem.

Extant
Still existing or present, as opposed to extinct.

Fauna
It is the term used to describe all the animal life of a particular area or period.

Flagship Species
They are special plants and animals that are associated with good management of a particular habitat as well as being characteristic of that habitat. It is also a species perceived favourably by the public for reasons of aesthetics or other value, used to promote and publicise habitat conservation.

Flocculation
The propensity of things to move together in a mass or clump e.g. in a river organic material sticking together, which may then settle on the bed.

Floodplain
Land area at risk from flooding, either actively or historically

Flora
It is the term used to describe all the plant life of a particular area or period.

Genetic
Relating to genes i.e. the hereditary material

Green Corridor
A linear sequence of connected greenspaces, allowing migration of species between areas. They often consist of railway embankments and cuttings, roadside verges, canals, parks and playing fields and rivers.

Habitat
It is the natural environment where a particular animal or plant lives. The term is often used in the wider sense, referring to major assemblages of plants and animals found together, such as woodlands, wetlands or grasslands.

Habitat Action Plan (HAP)
A targeted programme of management measures aimed at maintaining, enhancing or restoring a specific habitat. Habitat Action Plan's identify a number of conservation objectives and specify actions for targeting the habitat and detail the responsibilities for achieving those objectives.

Habitat Creation
Specific site management to try and create a habitat on a site where it has not occurred before.

Habitat Heterogeneity
Variety of conditions with a habitat type.

Habitat Restoration or Recreation
Specific site management to try and restore or recreate a habitat on a site where it has once or had previously existed, but has subsequently been lost.

Heronry
A place where herons nest and breed.

Inflorescence
The complete flower head of a plant.

Intergovernmental Organisation
An organisation that works between national governments.

Invertebrates
Animals that do not have a backbone or spinal column e.g. insects

Larvae
The newly hatched, wingless, often wormlike form of many insects before metamorphosis.

Local Agenda 21 (LA21)
It is a partnership of organisations, communities and individuals, which works from 'the bottom up' on a local level to achieve sustainable patterns of development in all aspects of life.

Local Development Frameworks (LDFs)
Local Development Frameworks (LDFs) replace Structure Plans and Local Plans, as a result of the Planning and Compulsory Purchase Act 2004, which came into force in September 2004. This has resulted in major changes to the planning system.

Local Nature Reserve (LNR)
An area of land that is of special conservation interest and is of importance to both people and wildlife on a local level. LNR's are declared and managed by the owner of the site under the National Parks and Access to the Countryside Act 1949.

Management
The maintenance of a site in order to conserve and enhance its habitats and range of species, using various tools and techniques such as mowing.

Marginal Habitats
Habitats located at, or constituting, a margin, border or edge.

Marginal Plant
A plant species that occurs on the edge of a habitat or community.

Microhabitat
A small part of a habitat, which has distinct physical conditions e.g. a hollow in a tree

Monitoring
A process of repeated observations to record, test and control one or more elements within the environment such as the population of a species. Monitoring provides factual information concerning the present status and past trends in environmental parameters. Monitoring the priority habitats and species contained within a BAP will allow the assessment of how successful the BAP is in protecting and enhancing biodiversity.

Mycorrhizal Fungi
Fungi associated with the roots of plants in a mutually beneficial relationship.

National Nature Reserve
Nature reserves designated by English Nature under the 1949 National Parks and Access to the Countryside Act.

Native Species
A species that occurs and belongs naturally to an area that has not been introduced by man.

Neap Tides
A tide just after the first or third quarter of the moon, when there is the least difference between the high and low water.

Non-native Species
A species that does not occur or belong naturally to an area, but has become established and generates successfully in the new environment e.g. Japanese Knotweed

Non-Tidal
That part of a river which is not affected by the changing tide. In the case of the Thames, it is generally considered to be non-tidal upstream of Teddington Lock.

Organism
An individual animal, plant or single-celled life form.

Ornithology
A branch of zoology: the study of birds.

Parasitic
An organism that grows, feeds, and is sheltered on or in a different organism while contributing nothing to the survival of its host.

Pesticide
Any chemical or biological agent that kills plant or animal pests: herbicides, insecticides, fungicides, rodenticides, etc are all pesticides.

Plant Communities
A group of plants living and interacting with one another in a specific region under relatively similar environmental conditions.

Protected Species
Certain plant and animal species such as bats are protected to various degrees in law, particularly under the Wildlife and Countryside Act 1981 (as amended).

Pollarding
A technique that involves cutting a tree approximately 2 metres above the ground, which then produces vigorous growth of new shoots. This is commonly undertaken on willow trees.

Range
The geographic region in which a plant or animal normally lives or grows.

Red Data Book Species
These are species that are endangered, rare or vulnerable to extinction globally, nationally or locally, and are contained within catalogues that are published by the International Union for the Conservation of Nature (IUCN).

Recolonisation
The return and establishment of a species to a place where it used to occur, but has since disappeared. For example, clearing scrub encroaching on grassland habitat will allow the natural recolonisation of grassland species.

Reintroduction
The release and establishment of a species to an area within its natural range and environment but where it has been lost or has previously become extinct.

Riparian
Relating to the bank of a river or stream.

Rodenticides
Substances that are used to destroy or inhibit the action of rats, mice, or other rodents.

Run-off
The build up of water occurring at ground surface level at times when rainfall cannot be absorbed by the soil, which particularly occurs in urban areas where the ground is covered by concrete and other non-permeable materials.

Salinity
The saltiness or content of salt in a solution.

Scrub
Low growing woody species, of less than tree height, which occurs usually as a transitional stage in the succession from grassland to woodland.

Site of Borough Importance for Nature Conservation
Sites which are important in a Borough perspective; damage to these sites would mean a significant loss to the Borough.

Site of Local Importance for Nature Conservation
Sites that are or may be of particular value to nearby residents or schools. Local sites are particularly important in areas otherwise deficient in nearby wildlife sites.

Site of Metropolitan Importance for Nature Conservation
Those sites which contain the best examples of London's habitats, sites with rare species, rare assemblages of species, or which are of particular significance within large areas of otherwise built-up London, which are afforded the highest priority for protection.

Site of Special Scientific Interest (SSSI)
A site which is of national biological or geological importance, as defined by the Wildlife and Countryside Act 1981 (as amended), which is notified by a statutory conservation organisation i.e. English Nature.

Special Area of Conservation (SAC)
A site which is of European importance for wildlife, designated under the Habitats Directive by the UK Government where the necessary management is applied to maintain or restore the habitats and/or species for which the site has been designated.

Species
A group of living organisms capable of interbreeding.

Species Action Plan (SAP)
A targeted programme of measures and actions aimed at maintaining and enhancing a specific species. Species Action Plan's identify a number of conservation objectives and specify actions for

targeting the species to stabilise and improve its status as well as detail the responsibilities for achieving those objectives, based upon knowledge of its ecological and other requirements.

Spring Tides
These occur a week after the full moon, which is on average 1-2 a month and not just during the spring months

Succession
The sequential development of plant or animal communities through time.

Survey
To undertake an inventory and look at and examine the attributes and condition of a site, area or region usually in terms of the quality and presence of the habitats and species.

Sustainable Development
To use natural resources in a sustainable manner so development can meet the needs of the present without compromising the ability and needs of future generations. Biodiversity and sustainable development are inextricably linked, as the wealth of species and habitats are an indicator of our environment and general well being.

SuDs (Sustainable Urban Drainage Systems)
Sustainable Urban Drainage Systems (SuDs) are concerned primarily with the drainage of rainwater from developed or urbanised areas, often involving the concept of rainwater re-use. SuDs is a concept that focuses on decisions about drainage on the environment and people.

Sward
The grassy surface of an area of land.

Taxa
A defined group of organisms.

Thermocline
A temperature gradient in a water body.

Tidal
Relating to or affected by tides. The tidal section of a river is that part which is subject to a twice daily fluctuation in level, in response to the changing tide.

Translocation
The removal of things from one place to another: substitution of one thing for another.

Wetland
Any habitat that is characterised by standing or flowing water for part of the year.

Wet woodlands
Woodland occurring on poorly drained or seasonally wet soils, usually with alder, birch and willows as the predominant tree species, but sometimes including ash, oak, pine and beech on drier riparian areas. Wet woodlands are often found on floodplains.