

A BIODIVERSITY ACTION PLAN FOR THE LEE VALLEY REGIONAL PARK

1. INTRODUCTION

Why conserve biodiversity ?

Concern for the environment has perhaps never been greater than at the present time. It is widely recognised that unless behaviour which damages the environment is changed much of our natural resource may be lost forever. Although environmental losses in this country are no longer on the scale they were in the past, they are still steadily occurring and arguably more significant now in relation to the total resource of habitats and species remaining.

Biodiversity (the variety of life) should be maintained because our future needs and values are unpredictable. Our understanding of ecosystems is insufficient to be certain of the impact of removing any individual component. There is concern globally that if we continue to degrade what remains of our natural resources we will dangerously reduce the planet's capacity to support not only wildlife but also people.

The arguments for maintaining biodiversity are strong. An economic value may be placed on eco-tourism, on products from the environment and on ecological processes. Wetlands, for example, act as natural pollution filters, buffer the effects of flood and drought and reduce soil erosion. It must be accepted that these principles apply not only to far flung parts of the planet but equally to our local environment.

Whilst the scientific and economic rationale for conserving biodiversity can be quantified, the less tangible intrinsic value of plants and animals should not be overlooked. The natural world enriches the quality of our lives in many ways. The value of the natural resource in the Lee Valley Regional Park, especially the wetland habitats, in maintaining recreational and leisure interests should be obvious. Many people gain enjoyment from being able to walk, jog, cycle, birdwatch, picnic, fish or sail in a natural setting. Open waters that fulfil their wildlife potential will perform such functions better and more economically than habitats which have been degraded. Plants and animals contribute to local distinctiveness; the pollarded willows, dragonflies, flooded lakes and waterbirds all help define the character of the Lee Valley.

However, the natural resource of the Lee Valley is under threat. To ensure the sustainable use of this resource a strategy is required to provide a framework of objectives to work within. The maintenance of biodiversity must be seen as a key test of sustainable use. The ecology of the Lee Valley Regional Park will need to become an integral part of planning, land-use and site management. The alternative is that losses will continue and many will be irreversible and ultimately damaging to the Park itself.

The Convention on Biological Diversity

The Rio de Janeiro “Earth Summit” in 1992 was, in part, a response to the growing awareness of the importance of the global environment and a wide recognition of the continuing loss and damage. The United Kingdom was one of over 150 countries from around the world that signed a number of major outputs, including The Rio Declaration, Agenda 21 and The Convention on Biological Diversity. The Rio Declaration is a statement of principles which addresses the need to balance the protection of our environment with the need for sustainable development. Agenda 21 is an action plan for the environment in the 21st century with a particular emphasis on involving local communities. The Convention on Biological Diversity requires each country to produce a national plan of action to maintain the biodiversity within their territory. Article 6a of the Convention requires signatory countries to:

“develop national policies, plans or programmes for the conservation and sustainable use of biological diversity”.

The UK Government published the *UK Biodiversity Action Plan* in January 1994. Its stated aim is:

“to conserve and enhance biological diversity within the UK”.

At the launch of the *Action Plan* the Prime Minister announced the establishment of a Biodiversity Steering Group. This group, with representatives drawn from key statutory and non-statutory organisations, would take the process forward. It published a detailed report, *“Biodiversity: The UK Steering Group Report,”* in December 1995. This report was endorsed by the Government in May 1996 and now sets the scene for future action.

Biodiversity: The UK Steering Group Report

The report of the UK Biodiversity Steering Group Report sets out a detailed approach to conserving biodiversity in the United Kingdom. The report recognises that if biodiversity conservation is to be successfully implemented it requires a means of ensuring that actions are integrated. Key recommendations are as follows:

- the production of national habitat and species action plans;
- the establishment of a network of local records centres;
- the production of local biodiversity action plans; and
- the need to raise awareness of the importance of biodiversity conservation.

The report includes draft national action plans for 14 key habitats and 116 of our most threatened species. It also proposes that a further 24 habitat action plans and 286 species action plans are prepared within 3 years. However, biodiversity action plans at the local level are seen as the means by which national targets can be transformed into effective action on the ground. Local plans should take account of local distinctiveness and the views of local people. There is also an understanding that environmental issues are not the concern of conservationists alone. It is therefore vital that sectors of society not usually deeply involved in such issues should be included; local industry is seen as a

key partner for example. Local BAPs provide the ideal framework for involving a broad range of interests in the protection of wildlife.

A Biodiversity Action Plan for the Lee Valley Regional Park

Local biodiversity action plans (BAPs) are beginning to be prepared throughout the UK. In Hertfordshire a county BAP, "A Vision for the Wildlife and Natural Habitats of Hertfordshire", was completed in 1998. In London and Essex Biodiversity Partnerships have been set up to take the process forward.

The importance of the Lee Valley Regional Park for wildlife makes it a natural candidate for a biodiversity action plan. Although overlapping with London, Essex and Hertfordshire, the Lee Valley, with its clear ecological links between sites, has always deserved separate attention rather than being split by administrative boundaries. Integration between all the local BAPs and with existing strategies and local plans, will of course be essential.

The timing of the national and these local biodiversity initiatives is particularly apposite for the Lee Valley Regional Park with the current review of the Park Plan. Various topic statements have been prepared as part of this review, including one on nature conservation. The need for a more strategic approach to nature conservation (and other aspects of the Park's functions) has been highlighted in these topic statements.

This biodiversity action plan thus aims to meet this requirement. It is intended to inform the Park Plan review by preparing detailed objectives, targets and suggested actions for the conservation and enhancement of the Park's biodiversity. This in turn will guide the formulation of aims, objectives and policies to be incorporated in the revised overall Park Plan. The boundary for this plan follows that of the Lee Valley Regional Park.

The plan contains:

- A background to biodiversity conservation.
- An evaluation of the ecological resource of the Lee Valley Regional Park.
- An overall long-term vision for the wildlife and habitats of the Park.
- Detailed action plans for habitats and selected key species.
- Suggested actions for increasing community involvement and partnership action.

It should be clear that if any plan is to be successful it must be supported by all who have an influence on the habitats and species of the Lee Valley.

In summary, the preparation of a biodiversity action plan for the Lee Valley Regional Park will help guide the Authority's work over the coming years. It can also be seen to be an integrated part of an agreed process that feeds up through county and national plans to help meet the global commitments to the conservation and sustainable use of biological diversity.

2. THE ECOLOGICAL RESOURCE IN THE LEE VALLEY REGIONAL PARK

An Overview of the habitats of the Lee Valley Regional Park

The Lee Valley Regional Park's present landscape and vegetation reflect its own unique land-use history and environmental factors such as climate, geology and geomorphology. The result is a rich diversity of habitats and associated species.

Before the beginnings of human influence on the land around 4000BC, the Lee Valley, to the best of our knowledge, would have been a regularly shifting mosaic of water, swamp and forest. The power of periodic major floods would have resulted in changing river channels, exposed mud and sands and uprooted trees. Many plants and animals would have adapted to this unstable environment and been able to quickly colonise new ground. Over the next few thousands years, human activities slowly removed the forest, changing the valley to extensive swamp and marshland. Only during the last few hundred years did the river become progressively tamed with new channels being cut and marshes giving way to grazing pasture and hay meadows, but still regularly flooding in winter. Finally, the industrial age of the last century or so continues to leave the most significant marks on the area, with navigation and flood relief channels, sewage treatment works, power stations, gravel pits, reservoirs and other human artefacts.

The Lee Valley today is therefore a mixture of old and new habitats and associated species, all resulting to some degree from human activities. However, human intervention has created many opportunities for wildlife. Where across the UK wetland wildlife has been severely under threat, the Lee Valley has by contrast provided a mosaic of wetlands of increasing significance. The Lee Valley falls within the "North Thames Basin" Countryside Character Area, which forms part of the "London Basin" Natural Area as defined by English Nature in their natural area profile. Natural areas are the basis upon which English Nature break down the national Biodiversity Action Plan targets for England.

The main habitat types currently to be found in the Lee Valley Regional Park are as follows:

- rivers and streams;
- standing open waters;
- floodplain grassland and fen (including reedswamp, hay and fen meadows);
- wet woodland; and
- urban (including post-industrial habitats).

The characteristics of these habitats are described in the following sections.

Rivers and streams

The River Lee and its associated channels form an integral part of the ecology of the valley, providing vital hydrological links between the various wetlands of the floodplain. Although human activities have heavily influenced the entire system, several stretches of more natural channel structure remain. River classifications are based on geology, altitude, physical characteristics and plant communities. The River Lee is a lowland clay river, associated with low altitudinal sources, low gradient, base-rich water and fine/rich substrates. Typical plants include Arrowhead and Yellow Water-lily. The best stretches, such as the Cornmill Stream and Old River Lee, are of national significance, while many others are important at the regional level. Many of the associated species, such as Shining Ramshorn snail, White-legged Damselfly, Otter and Water Vole are now in decline or are threatened.

As the Lee flows into London human influences dominate the river. Here the historical and cultural associations, together with its high biological importance as a wildlife corridor heighten its importance. Most of the lower stretches have been designated as of metropolitan (regional) importance.

However, it is essential not to isolate individual stretches, the river clearly is a single ecological unit. All of the channels must be seen as of at least local importance due to the vital linkages they make with other habitats. Degraded stretches require enhancement to allow dispersal of species and there is a pressing need to restore the hydrological continuity between the river and its floodplain to allow the full potential of associated wetlands to be realised.

The intrinsic appeal of rivers is high and combined with the wildlife, cultural and landscape value, as well as the high level of accessibility throughout the valley, the river habitats are a significant local resource for people.

Floodplain grassland and fen

Floodplain grasslands and fen were formerly the dominant semi-natural habitats in the Lee Valley but have been massively reduced, mirroring national trends. They reached their greatest extent following forest clearance and were maintained by a combination of agricultural activity and the wetness of the land. Habitats such as reedswamp, hay meadow and wet grasslands are now nationally scarce. The remaining areas are small and often isolated but are of high conservation and historical importance. They support a diverse range of scarce species such as Bittern, Snipe, Meadow-rue and various invertebrates.

The fen and meadow habitats remaining at Rye Meads, Cornmill Meadows and Walthamstow Marshes are all recognised to be of national importance. The importance of the meadows at Silvermeade has only recently been recognised but is at least of county (regional) significance. The remaining sites are often fragmented and suffering from low water levels. They are vulnerable to the successional changes that occur if traditional

management ceases. They act as a refuge for a range of scarce or declining species and if maintained have the potential to facilitate range expansion to restored or newly created sites. They therefore form a vital link in the ecology of the Lee Valley.

Standing open water

Open waters include all freshwater systems comprising standing water or waters lacking any dominant flow. They include natural systems such as lakes and pools, as well as those resulting from human activities such as gravel pits, reservoirs and ponds. These waters support large amounts of vegetation and a wide variety of animals. Many of them are important breeding and wintering sites for waterbirds such as Shoveler, Tufted Duck and Great Crested Grebes.

The amount and size of the open water habitat is a key feature of the Lee Valley Regional Park. The associated bird communities are recognised to be of international importance. Four sites are proposed as the Lee Valley Special Protection Area under the EC Birds Directive. Four of the 7 SSSI's are notified at least partly on the basis of the communities associated with the open water habitats. More scarce species, including birds, aquatic flora, invertebrates, fish and mammals, are associated with open water habitats than any other habitat in the valley. Although of recent human origin they, in some way, compensate for the massive loss of wetland habitats throughout the country and now remain as last refuges for many species. In time they will come to more closely resemble natural systems and may be valued in a way that the Norfolk Broads are now.

Although abundant, the open water habitats vary in quality and ecology due to such features as nutrient status, use, size and structure. Clear water habitats with rich plant communities are valuable, as are large sites with reduced disturbance. The intrinsic appeal of open waters is high. Those supporting large numbers of waterbirds are visually attractive. The potential for management to benefit both wildlife and people is high.

Wet woodland

If natural succession in marshes and fens is allowed to continue unhindered, colonisation by shrubs and trees will occur to form woodland. Where the over-riding wetness of the ground remains the key environmental factor they are dominated by Alder or willow trees and as a group are often termed "carr" or "wet" woodlands. Such wet woodlands are a typical feature of old gravel workings in river valleys and although almost entirely of recent origin represent a localised resource. At least one nationally scarce species, the Musk Beetle, is associated with the habitat and a number of species, notably birds, are dependant on the intimate mix of wetland habitat of which carr is an integral part. The carr woodlands around the gravel pits are judged to be of county (regional) importance.

Carr woodland and the traditional willow pollards form valuable landscape features in the valley, giving scale and backdrop to the open water. However the wetness and inaccessibility of carr woodland reduce its potential as a public amenity.

Dryer scrub communities are developing on many areas of disturbed ground or rough grassland in the valley. Such areas can be important for birds and insects in particular. However, the development of dense scrub on ancient fens or meadows is generally detrimental.

The native Black Poplar (*Populus nigra* ssp *betulifolia*) would have been a component of the wet woodlands in the past. Only one tree now remains, at WalthamPark.

Urban habitats

Post-industrial urban habitats are a major feature of the Lee Valley Regional Park. The ecological value of these habitats, such as Pulverised Fuel Ash (PFA) dumps, redundant water treatment works and “wastelands” in general, have frequently been undervalued due to their obvious human influences and recent origins. However, such habitats may support a diverse range of wildlife in a stressed environment. The new associations of species that are occurring are interesting in their own right and have considerable ecological, educational and research value. The fact that many provide the only wildlife habitat available in urban areas increases their importance.

Urban and post-industrial habitats are an extremely valuable educational resource in terms of both industrial archaeology and nature conservation. In many cases the richness of plant and insect life can provide a high level of intrinsic appeal for local people and the sites may also provide links with the past. The challenge is to maintain the value of such habitats as in some cases there is a high level of non-recreatability.

Vegetational succession on PFA has been likened to sand dune colonisation with salt-loving plants being replaced by species typical of dune slacks. Such a rare resource is valuable in both conservation and educational contexts. The Lee Valley has some of the finest examples of PFA succession in the country. The swarms of orchids are of very high intrinsic appeal and attract high numbers of visitors. Although the process of assessment is difficult it is likely that such habitats are of national significance.

An overview of species diversity in the Lee Valley Regional Park

The habitats of the Lee Valley Regional Park support a diverse range of plants and animals, principally associated with the wetlands. Over 200 species of birds have been recorded, around 150 occurring annually. Thirty-two species of mammal and over 500 species of flowering plant have been recorded throughout the valley. Twenty-one species of dragonfly occur, half of the UK total. Within this diversity individual species or assemblages are significant from local up to international level. The total of over 10,000 wintering waterbirds is of European importance while the flora includes many wetland species in widespread and general decline.

Birds

The Lee Valley Regional Park is important for birds at all times of the year. The proposed Special Protection Area designation under the EU Birds Directive (including the Rye Meads, Chingford Reservoirs, Walthamstow Reservoirs and Waltham Abbey Woods SSSI's) recognises the winter assemblage of waterbirds as being of international (European) significance. Two species of duck, Gadwall and Shoveler, both reach accepted levels of international significance on an individual basis. Many other waterbirds (including Tufted Duck, Smew, Cormorant, Great Crested Grebe, Coot and Bittern) reach levels of national significance. The wintering numbers of many other birds, ranging from Siskin in wet woodland to pipits and wagtails on sewage treatment works, are of regional or local importance. Overall the wetlands of the Lee Valley Regional Park represent one

of the major inland wintering areas for birds in the UK, supporting over 10,000 waterbirds every winter.

Late summer moult assemblages of Tufted Duck and Pochard are of international and national importance respectively. Moulting duck require undisturbed sites with a good food supply.

Breeding populations of Grey Heron, Pochard, Gadwall, Tufted Duck and Cormorant are of national importance, while those of Common Tern, Kingfisher, Yellow Wagtail, Coot, Great Crested Grebe and Lapwing all reach the regional level. At the local level a number of species are significant. For example, the totals of both Sedge and Reed Warbler represent significant percentages of the London, Hertfordshire or Essex totals. A range of species are also important in that the Lee Valley Regional Park represents a stronghold (albeit maybe small) of a declining and threatened local population. Snipe, Redshank, Grasshopper Warbler and Nightingale may all be mentioned here.

Observation over many years has shown that the valley is very important for large numbers of birds on migration in both spring and autumn. Wetland birds such as waders, terns and gulls are amongst the most obvious but work by the Rye Meads Ringing Group, for example, has shown that many hundreds of warblers, swallows, martins and other small birds find suitable resting and feeding areas in the valley whilst on migration.

Birds of Conservation Concern, published in 1996 on behalf of the UK's bird conservation organisations assigns birds to one of three categories: red, species of high conservation concern; amber, species of medium conservation concern; and green, all other species which are of lower concern. Red list species are those whose population or range is rapidly declining, recently or historically, and those of global conservation concern. Several of the red list species occur in significant numbers in the Lee Valley. These include Bittern, Turtle Dove, Skylark, Song Thrush, Tree Sparrow, Linnet, Bullfinch, Reed Bunting and Corn Bunting. An even greater number of the amber list species occur in the valley and include many of the species already mentioned above.

Plants

The Lee Valley is highly significant on a regional and local basis for the abundance and variety of wetland plants. As a group wetland plants have generally shown severe reductions in range as wetland habitats have become degraded or lost.

Submerged aquatic plants of clear, flowing or still waters, are one group of significance. They include the Fan-leaved Water Crowfoot, Whorled Water-milfoil, Shining and Flat-stalked Pondweeds and the nationally scarce River Water-dropwort. Sections of the river system are important for these plants but the key areas are the gravel pits isolated from the river system. The Lee Valley gravel pits have recently been identified as an important area for Stoneworts, a group of aquatic algae.

Disturbed wetland habitats have their own distinctive flora. Species such as the Pink Water Speedwell are uncommon locally while the Marsh Dock, which is very much a feature of temporary muddy habitats throughout the Park, is nationally scarce.

The last few fen and meadow habitats remain strongholds for characteristic local species such as Meadow-rue, Meadow Saxifrage, Slender Tufted Sedge, Yellow Vetchling and Adders-tongue Fern. Marsh Arrowgrass occurs in relict damp grassland on the west side of King George Reservoir. Drier, sandier habitats typically support the locally uncommon Hares-foot Clover, Annual Knawel and Knotted Clover.

The plant communities of wasteland include a number of unusual introductions. These include Mexican Tea, Thorn-apple, Greek Dock, Flax and Warty Cabbage.

Invertebrates

A lack of comprehensive data prevents a thorough assessment of the value of the Lee Valley for invertebrates. Some groups, such as dragonflies and grasshoppers, have been well studied while others have had scant attention. However, a number of rare species have been identified and their presence is likely to be indicative of rich invertebrate habitats. Present knowledge points to the wetland and grassland habitats as being of most importance. In addition, veteran trees are known to provide important habitats for invertebrates.

Aquatic molluscs have been sampled at the Cornmill Stream/Old River Lee and include the nationally threatened Red Data Book Shining Ramshorn snail, associated with grazing marsh ditches. A number of other local or notable species also occur here or at nearby sites. Other aquatic invertebrates are poorly studied but older records of scarce bugs, such as lesser water-boatman species, hint that important species remain to be discovered, probably in the richer or older wetland habitats.

The large and spectacular Musk Beetle is a nationally scarce species associated with willows, especially pollards. It has been found at several sites in the valley.

The Orthoptera (grasshoppers and bush-cricket) are well represented in the valley. Roesel's Bush-cricket, Short and Long-winged Coneheads, Lesser Marsh Grasshopper and Slender Groundhopper are all of at least local significance. The Lee Valley contains the richest orthopteran sites in Hertfordshire and must be rated highly for both Essex and London. It is however the overall abundance of the assemblage of both scarce and commoner species that is most significant, raising the Lee Valley to at least regional, and probably national, significance for this group. Rank permanent grassland, preferably damp, and disturbed ground are key habitats.

Three notable dragonflies breed within the valley; Hairy Dragonfly, Ruddy Darter and White-legged Damselfly. Population levels of Red-eyed Damselfly are of local importance. Overall the dragonfly fauna is rich throughout the valley, with around half the UK total recorded. The remaining good quality water courses, ditch systems, clear weedy gravel pits and early succession pools are key habitats.

Butterflies are generally poorly represented although the local Essex Skipper is widespread and abundant in the valley on rank grassland and the declining White-letter Hairstreak is associated with hedgerow Elms. The Small Heath is worthy of mention. It has declined alarmingly and is now only present in 18% of tetrads in Herts and Middlesex

but is still present on Tottenham (Clendish) Marsh. A number of scarce fenland moths are recorded from Rye Meads.

Other groups

Sixteen species of Red Data Book mammals occur in the Lee Valley Regional Park. Populations of Otter, Water Vole and bats are judged to be of regional significance. The Otter and all bats are specially protected species under Schedule 5 of the Wildlife and Countryside Act. Eight species of bats have been recorded in the valley including the nationally scarce Leisler's and Serotine with UK populations estimated at 10,000 and 15,000 respectively. Veteran trees may provide important roosts for bats. Harvest Mouse and Water Shrew are of local importance.

The Lee Valley remains a regional stronghold of the Grass Snake and is of local importance for amphibians, notably Common Toad. Great Crested Newts are present in at least two sites; they also are a specially protected species under Schedule 5 of the Wildlife and Countryside Act.

The Lee Valley is known nationally for its angling, however the conservation significance of the non-introduced native fish populations is unclear. The Barbel populations are of national significance and the Tench is of local/regional significance.

Selection of habitat and species priorities in the Lee Valley Regional Park

Biodiversity: The UK Steering Group Report contains 14 habitat action plans and 116 species action plans. Within the next 2 to 3 years the Government will be preparing 16 more habitat and 286 more species plans. These are seen to be the national priorities for action.

In the light of the national process what approach should be taken to selecting priorities for a local biodiversity action plan and how do UK priorities relate to the local situation ?

Guidance in this process (*Evaluating priorities and setting targets for habitats and species - Guidance Note 4*) has been produced by the UK Local Issues Advisory Group on behalf of the UK Biodiversity Steering Group. The basic principle is that local biodiversity action plans should take a dual approach to setting priorities. They should concentrate both on the UK priorities that exist in the local area and should also look for additional local priorities. In this way the local plan should cover the total biodiversity of the area.

A three step process is suggested for selecting habitats and species priorities and conservation action:

1. Review of species and habitats.
2. Evaluation and prioritisation.
3. Preparation of action plans with local targets.

Review of species and habitats

For the review process a list of habitats and species of conservation concern should be drawn up for the plan area. This review needs to be based on the best information available which would usually include the most recent and accurate data. The review is likely to identify gaps in the information base, for example the lack of data on invertebrate groups.

For habitats, the review list should include:

- all the key habitats listed in the *UK Biodiversity Steering Group Report* which occur within the plan area; and
- habitats, not included in the above list, which are thought to be of local conservation concern, locally threatened, locally rare, locally distinctive/characteristic or locally popular.

For species, the review list should include:

- any species of UK priority, as identified in the *UK Biodiversity Steering Group Report*.
- all species in the local area that occur on the “long list” in the *UK Biodiversity Steering Group Report*
- additional species which meet the criteria but are currently not included on the list;
- other species neither on the long list nor meeting the UK criteria but which are of local concern, locally threatened, locally rare, locally distinctive/characteristic or locally popular; and
- species that have now disappeared from the local area so that consideration may be given to the chances of bringing them back.

Evaluation

The next step involves evaluating those habitats and species listed in the review process and to decide which are priorities for action in the Lee Valley. Criteria to be used in this evaluation process have been developed in the guidelines. Suggested criteria for habitats are:

- UK priority habitats and species, especially those most characteristic of the area.
- The significance of the local resource in the national context.
- The opportunity available to enhance the local resource and contribute towards national targets.
- Local decline rates and local rarity.
- Local threats to the habitat or species.
- The degree of habitat fragmentation and the viability of the remaining fragments.
- The importance of the habitat for key species.

- Local distinctiveness - habitats or species used to raise the profile of Local Biodiversity Action Plan work within the plan area.

These criteria are explained in detail in Table 1 (habitats) and Table 3 (species), and applied to evaluate the habitats and species of the Lee Valley in Table 2 (page 16) and Table 4 (pages 18-20) respectively.

Prioritisation

Evaluation of the habitats in Table 2 leads to the following priorities being identified:

1. Key habitats (as identified in the UK Steering Group Report) that are rare or declining and threatened locally and therefore must be a priority for action:

floodplain grazing marsh	reedbeds
fens, marsh and swamp	lowland hay meadow.

2. Key habitats of which there is a significant proportion in the local area and therefore deserve a special responsibility for maintenance:

standing open water.

3. Locally distinctive habitats which support priority species:

rivers and streams	urban.
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Evaluation of the species listed in Table 4 is complicated by the fact that a great deal more information is required on individual species distribution and abundance. At the present time perhaps only the birds have a reasonable level of data. This lack of data is therefore an issue in relevant parts of the action plans. On the current data the following priorities are identified.

1. UK priority species (short or middle lists) where the Lee Valley can contribute to achievement of the national targets:

Otter*	Skylark
Pipistrelle Bat	Crested Newt
Water Vole*	Shining Ramshorn Snail
Bittern*	

2. Species which are locally rare, declining, threatened and are either high profile or locally distinctive:

Linnet	White-legged Damselfly
Little Ringed Plover	Early Marsh Orchid*
Reed Bunting	River Water-dropwort
Snipe	Stream Water-crowfoot
Tree Sparrow	Kingfisher*

The asterisked species have been further selected for the first set of species action plans because of the level of threat and their high profile. The list above, and further action plans, will no doubt be reviewed as new information becomes available.

TABLE 1. HABITAT EVALUATION CRITERIA

A) Habitat Extent

UK Priority

Key habitat as identified in UK Steering Group Report.

Local decline rate

Rapidly declining	50 - 100% decline in habitat extent in BAP area in previous 25 years.
Declining	25 - 49% decline in previous 25 years.
Stable	24% increase - 24% decrease in previous 25 years.
Increasing	25 - 49% increase in habitat extent in BAP area in previous 25 years.
Rapidly increasing	50 - 100% increase in previous 25 years.

Proportion of UK habitat in local area

Significant	Local habitat forms 10 - 19% of total UK resource
Isolated	Local habitat is isolated from other areas of the same habitat

Local rarity

Rare	Habitat currently covers less than 0.6% of the total BAP area.
Scarce	Habitat currently covers 0.6 - 4.0% of the total BAP area.
Common	Habitat currently covers more than 4.0% of the total BAP area.

Local threat

Directly threatened	Habitats directly threatened by lack of or inappropriate management.
Indirectly threatened	Habitats indirectly threatened by generic factors (eg. recreation and pollution).

B) Habitat Quality

Degree of fragmentation/Restoration potential

Continuous (extendable)	Habitat continuous with potential for increase in area
Continuous (fixed area)	Habitat continuous with no potential for increase in area
Fragmented (extendable)	Habitat fragmented with potential for increase in area
Fragmented (fixed area)	Habitat fragmented with no potential for increase in area

Habitat important for key species

Key species	Habitat important for local BAP priority species
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Minimum viable size

Viable	Habitat above minimum viable size.
Potentially viable	Habitat currently below minimum viable size but with potential for increase in area.
Non-viable	Habitat below minimum viable size with no potential for increase.

Local distinctiveness

Distinctive	Habitat which is particularly associated with the local area (this may be a characteristic habitat or one of special historical/cultural importance).
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TABLE 2. EVALUATION OF HABITATS WITHIN THE LEE VALLEY REGIONAL PARK

Habitat	Extent criteria					Quality criteria				
	UK priority	Local decline	Proportion in local area	Local rarity	Local threat	Fragmentation	Key species	Viability	Local distinctiveness	
Rivers and streams		Stable		Scarce	Indirect	Continuous (fixed)	Key	Viable	Distinctive	
Standing open water (eutrophic) Canals	Key	Stable	Significant	Common	Direct and indirect	Continuous (extendable)	Key	Viable	Distinctive	
Floodplain grazing marsh	Key	Stable		Rare	Indirect	Continuous (fixed)		Viable		
Reedbeds	Key	Declining		Rare	Direct	Fragmented (fixed area)	Key	Potentially viable	Distinctive	
Wet woodland (carr)	Key	Stable		Rare	Direct	Fragmented (extendable)	Key	Potentially viable		
Fens, marsh and swamp	Key	Increasing		Rare	Direct and indirect	Fragmented (extendable)	Key	Viable		
Lowland hay meadow	Key	Declining		Scarce	Direct and indirect	Fragmented (fixed area)	Key	Potentially viable	Distinctive	
Improved grassland		Declining		Rare	Direct	Fragmented (fixed area)	Key	Viable	Distinctive	
Boundary features (ditches and hedges)		Stable		Common		Fragmented (extendable)		Viable		
Broadleaved woodland		Declining		Rare	Direct	Fragmented (extendable)		Potentially viable		
Arable		Stable		Scarce		Fragmented (extendable)		Viable		
Urban		Declining		Scarce		Fragmented (extendable)		Viable		
		Stable		Common	Direct	Fragmented (extendable)	Key	Viable	Distinctive	

TABLE 3. SPECIES EVALUATION CRITERIA

UK Priority

Short list	Species present on the UK Short list.
Middle list	Species present on the UK Middle list.
Long list	Species present on the UK Long list.
Additional	Species which meet the UK Long list criteria.

Local decline rate

Rapid decline	50 - 100% decline in numbers/range in BAP area over previous 25 years.
Decline	25 - 49% decline in numbers/range over previous 25 years
Static	24% increase - 24% decline in numbers/range in BAP area over previous 25 years.
Increase	25 - 49% increase in numbers/range in BAP area over previous 25 years.
Rapid increase	50 - 100% increase in numbers/range over previous 25 years.

Local rarity

Rare	Currently occurs on 0.60% or fewer tetrads in the BAP area.
Scarce	Currently occurs in 0.6- 4.0% of tetrads in the BAP area.
Common	Currently occurs in more than 4.0% of tetrads in the BAP area.
Extinct	Extinct in BAP area.

Local threat

Direct	Species with specific habitat requirements which are directly threatened by lack of or inappropriate management.
Indirect	Species threatened indirectly by human activities at the local level (eg recreation and pollution).

Position in geographical range

Localised	Local population forms 10-19% of the species UK population.
Isolated	Local population is isolated from other populations and is likely to contribute to genetic diversity of the species.
Outlying	Species is at the edge of its range in the BAP area.

Local distinctiveness

Flagship	Flagship species - high profile species which can be used to illustrate wider issues in the environment.
Keystone	Keystone species - ecologically important species which can be used as direct indicators of habitat quality.
Typical	Typical species - those species not necessarily identified as being of conservation concern, but which are particularly associated with, or characteristic of, the locality.

TABLE 4. EVALUATION OF SPECIES IN THE LEE VALLEY REGIONAL PARK

SPECIES	CRITERIA					
	UK priority	Local decline	Local rarity	Local threat	Position in range	Local distinctiveness
MAMMALS						
Brown Hare	Short list	Stable	Scarce	Indirect		
Brown long-eared Bat	Long list	?	Scarce	Indirect		
Badger	Long list	Increasing	Scarce			
Common Shrew	Long list	?	Common			
Daubenton's Bat	Long list	?	Scarce	Indirect		
Harvest Mouse	Long list	?	Common			Typical
Hedgehog	Long list	?	Common			
Leisler's Bat	Long list	?	Rare	Indirect		
Noctule	Long list	?	Scarce	Indirect		
Otter	Short list	Rapid decline	Scarce	Indirect	Outlying	Keystone
Pigmy Shrew	Long list	?	Common			
Pipistrelle Bat	Short list	Decline	Common	Indirect		
Serotine Bat	Long list	?	Scarce	Indirect		
Stoat	Long list	?	Common			
Water Vole	Short list	Rapid decline	Common	Indirect		Flagship
Water Shrew	Long list	?	?	Indirect		
Weasel	Long list	?	Common			
BIRDS						
Bittern	Short list	Static	Scarce	Direct	Outlying	Keystone
Black Redstart	Long list	Static	Scarce			
Black-necked Grebe	Long list	Static	Scarce			
Bullfinch	Middle list	Decline	Common	Indirect		
Common Tern	Long list	Increase	Common			Typical
Cormorant	Long list	Rapid increase	Common			Typical
Coot		Increase	Common			Typical
Corn Bunting	Middle list	Decline	Scarce	Indirect		
Cetti's Warbler	Long list	Static	Rare			
Gadwall	Long list	Increase	Common	Indirect		Typical
Grey Heron		Static	Common			Typical
Goosander	Long list	Static	Common	Indirect		Typical
Grey Partridge	Short list	Decline	Scarce	Indirect		
Grey Wagtail	Long list	Static	Common			
Great Crested Grebe		Static	Common			Typical
Gulls	Long list	Static	Common			Typical
Grasshopper Warbler	Long list	Decline	Scarce	Indirect		
Kingfisher	Long list	Static	Common			Flagship
Lapwing	Long list	Decline	Common	Indirect		
Linnnet	Middle list	Decline	Common	Indirect		
Long-eared Owl	Long list	Static	Scarce			Typical
Little Ringed Plover	Long list	Static	Common	Direct		Flagship
Meadow Pipit	Long list	Decline	Common			
Nightingale	Long list	Static	Scarce			Flagship
Pied Wagtail	Long list	Static	Common			

TABLE 4. EVALUATION OF SPECIES IN THE LEE VALLEY REGIONAL PARK

SPECIES	CRITERIA					
	UK priority	Local decline	Local rarity	Local threat	Position in range	Local distinctiveness
Pochard	Long list	Static	Common			Typical
Ringed Plover	Long list	Increase	Common			
Redshank	Long list	Decline	Common	Direct		Typical
Reed Warbler	Long list	Increase	Common			Typical
Reed Bunting	Middle list	Decline	Common	Indirect		Typical
Shoveler	Long list	Increase	Common	Indirect		Flagship
Skylark	Short list	Decline	Common	Direct		
Smew	Long list	Static	Common			Typical
Siskin		Static	Common			Typical
Snipe	Long list	Decline	Common	Direct		Keystone
Sand Martin	Long list	Decline	Common			Typical
Spotted Flycatcher	Middle list	Decline	Common			
Song Thrush	Short list	Static	Common			
Sedge Warbler	Long list	Static	Common			Typical
Tufted Duck	Long list	Static	Common			Typical
Tree Sparrow	Middle list	Decline	Scarce	Indirect		
Turtle Dove	Middle list	Decline	Common	Indirect		
Water Pipit		Increase	Scarce			Typical
Water Rail	Long list	Static	Common			Typical
Willow Tit	Long list	Decline	Scarce			Typical
Yellow Wagtail	Long list	Decline	Common			Typical
AMPHIBIANS AND REPTILES						
Great Crested Newt	Short list	?	?	Direct		Keystone
Common Toad	Long List	?	Common			
Common Frog	Long list	?	Common			
Smooth Newt	Long list	?	Common			
Grass Snake	Long List	?	Common			Typical
FISH						
Barbel		?	Common			Keystone
Bullhead	Long list	?	Common			Keystone
Tench		?	Common			Typical
INVERTEBRATES						
Dotted Fan-foot moth		?	Rare	Direct		
Small Heath		Decline	Rare		Isolated	
Essex Skipper butterfly		?	Common			Typical
Hairy Dragonfly		Increase	Scarce		Outlying	
Indolent Ant		?	?			
Musk Beetle		?	Common			Typical
Red-eyed Damselfly		?	Common			Typical
Ruddy Darter dragonfly		?	Common			
Shining Ramshorn snail	Short List	?	Rare	Indirect	Isolated	Keystone
White-legged Damselfly		Static	Scarce	Indirect		Keystone

TABLE 4. EVALUATION OF SPECIES IN THE LEE VALLEY REGIONAL PARK

SPECIES	CRITERIA					
	UK priority	Local decline	Local rarity	Local threat	Position in range	Local distinctiveness
PLANTS						
Black Poplar	?	Static	Rare	Direct	Isolated	Typical
Adders-tongue Fern		?	Rare			Typical
Flowering Rush		?	Common	Indirect		Typical
Marsh arrow-grass		?	Rare	Indirect	Isolated	Typical
Fan-leaved Water-crowfoot		?	Scarce	Indirect		Typical
Flat-stalked Pondweed		?	?	Indirect		
Golden Dock		?	Scarce	Direct		
Hemlock Water-dropwort		?	Common			
Ivy-leaved Water-crowfoot	Long list	?	Rare			
Knotted Clover		?	Scarce			Typical
Marsh Dock		Static	Common	Direct		Typical
Early Marsh Orchid		Increase	Scarce	Direct	Isolated	Flagship
Southern Marsh Orchid		Increase	Scarce	Direct		Flagship
Meadow-rue		?	Scarce			Typical
Meadow Saxifrage		?	Rare	Direct		Typical
River Water-dropwort	Long list	Decline	Rare	Direct		
Rue-leaved Saxifrage		?	Rare	Indirect		
Shining Pondweed		?	?	Indirect		
Stream Water-crowfoot	Long list	?	Scarce			Keystone
Slender Tufted Sedge		?	Scarce			Typical
Whorled Water-milfoil		?	Common	Indirect		

Species considered to be a priority for local action are emboldened.

3. VISION

The Lee Valley Regional Park Authority has recently prepared a draft Vision for the future development of the Park in the 21st century. It aims to express desirable characteristics of the Park and will be the basis on which to plan and develop the Park.

VISION

- i) To be a cohesive, sustainable and valued regional green lung.*
- ii) To be an area of enhanced and protected natural biodiversity for the enjoyment of all.*
- iii) To achieve full utilisation of the unique land and water assets of the Regional Park for specialist leisure and recreational facilities developed in accordance with principles of sustainability and design excellence.*
- iv) To be an accessible and permeable, integrated visitor attraction to serve the region which will include local communities.*

The Biodiversity Action Plan for the Lee Valley Regional Park sets out how the second of the above statements is to be achieved over the coming years. The Plan will also make a significant contribution to meeting all the other objectives. The targets and actions to maintain and enhance biodiversity should not be taken in isolation but should influence not only Park policy but the annual work programme of all sections of the Authority. However, before setting out the detailed targets and actions it is essential to be clear what the long-term ecological objectives for the Park should be. They take a holistic view of the Park's natural resource and look at least 25 years into the future.

LONG-TERM ECOLOGICAL OBJECTIVES

- i) To create, restore and link characteristic ecological, hydrological and landscape features to form a fully integrated river floodplain corridor.*
- ii) To realise the full ecological potential of the Lee Valley Regional Park by maintaining and enhancing the present range of species, habitats and landscape features combined with extensive re-creation and expansion of key habitat types.*
- iii) To achieve a sustainable use of the natural resource.*
- iv) To achieve awareness and understanding of the biodiversity the Lee Valley Regional Park and to encourage participation in its conservation.*

With knowledge of the key habitats and species within the Park and clarification of the long-term objectives for this natural resource, it is now possible to determine detailed targets and actions to meet these objectives. The first phase of this work will cover the

next ten years. Following national guidelines, this is set out within a series of habitat and species action plans. The habitat plans are considered to be the most important as habitats form the basic fabric within which all the species live. The rationale for selecting species for the preparation of action plans was discussed in section 2. However, those selected may be seen as 'flagships' for certain habitats, helping to define the distinctiveness of the Park and to promote a number of broader conservation issues.

4. HABITAT ACTION PLANS

4.1 RIVERS AND STREAMS

4.1.1 Current Status

Rivers and the corridors of land through which they flow are a major wildlife resource of critical importance to wetland habitats. Unconstrained rivers naturally meander with alternating pools and shallows. They spill onto floodplains and inundate habitats on a regular basis, allowing the development of wet grassland, marsh, swamp, fen and wet woodland. Rivers are therefore not only important for the wildlife they directly support within the channel but also for the critical influence they exert, from spring source to floodplain, on the plant communities of adjacent habitats. These natural functions can bring huge benefits to human society.

River classifications are based on geology, altitude, physical characteristics and plant communities. The River Lee is a lowland clay river, associated with low altitudinal sources, low gradient, base-rich water and fine/rich substrates. Typical plants include Arrowhead and Yellow Water-lily. The diversity of features found in rivers and streams supports a wide range of plants and animals including threatened species such as Otters and Water Voles. In-channel riffles (shallows) are spawning areas for fish, while gravel bars are important for specialised invertebrates such as some beetles and spiders. Eroding banks provide nesting sites for birds such as Kingfishers.

Key stretches of river habitat in the northern section of the Lee Valley Regional Park include the Amwell Magna backwater, Broxbourne Millstream, the River Lee from King's Weir to Waltham Abbey (Old River Lee), the Cornmill Stream and parts of the Lee between Enfield Lock and Lea Bridge Road. Further south the interlinked channels of the Lee, Old Lee and Lee Navigation south from Lea Bridge Road are all important in an urban context. These channels include the Bow Back Rivers (City Mill River, Bow Back River, Pudding Mill River and River Lea), the Limehouse Cut and Hertford Union Canal. In total at least 75 km of river channel exists within the Park, of which 23 km are considered to be of high nature conservation importance.

Plans 1 – 8 show existing rivers and streams within the Regional Park.

4.1.2 Current factors affecting the habitat

The rivers of lowland England have undergone many changes over the years, the majority of which are seen as detrimental to their ecology. Until recently, when remedial works by the National Rivers Authority (now The Environment Agency) have begun to restore natural river features, rivers have long been physically altered by straightening, deepening, widening or diverting, with corresponding decline in biodiversity. Over-abstraction of water can have serious effects on the amount of water in the channel in the summer months. Increased run-off of nutrients and silt can also occur where the river flows through agricultural areas, especially where these are ploughed to the river's edge.

The River Lee is very nutrient-rich. High levels of phosphates and nitrates originate both from agricultural sources and from effluent from major sewage treatment works at Luton and Rye Meads. These nutrients undoubtedly affect the ecological communities within rivers, side-streams, gravel pits and the adjacent wetland habitats.

The primary threats to rivers and streams in the Lee Valley Regional Park are currently considered to be as follows:

- Low water levels caused by over-abstraction of surface or groundwater, land drainage and flood defence works. Of particular importance in the Lee Valley Regional Park are the past flood defence works that have acted to separate the hydrological links between the river and the floodplain, thus reducing flooding of associated habitats.
- Pollution, notably over-enrichment by nutrients in the form of nitrate and phosphate. Not only does this affect the rivers themselves but also the open waters they feed and the suitability of the water for restoring water levels on adjacent land.
- Artificial structures, such as weirs, that restrict movement of plants and animals. However, such features also increase diversity in habitat.
- Inappropriate bank management.
- Excessive recreational use.
- The spread of invasive plants such as Giant Hogweed, Japanese Knotweed and Himalayan Balsam. However, the significance of the impact is debatable.

4.1.3 Current Action

4.1.3.1 Legal Status

The Cornmill Stream and Old River Lee at Waltham Abbey have been designated as a SSSI. Short sections of river channel included within other SSSI's, notably at Waltham Abbey Woods, Walthamstow Reservoirs and Chingford Reservoirs are included within the proposed Special Protection Area (SPA) under the EC Birds Directive.

The Environment Agency has a duty to further conservation under its water management functions, while the pollution control functions have a duty to have regard to the desirability of conserving and enhancing features of special interest. The Environment Agency also has a statutory duty to maintain, improve and develop fisheries. Water companies also have a statutory duty to further conservation where consistent with purposes of enactments relating to their functions.

4.1.3.2 Management, Research and Guidance

The National Rivers Authority (now The Environment Agency) has prepared Catchment Management Plans for the Lower and Middle Lee catchments which overlap the Lee Valley Regional Park. Over the next two years (1999 2000), two Local Environment Action Plans (LEAPs) are to be prepared for the catchment of the River Lea. It is important that these take full account of the objectives and actions of this Biodiversity Action Plan.

Water Level Management Plans are being prepared for wetland SSSI's in the Park. The Lee Valley Regional Park Authority is preparing a site management plan for the Cornmill Meadows (including the Cornmill Stream and Old River Lea) and is undertaking restorative work throughout the ditch and river channel system.

The Environment Agency has undertaken several river enhancement schemes, notably at the Amwell Magna backwater, the Cornmill Stream at Hooks Marsh and on the Small River Lea.

The Lower Lea Project are carrying out river corridor enhancement schemes in the Bow Back Rivers, River Lea and on parts of the Lee Navigation.

A working group established through the London's Waterway Partnership is examining water quality and flows from Field's Weir to the Thames. The group, comprising representatives from British Waterways, the Environment Agency and Thames Water will identify how flows can be increased, sweetening flows introduced, poor quality water diverted etc. Opportunities for enhancement work may be available via the Single Regeneration Bid programme, "Enhancing the Quality of the Water Corridor", European funding mechanism

4.1.4 Action Plan Objectives and Proposed Targets

- To maintain and enhance the quality of rivers and streams by achieving sympathetic and appropriate management of existing high value stretches while restoring degraded stretches. The target is to increase by 50% within 10 years the length of water course considered to be of high ecological value.

River stretches of high ecological value are defined as those reaching the relevant local designation for non-statutory sites of wildlife importance [Wildlife Site (Herts), Site of Importance for Nature Conservation (Essex) or Borough Significance (London)]. It is estimated that 23 out of a total of 75 km currently meet this criteria in the Lee Valley Regional Park, although this figure needs clarifying. The enhancement target is based on known stretches, close or adjacent to high quality stretches, that have the greatest potential for enhancement.

- To see improvement in water quality. The term "improvement" will need further definition. It may be seen as a reduction in pollution incidents or in specific

parameters such as the level of nitrate or phosphate. The objectives for water quality and channel structure are seen to require a parallel approach.

The achievement of objectives within this Rivers and Streams Action Plan runs very much in parallel with meeting the objectives of the Lower and Middle Lee Catchment Management Plans. These documents are crucial to the success of this plan. The CMPs are to be replaced by Local Environment Agency Plans (LEAPs). The upper Lea and the north London LEAPs are to be phased in during 1998-2000 and these initiatives will be of equal importance to the success of this plan.

Provisional stretches of rivers and streams targeted for enhancement are shown on plans 9 –16.

4.1.5 Proposed action with lead agencies

A full list of lead agency abbreviations is given in Appendix 1.

4.1.5.1 Policy and legislation

- RS1.** Set water quality objectives for all the channels of the River Lee (Lower Lee CMP action LL1). **Action: EA.**
- RS2.** Continue investment at Rye Meads STW to maintain effluent quality (Lower Lee CMP action LL12). **Action: TWUL.**
- RS3.** Assess whether the River Lee should be designated as a Eutrophic Sensitive area under the EC Urban Waste Water Directive (Lower Lee CMP actions LL118-119). **Action: EA.**
- RS4.** Continue to pursue all other water quality objectives within the Lower Lee CMP. **Action: EA.**
- RS5.** Seek to ensure that leisure provision on river channels within the Lee Valley Regional Park is environmentally sustainable through the implementation of a Water Management Strategy as part of the Park Plan Review. **Action: LVRPA, BW, Sports orgs, Cons orgs.**
- RS6** Support the designation of areas within the Regional Park as SSSIs where they meet the criteria for national importance for riverine species. **Action: EN, LVRPA.**
- RS7.** Review the need for a survey to assess water levels and flows in the catchments rivers, lakes and reservoirs during normal, low and peak flows in comparison to the range of existing and potential demands for water (Lower Lee CMP action LL62). **Action: EA.**

4.1.5.2 Site safeguard and management

- RS8.** Create a rolling programme of habitat improvement and diversification works for the next ten years, based on the EA River Corridor Survey (Lower Lee CMP action LL50). **Action: EA.**
- RS9.** Draw up Water Level Management Plans for all water related SSSI's by 2000 (Lower Lee CMP actions LL65-70). **Action: EA, EN, MAFF, LVRPA, TWUL, HMWT, RSPB.**
- RS10.** Review management plan for the Cornmill Meadows (incorporating Cornmill Stream and Old River Lee) by 2000 and implement actions. **Action: LVRPA.**
- RS11.** Review management of watercourses under LVRPA ownership within 2 years. Select at least 3 key stretches for bankside enhancements over 10 years. Those chosen should help expand and link existing high quality stretches. **Action: LVRPA.**

4.1.5.3 Future research and monitoring

- RS12.** Maintain water quality monitoring throughout the Lee Valley (incorporating Lower Lee CMP actions LL2,LL13). **Action: EA.**
- RS 13** Continue the Lower Lee Water Quality Study, a study and monitoring of causes of pollution in the River Lee and its tributaries (Lower Lee CMP action LL2). **Action: EA.**
- RS14.** Improve baseline data on rivers and their wildlife, thus enabling the impact of major redevelopment to be more accurately assessed (Lower Lee CMP actions LL96-99). **Action: EA, EN, LAs.**
- RS15.** Maintain dragonfly monitoring programme on the Cornmill Stream/Old River Lee with full survey at least every second year. Initiate dragonfly monitoring programme on another key stretch of river. **Action: LVRPA, BDS, NHS.**
- RS16.** Clarify and map the extent of water courses of high nature conservation value within 2 years. Identify degraded stretches and put into enhancement programme. Review every 5 years. **Action: LVRPA, EA.**

4.1.5.4 Communication and Publicity

- RS17.** To broaden public knowledge of the value of the water environment, the causes of poor water quality and how it affects rivers by carrying out publicity campaigns,

interpretative events and educational courses (incorporating Lower Lee CMP action LL10). **Action: EA, LVRPA, LAs, TWUL, Cons orgs.**

RS18. Ensure good communication between all groups active in the water environment in the Lee Valley Regional Park by holding meetings at least annually to discuss key issues (incorporating Lower Lee CMP actions LL58-61). **Action: EA, LVRPA, all interested parties.**

RS19. Maintain and promote the Dragonfly Sanctuary at the Cornmill Meadows, making use of its interpretative and educational opportunities. **Action: LVRPA.**

4.2 OPEN WATERS

4.2.1 Current Status

Open waters include all freshwater systems comprising standing water or waters lacking any dominant flow. They include natural systems such as lakes and pools, as well as those resulting from human activities such as gravel pits, reservoirs and ponds. Open waters are frequently classified according to their nutrient status; either oligotrophic (nutrient-poor), eutrophic (nutrient-rich) or mesotrophic (an intermediate). Eutrophic waters are naturally rich in plant nutrients and are typical of areas of lowland Britain such as the Lee Valley. These waters support large amounts of vegetation and a wide variety of animals. Many of them are important breeding and wintering sites for waterbirds such as Shoveler, Tufted Duck and Great Crested Grebe. Eutrophic waters are often clouded with abundant plankton; characteristic plants are duckweeds, lilies and pondweeds. The fish are largely coarse species such as Roach, Bream, Tench and Pike. The invertebrate fauna is diverse and includes snails and crustaceans. Eutrophic standing waters are listed as a key habitat in *Biodiversity: The UK Steering Group Report*.

Open water is one of the most extensive and significant habitat types in the Lee Valley. The wide range of open water in the Lee Valley includes ponds, sewage lagoons, isolated river backwaters and temporary flood pools but principally the huge areas of gravel pits and reservoirs. The total extent of open water is estimated to be around 1000 hectares. The huge storage reservoirs in the south of the valley make up about half (490 ha) of this total in just 3 major sites, while the one hundred or so gravel pits of various sizes north of Waltham Abbey comprise most of the remainder. The Lee Valley forms one of the largest complexes of open water habitats in England. The total gravel pit resource is estimated at 15,000 hectares nationally.

The existing extent of open water in the Regional Park is shown on plans 17 – 24.

4.2.2 Current factors affecting the habitat

The principal factors affecting standing open water habitats in the Lee Valley Regional Park are:

- Eutrophication caused primarily by nitrates or phosphates in sewage or fertiliser run-off.
- Conflicts between recreational activities and wildlife. In general intense use of open waters for recreational activities such as water sports or angling suppresses the wildlife value of the site.
- Natural succession to scrub and carr woodland around many gravel pits results in the loss of the plants and animals of early successional stages.
- Lack of management allowing natural succession to proceed.
- Poor or inappropriate management can lead to degradation of habitats, particularly the margin of open waters. This may be in the form of over zealous grass

management, bank erosion through over-use or inappropriate tree or margin management.

- Infilling of water-filled gravel pits with waste materials and refuse.

4.2.3 Current action

4.2.3.1 Legal Status

Rye Meads, Waltham Abbey Woods, the Chingford Reservoirs and Walthamstow Reservoirs are all included in the proposed Special Protection Area (SPA) under the EC Birds Directive. In addition, Turnford and Cheshunt Pits are designated as a SSSI.

The Environment Agency has a duty to further conservation under its water management functions, while its pollution control functions include a duty to have regard to the desirability of conserving and enhancing features of special interest. Water companies also have a statutory duty to further conservation where consistent with purposes of enactments relating to their functions.

4.2.3.2 Management, Research and Guidance

The National Rivers Authority (now The Environment Agency) has prepared Catchment Management Plans for the Middle and Lower Lee catchments.

The Lee Valley Regional Park Authority is currently preparing a Water Management Strategy which has the aim of providing a framework for the allocation of nature conservation and recreation uses for the open waters and rivers within the Park. Detailed land-use proposals will be put forward on the basis of this framework. Such a strategic approach to determining land-use on open waters in a way which minimises conflict between recreational interests and nature conservation has long been advocated.

There has been much research and guidance into the management of gravel pits for wildlife with many areas now set aside for nature conservation. In addition, new sites are increasingly being created in a way which benefits wildlife after-use.

At Amwell Gravel Pit, St Albans Sand and Gravel Company have been developing and managing a gravel pit nature reserve for the past 12 years. The open water habitats are of national significance for waterbirds and other wetland wildlife and the success of the site is widely acclaimed.

At Rye Meads the Herts and Middlesex Wildlife Trust, in partnership with St Albans Sand and Gravel Company, are enhancing the old gravel pits for wildlife benefit.

At Rye House Marsh the RSPB are managing 3 of the Rye Meads sewage treatment lagoons for the benefit of wetland birds.

At the River Lee Country Park the Lee Valley Regional Park Authority is preparing a site management plan.

At Walthamstow Reservoirs Thames Water Utilities Ltd are developing a site management plan which will bring significant benefits for wetland wildlife through the resculpturing of islands and creation of habitats.

4.2.4 Action Plan Objectives and proposed targets

- To achieve sympathetic and appropriate management of all key open waters of nature conservation importance with a minimum target of 35% of the total area of open water with nature conservation as the priority land-use.
- To establish formally within 5 years a series of high quality waterbird refuges (areas of minimal disturbance) capable of accommodating all waterbirds displaced by recreational activities at peak periods:

winter refuges totalling at least 400 hectares in 5 locations;

breeding refuges totalling at least 50 hectares in 10 locations; and

moulting refuges totalling at least 300 hectares in 3 locations.

The aim of these refuges is to maintain the existing waterbird populations of the valley as close to the maximum disturbance-free total as possible. The refuges will be based on a limited expansion of existing sites. Such refuges will need to be retained throughout the year not just at the time of the defined purpose.

- To ensure the following habitat types remain represented in the Lee Valley Regional Park at a level equal or greater than the current resource:

early successional wetlands with shallow water and bare mud/gravel: create a minimum of 5 hectares of appropriately managed habitat;

clear open waters with abundant submerged aquatic weed communities: maintain current sites; and

open waters with natural fish populations: formally establish a minimum of 3 sites (including both standing and flowing waters).

Provisional areas targeted for habitat enhancement or provision to meet targets are shown on plans 25 – 35.

4.2.5 Proposed action with lead agencies

4.2.5.1 Policy and legislation

- OW1.** Support SPA status for the SSSIs within the Lee Valley Regional Park which have been designated specifically for their wildfowl and wetland interest. Promote designation of the SPA during the re-consultation phase. **Action: EN, LVRPA, RSPB, All interested parties.**
- OW2.** Ensure that leisure provision on open waters within the Lee Valley Regional Park is environmentally sustainable through the implementation of a Water Management Strategy as part of the Park Plan Review. **Action: LVRPA, BW, Sports Orgs, Cons orgs.**
- OW3.** Draw up a proposed scheme of winter, breeding and moulting refuges within 2 years. Seek to “designate”. **Action: LVRPA, Cons orgs, TWUL, Landowners.**
- OW4** Support the designation of additional areas within the Regional Park as SSSIs where they meet the criteria for national significance for open water species. **Action: EN, LVRPA.**
- OW5.** Influence final design of any new open water in order to meet conservation or recreational needs in line with Water Management Strategy. **Action: LVRPA, Minerals.**
- OW6.** Establish a new forum bringing conservationists and recreationalists together to discuss progress of the Water Management Strategy. **Action: LVRPA.**
- OW7.** Initiate a working group of fish conservationists to bring forward proposals for fish conservation in the Lee Valley Regional Park, including the establishment of fish “refuges” with natural populations. **Action: LVRPA, Ang, Cons orgs, EA.**
- OW8.** Local authorities to recognise all sites of nature conservation importance within the Local Plan, update at Plan review. **Action: LAs.**

4.2.5.2 Site safeguard and management

- OW9.** Draw up management plans/statements for all open waters in the Lee Valley Regional Park with appropriate actions for nature conservation on each. Fishery objectives should be incorporated into these plans rather than forming separate plans. Achieve plans for 20% of waters annually, then revise 20% annually. **Action: LVRPA and other landowners/managers.**
- OW10.** Draw up and implement a programme of refuge enhancement, following designation and management plan preparation. **Action: LVRPA, Cons orgs, landowners/managers.**

OW11. Create a minimum of 5 hectares of early successional wetland habitat on at least 4 sites within 10 years. **Action: LVRPA, TWUL, landowners/managers.**

4.2.5.3 Advisory

OW12. Provide advice where required to mineral sites operators, leisure sites/managers and other appropriate landowners in order to maximise nature conservation potential within operational limits. **Action: LVRPA, Cons orgs.**

4.2.5.4 International

OW13. Establish the Lee Valley Regional Park as an example of good practice in wetland management on the international scene by seeking European funding to deliver targets within the action plan. **Action: LVRPA and partners.**

4.2.5.5 Future research and monitoring

OW14. Continue to support an integrated waterbird monitoring programme for the Lee Valley Regional Park as part of the established Wetland Bird Survey (WeBS). **Action: Cons orgs, LVRPA.**

OW15. Encourage recording and monitoring of wildlife of open waters. **Action: LVRPA, NHS, LRCs, Cons orgs.**

OW16. Seek to clarify and map the extent of open waters with rich submerged aquatic weed communities. Compile species lists. **Action: LVRPA, LRCs, NHS, Cons orgs.**

4.2.5.6 Communication and Publicity

OW17. To prepare interpretation for major waterbird refuges consistent with appropriate visitor management, within 2 years of sites being designated. **Action: LVRPA, TWUL, Cons orgs.**

OW18. Use the Lee Valley Conservation Group forum to exchange and disseminate information on open water habitats, their associated species and management. **Action: All interested parties.**

OW19. Issue regular press releases on progress with the open water action plan in the Lee Valley. **Action: LVRPA, Cons orgs.**

OW20. Develop educational courses and interpretative events on the topic of open waters and waterbirds. **Action: LVRPA, RSPB.**

4.3 FLOODPLAIN GRASSLAND AND FEN

4.3.1 Current Status

Fens, marshes and swamps consist of a range of similar habitats, all largely transitional between open water and dry land. Fens develop where water-logged conditions with a low oxygen concentration persist throughout the year, promoting the accumulation of organic matter and the formation of peat. The water supply is generally base-rich. Swamp is characterised by the water table at or above ground level for most of the year and has a relatively poor floral diversity. It is often dominated by a single species of tall fen vegetation, such as Common Reed, sedges or Greater Reedmace. Marshes form on mineral substrates where water levels are at, or close, to the soil surface in summer and rise above ground level in winter. Except for the permanently inundated swamps, most sites would have been grazed during the summer months to form fen meadows. The traditional 'Lammas meadows' were cut for hay in July and then grazed into the autumn. Fens and marshes can support a diversity of plant and animal communities. The best examples nationally can contain up to 550 plants, a third of the UK's native species, and up to half of our species of dragonflies. Reedswamps support a distinctive bird community, including the nationally threatened Bittern.

Wet grasslands are to be found where groundwater levels are close to, but not permanently at, the surface and where the grassland is affected by shallow seasonal flooding. Such sites are frequently inundated during winter and spring but can dry out considerably during the summer. Although there may be considerable overlap with fen meadows, wet grasslands tend to be floristically poorer, having a greater history of human intervention. They form the typically flat permanent grasslands of river valley floodplains, often with a network of water-filled ditches containing standing water. Management by grazing is the norm, with poaching of ditch margins by cattle creating and maintaining a habitat rich in plants and invertebrates. Both wet grasslands and fen meadows provide breeding habitat for wading birds such as Snipe and Redshank while winter floods can attract huge numbers of wildfowl.

Extensive long-standing areas of fen are scarce in the Lee Valley Regional Park but key areas of ancient fen meadow exist at Rye Meads, Silvermeade and Walthamstow Marshes. The total is about 65 hectares. Reedswamp is found as an integral part of the fen habitat at the previously mentioned sites and as fringing habitat at Cheshunt gravel pits. Many smaller fragments of such habitats are to be found scattered throughout the valley. About 5 hectares of reedswamp are to be found in larger blocks while the smaller fragments may double this total. Reedswamp is a scarce habitat nationally, with a UK total of around 5,000 hectares.

Wet grassland occurs at Cornmill Meadows and Sewardstone. Hall Marsh Scrape simulates this habitat. The total extent of wet grassland in the Lee Valley Regional Park is around 30 hectares, although only half of this is under appropriate management. This compares with the estimation of 200,000 hectares in England, mainly coastal. The valley also supports grassland of a much drier and more calcareous type, characterised by

species such as Cowslip, Wild carrot and Common Centaury. Fragments of such grasslands exist in the Turnford and Cheshunt Pits SSSI.

Existing areas of floodplain grassland and fen are shown on plans 33 – 40.

Reedbeds, fens, lowland hay meadow and floodplain grazing marsh are all listed as key habitats in *Biodiversity: The UK Steering Group Report*.

4.3.2 Current factors affecting the habitat

Losses of these habitats, both nationally and locally in the Lee Valley, have been significant over the last 50 years. In the Lee Valley the loss has principally been to mineral extraction, although conversely this has also created some limited habitat. Agricultural intensification was also previously a major factor, although largely superseded by mineral extraction. Landfill, and subsequent use for sports fields, is a significant feature in the south of the Park.

Some of the remaining unimproved sites are sensitive to increased nutrient loading. Unless conservation measures to retain these habitats are put in place, with particular emphasis on the maintenance of water levels, flooding regimes and appropriate grazing or cutting to contain natural succession, most sites will deteriorate.

The primary threats at present to floodplain grassland and fen in the Lee Valley Regional Park are:

- Low water levels, especially a lower incidence and duration of flooding, partly due to ecologically insensitive flood defence works constructed in the past.
- Over-enrichment by nutrients (eutrophication) usually as a result of run-off of nitrogen-rich agricultural fertilisers or phosphates in sewage effluent, resulting in changing plant communities.
- Neglect of traditional grazing or cutting management regimes, allowing natural succession to scrub woodland to proceed.
- Inappropriate management such as intensive cutting regimes or tree planting on grasslands.
- Increasing fragmentation of remaining high quality sites, making them less viable.

4.3.3 Current Action

4.3.3.1 Legal Status

Rye Meads, Cornmill Meadows and Walthamstow Marshes are designated as SSSI's. Rye Meads is additionally included within the proposed Special Protection Area (SPA) under the EC Birds Directive.

4.3.3.2 Management, Research and Guidance

All the SSSI sites are currently subject to Water Level Management Plans.

MAFF's Countryside Stewardship scheme offers incentive payments for sensitive management of waterside landscapes. Parts of Rye Meads, Silvermeade, Cornmill Meadows and Walthamstow Marshes are within the scheme.

Silvermeade is currently being restored by the LVRPA under Countryside Stewardship with assistance from the Environment Agency.

Rye Meads is currently being restored by the Herts and Middlesex Wildlife Trust, partly under English Nature's Reserve Enhancement Scheme. New reedbeds are being created at several locations in the Park, including Cheshunt Pits, Rye House and Rye Meads, by the LVRPA, EA, TWU, HMWT and the RSPB.

Walthamstow Marshes are currently being restored by the LVRPA under Countryside Stewardship with support from the Environment Agency.

The LVRPA is preparing a site management plan for the restoration of Cornmill Meadows, including the controlled flooding of grassland for wildlife benefit.

Hall Marsh Scrape is being managed by the LVRPA.

The Lee Valley Conservation Group has prepared *An Action Plan for Bitterns in the Lee Valley*, this document provides detailed guidance for the restoration and re-creation of reedbeds in the valley over the coming 10 years.

4.3.4 Action Plan Objectives and proposed targets

- To achieve sympathetic and appropriate management of all floodplain grassland and fen habitats of nature conservation importance within 5 years.
- To expand and enhance key areas under appropriate management to form extensive wetland habitat mosaics of at least 50 hectares in extent.

- To maintain the valley as a viable agricultural unit capable of continuing traditional low intensity grazing systems required to best manage characteristic floodplain grassland and fen habitats.
- To ensure the following habitat types remain represented within the Lee Valley Regional Park at a level equal or greater than the current resource and implementing restoration and re-creation programmes for the most threatened of habitats:
 - **Reedswamp:** increase from current maximum of 10 hectares to a total of 35 hectares within 5 years by creating 10 hectares at Rye Meads, 10 ha at Cheshunt/Fishers Green and a further 5 ha in smaller patches at other sites such as Amwell and Tottenham Marsh.
 - **Ancient fen meadows:** fully restore all the remaining resource.
 - **Wet grassland:** increase to a minimum of 30 hectares of managed wet grassland.
 - **Rough grassland:** maintain and enhance resource at current level

Provisional areas targeted for enhancement/creation of floodplain grassland and fen habitats are shown on plans 41 – 48.

4.3.5 Proposed action with lead agencies

4.3.5.1 Policy and legislation

- FG1.** Support SPA status for the SSSIs within the Lee Valley Regional Park which have been designated specifically for their wildfowl and wetland interest. Promote designation of the SPA during the re-consultation phase. **Action: EN, LVRPA, All interested parties.**
- FG2** Support the designation of additional areas within the Regional Park as SSSIs where they meet the criteria for national importance for floodplain grassland species. **Action: EN, LVRPA, All interested parties.**
- FG3.** Review management of Lee Valley Regional Park Farm with a view to incorporating nature conservation objectives into farm policy. **Action: LVRPA.**

4.3.5.2 Site safeguard and management

- FG3.** Prepare management plans/statements for all key floodplain grassland and fen sites within 5 years and revise in 5 years. **Action: LVRPA, HMWT, RSPB.**

- FG4.** Continue with planned creation of reedswamp at Rye Meads/Rye House Marsh over the next 5 years, increasing total area to a minimum of 20 hectares. **Action: HMWT, SASAG, RSPB, EA, TWUL.**
- FG5.** Review Rye Meads Management Plan every five years and seek to continue restoration of a mosaic of floodplain grassland, fen, wet woodland and open water habitats of at least 50 hectares. **Action: HMWT, RSPB, SASAG, LVRPA.**
- FG6.** Create new areas of reedswamp at Cheshunt/Fishers Green over the next 5 years, increasing total area to a minimum of 5 hectares. **Action: LVRPA.**
- FG7.** Expand existing area of reedswamp and fen at Amwell to a minimum of 1 hectare within 3 years. **Action: SASAG, Amwell cons vols.**
- FG8.** Seek to expand or create new areas of reedswamp at other sites, such as Tottenham Marshes, to reach a total of 7 hectares. **Action: LVRPA.**
- FG9.** Continue with planned restoration of Silvermeadee to form a mosaic of floodplain grassland and fen habitats. Prepare management plan within 2 years. **Action: LVRPA.**
- FG10.** Continue with planned restoration of Cornmill Meadows. **Action: LVRPA, EN, EA.**
- FG11.** Continue with planned restoration of Walthamstow Marshes. **Action: LVRPA, EN, EA.**
- FG12** Identify suitable blocks of land within the Regional Park for wet grassland and reedbed creation and target habitat creation/management initiatives to these areas. **Action:LVRPA, Conservation organisations.**

4.3.5.3 Advisory

- FG13.** Use the Lee Valley Conservation Group forum to exchange and disseminate information on floodplain grassland and fen habitats, their associated species and management. **Action: All.**
- FG14.** Set up training on the management of floodplain grassland and fen habitats using key sites in the Park, for Park staff, local conservation volunteers and other interested people. **Action: LVRPA, Cons orgs.**
- FG15** Provide advice where required to minerals site operators, leisure site managers and other appropriate landowners on the restoration, rehabilitation and management of mineral workings for reedbed habitat and lowland wet grassland. **Action: LVRPA, Conservation organisations.**

FG16 Promote Rye House Marsh and Rye Meads as a high profile demonstration site for reedbed creation and management. **Action: EA, TWU, HMWT, RSPB.**

4.3.5.4 Future research and monitoring

FG17. Seek to clarify and map the extent of all key floodplain grassland and fen habitats within 2 years. Compile species lists. Set up monitoring programme. **Action: LVRPA, LRCs, Cons orgs.**

FG18. Encourage recording and monitoring of wildlife, especially targeting poorly recorded groups. **Action: LVRPA, LRCs, Cons orgs.**

4.3.5.5 Communication and Publicity

FG19. Maintain a Bittern Watchpoint at Fishers Green . **Action: LVRPA, RSPB.**

FG20. Develop the interpretative potential of key floodplain grassland and fen sites (Rye Meads, Silvermeadee, Cornmill Meadows, Walthamstow Marshes). **Action: LVRPA, HMWT.**

FG21. Issue regular press releases on conservation progress in the Lee Valley Regional Park . **Action: LVRPA, Cons orgs.**

FG22. Develop educational courses on the topic of floodplain habitats in the Lee Valley. **Action: LVRPA, RSPB.**

4.4 WET WOODLAND

4.4.1 Current Status

The natural floodplain forest of willows, poplars, oak, ash and elms that once existed in our river valleys is now all but extinct. However, if natural succession in swamp, marshes or fens is allowed to continue unhindered, colonisation by shrubs and trees will occur to form a variety of woodland cover. Where the over-riding wetness of the ground remains the key environmental factor they are dominated by Alder or willow trees and as a group are often termed “carr” or “wet” woodlands. The floristic composition is determined by the degree of wetness, the nutrient status, the base-richness of the soils and past management. In general the best examples are a wet tangle of woody species, shade-tolerant herbs, mosses and ferns.

There is no estimate of the extent of wet woodland nationally although they are at best scattered or locally distributed. The best examples of species-rich communities are to be found in East Anglia. Wet woodlands are listed as a key habitat in *Biodiversity: The UK Steering Group Report*.

In the Lee Valley Regional Park wet woodland is now found extensively around old gravel workings where it usually rapidly succeeds the colonising marsh vegetation of the lake fringes. Larger areas are found developing on the old gravel washery silt fans. Due to its fringing nature the total extent of wet woodland in the Park is hard to quantify. However, extensive areas exist at Cheshunt, Turnford, Broxbourne, Rye Meads, Waltham Abbey and Sewardstone. The woodland of Waltham Abbey SSSI was originally a plantation primarily for the production of charcoal for gunpowder. Native species appropriate for the site, notably Alder, were planted. Some of the more neglected areas will soon be almost indistinguishable from the self-sown woodland around gravel pits. A single native Black Poplar, a nationally scarce tree, remains at Waltham Abbey. The total extent of wet woodland is likely to be in excess of 25 hectares.

The existing extent of wet woodland is shown on plans 49 – 56.

4.4.2 Current factors affecting the habitat

Wet woodlands of long standing are a scarce and declining resource. However, wet woodlands of more recent origin have increased locally, such as in the Lee Valley, following natural succession around old gravel workings. These habitats are mostly unmanaged but not greatly threatened by destruction. A minority are being managed for their timber, a process that destroys the typical wet woodland structure, an outcome that is also evident in some of those being managed for conservation, but with a mis-guided tidiness. The main threats probably are lower water levels and the continuing enrichment of water supplies.

The current factors affecting wet woodlands in the Lee Valley Regional Park are as follows:

- low water levels causing woodlands to become dryer and resulting in a change in species composition, for example resulting in the spread of Sycamore at Waltham Abbey SSSI.
- Inappropriate management, often in the form of woodland management that “tidies” and removes the natural structure (the jumble of fallen, rotting and growing trees). New planting may be of an inappropriate species mix for the local ecology.
- Nutrient enrichment, which modifies the vegetational community type.
- High levels of recreational use causing disturbance.
- *Phytophthora* fungal root disease of Alder.

4.4.3 Current action

4.4.3.1 Legal Status

Wet woodlands are an integral part of the Waltham Abbey Woods and Turnford and Cheshunt Pits SSSI's.

4.4.3.2 Management Research and Guidance

The Forestry Authority has recently produced a draft UK Forestry Standard, revised in the light of the Government's commitment to sustainable forestry given at the “Earth Summit” in Rio.

In Hertfordshire a revised Woodland Strategy has been prepared along with a Woodland Action Plan as part of the local biodiversity action plan.

4.4.4 Action Plan Objectives and proposed targets

- To achieve sympathetic and appropriate management of all key areas of wet woodland of nature conservation importance within 5 years
- To begin the re-creation of an area of woodland that resembles the lost floodplain forest
- To increase the total resource of wet woodland by around 20% to 30 hectares within 10 years.

Provisional areas targeted for enhancement or creation of wet woodland are shown on plans 57 – 64.

4.4.5 Proposed action with lead agencies

4.4.5.1 Policy and legislation

- WW1.** Develop a policy for all woodland management and planting in the Lee Valley Regional Park that takes account of the local distinctiveness and ecology, by 2002. **Action: LVRPA, EN.**
- WW2.** Seek Forestry Authority advice and grant aid for woodland management and development within the Lee Valley Regional Park. **Action: LVRPA.**
- WW3** Support the designation of additional areas within the Regional Park as SSSIs where they meet the criteria for national importance for wet woodland species. **Action: EN, LVRPA.**

4.4.5.2 Site safeguard and management

- WW4.** Prepare management plans/statements for all key wet woodlands within 5 years. **Action: LVRPA, Cons orgs.**
- WW5.** Ensure that all management plans consider the effects of public access on the site and include any appropriate actions. **Action: LVRPA, Cons orgs.**
- WW6.** Seek to retain as much of the wet woodland resource in the ex-MOD land south of Waltham Abbey as possible, especially where developed on naturally flooding low-lying silt lagoons. **Action: LVRPA, LAs.**
- WW7.** Ensure the retention of the sole remaining Black Poplar. Propagate cuttings in appropriate locations, record and monitor. **Action: LVRPA, HMWT, LRCs**
- WW8.** Develop new areas (ref: WW11) of wet woodland and manage appropriately. Increase resource by 1 hectare per every 2nd year. Only native and preferably local stock will be used in woodland planting. **Action: LVRPA, landowners/managers.**

4.4.5.3 Advisory

- WW9.** Initiate training for land managers in the ecology of wet woodlands. **Action: LVRPA.**

4.4.5.4 Future research and monitoring

- WW10.** Encourage recording of key species of wet woodland. **Action: LVRPA, NHS, LRCs.**

- WW11.** Seek to clarify and map the extent of wet woodlands in the Lee Valley Regional Park within 2 years. Compile species lists in order to identify key sites. Set up monitoring programme. **Action: LVRPA, LRCs, Cons orgs.**
- WW12.** Identify site(s) with the potential of supporting wet woodland where it does not conflict with more important habitats. In particular, research ways of re-creating woodland resembling the lost floodplain forest in areas where there is natural flooding and stream channel movement. **Action: LVRPA, EA, FA, Cons orgs.**
- WW13.** Monitor the spread of Phytophthora root disease. **Action: EA, LVRPA.**

4.4.5.5 Communication and Publicity

- WW14.** Use the Lee Valley Conservation Group forum to exchange and disseminate information on wet woodland habitats, their associated species and management. **Action: All interested parties.**
- WW15.** Promote the value of wet woodland habitats in appropriate publications. **Action: LVRPA.**
- WW16.** Develop a wet woodland demonstration site with appropriate interpretation and managed public access. Provide educational material. **Action: LVRPA, Cons orgs.**

4.5 URBAN HABITATS ACTION PLAN

4.5.1 Current Status

Urban habitats can be divided into a number of categories. These include:

1. **encapsulated countryside** - areas of semi-natural habitat which persist in the urban area from a more rural past;
2. **managed greenspace** - those areas managed for recreation or amenity such as gardens, parks, school grounds and roadside verges;
3. **naturally regenerating habitats and “urban commons”** - areas of disturbed ground or non-natural substrate which develop their own self seeded plant and animal communities; and
4. **urban wetlands** - urban rivers and watercourses, ponds and lakes.

The effect of human activity in the Lee Valley is such that most habitats could now be considered as urban. However, this plan will deal with areas of managed greenspace and the range of naturally regenerating post-industrial habitats which are so typical of the area. These are described below.

The power stations of the Lee Valley have left their legacies in the form of dumps of pulverised fuel ash (PFA), the residue remaining following the combustion of coal. This waste material was deposited in a number of locations along the valley floor. The unweathered PFA has a high Boron and salt content, a high PH and minimal nitrogen. It therefore forms a highly stressful environment for many plants. However the communities that develop are distinctive and notable. Initially bare, the PFA is usually covered with a swarm of marsh and spotted orchids after a few years, often with associated fen vegetation. This succeeds to carr woodland with glades of orchids.

A number of industrial buildings, some now redundant, form distinctive habitats. These vary from fern-covered crumbling remains of old water mills and weirs to both used and disused water treatment works. Currently operational treatment works attract large numbers of feeding birds while disused sites show vegetational succession through unusual substrates.

Naturally regenerating post-industrial habitats are frequent in the Lee Valley. Such sites, often seen as wasteland (in an economic, not an ecological sense), are colonised by a distinctive flora made up of a diverse selection of ruderals (such as arable weeds) and introduced species. The succession generally passes through tall grassland and scrub phases before, if allowed, secondary woodland takes over. This succession may however be slow on these nutrient-poor, dry and stressful habitats. Recent studies in several urban areas is demonstrating the great potential of these habitats for certain invertebrates.

The remaining PFA areas, totalling around 12 Ha in area, are at Cheshunt gravel pits, Sewardstone Marsh and Rye House Power Station (although the latter site is just outside the Park boundary). Currently operational sewage treatment works occur at Rye Meads,

Rammey Marsh (soon to be made redundant) and Deephams. Disused water treatment works occur at the Middlesex and Essex Filter Beds. Important brickworks occur at Waltham Abbey and Broxbourne. While remains of industrial sites occur throughout the valley most are to be found in the more urbanised south. Of particular note are the riverbank and canal towpath margins, which support an unusual and distinctive flora, and the restored land at Bully Point.

Associated species are many and varied. Of particular note on PFA are the swarms of Early Marsh, Southern Marsh and Common Spotted Orchids although many other species typical of marsh or fen habitats are to be found. Interesting invertebrate communities have been recorded on such habitats elsewhere but there is little data from the Lee Valley. The operational sewage treatment works provide feeding opportunities for large numbers of wagtails, finches and wading birds, while the disused Middlesex Filter Beds exhibit classical wetland succession in miniature, supporting several scarce wetland species for that area of London. Another urban wetland of note are the rich waterside communities of the “Paddock” at Tottenham. Old brickwork supports ferns and mosses while the monastic remains at Waltham Abbey host one of the few remaining local colonies of Rue-leaved Saxifrage. Old walls at Markfield Recreation ground support the nationally scarce wall Bedstraw and regionally scarce Rusty Black Fern. Post-industrial habitats in general support an interesting range and association of species, frequently with a high percentage of non-native species and hybrids. Commoner species include clovers, trefoils, plantains, bent grasses and Buddleia, scarcer introductions include Mexican Tea, Warty Cabbage, Sumatran Fleabane, Thorn-apple, Flax and Marijuana. Several of these are well established alongside canal towpaths in the south of the Park, including a colony of Greek Dock alongside the River Lee Navigation at Tottenham Marshes.

The extent of urban habitats of nature conservation importance will be assessed and mapped as part of this Action Plan (Action U8).

4.5.2 Current factors affecting the habitat

The main factors affecting urban habitats are:

- “improvement” or reclamation of naturally regenerating sites through the use of top soil and planting schemes;
- over-tidiness and simplification of management of urban parks/grasslands leaving less room for wildlife;
- infill development causing direct destruction of habitat; and
- pollution.
- dumping of rubbish and vandalism are aspects of the often negative public perception of many urban sites.

4.5.3 Current action

4.5.3.1 Legal Status

Some protection may be given to urban habitats if they are designated as Nature Reserves (such as Bully Point and the Middlesex Filter Beds). However, for the majority of urban sites protection comes from outside conservation legislation, notably through planning policies in local plans.

4.5.3.2 Management Research and Guidance

A number of grant aid schemes are aimed at enhancing urban wildlife habitats, especially where local communities are involved.

Urban habitats have considerable potential for local communities to take part in enjoyable activities which benefit nature conservation and enable them to take action for the local environment. The framework provided by Local Agenda 21 is appropriate and important.

Research into the use of social criteria in the evaluation of local wildlife sites that function as green links' into communities is being undertaken. Relevant criteria may include accessibility, availability of alternative sites, current use, aesthetic value, social value (range of users), physical value (walking, jogging, children's play, site management etc), educational value and sense of ownership.

The Lee Valley Regional Park Authority has considerable experience in managing urban habitats with examples of good practice at Middlesex Filter Beds and Bully Point. Other local examples include Old Ford Nature Reserve.

4.5.4 Action Plan Objectives and Proposed Targets

- To achieve sympathetic and appropriate management of all urban habitats of nature conservation significance within 5 years.
- To increase community involvement in managing urban habitats by establishing and supporting conservation volunteer groups.

4.5.5 Proposed action with lead agencies

4.5.5.1 Policy and legislation

- U1.** Devise and implement management policies for the various types of urban habitats.
Action: LVRPA, Cons orgs.

U2. Incorporate conservation objectives into the management of all managed greenspace, particularly amenity grasslands, parks and formally landscaped areas. **Action: LVRPA.**

U3. Work with appropriate agencies to devise appropriate evaluation guidelines for urban habitats. Ensure all identified urban habitats of conservation importance are included in local plans. Local plans should also recognise the importance of site linkages, green networks and wildlife corridors. **Action: LVRPA, LAs, LEU, Cons orgs.**

4.5.5.2 Site safeguard and management

U4. Prepare or review management plans/statements for all urban habitats of conservation importance within 3 years. Review every 5 years. **Action: LVRPA.**

U5. Continue management of PFA/orchid sites. **Action: LVRPA.**

U6. Continue management/development of Essex and Middlesex Filter Beds. **Action: LVRPA, Liaison group.**

4.5.5.3 Advisory

U7. Develop and use Lee Valley sites as examples of good practice in urban habitat management. **Action: LVRPA.**

4.5.5.4 Future research and monitoring

U8. Survey, evaluate and map all urban habitats of nature conservation importance within the Lee Valley Regional Park within 3 years. **Action: LVRPA, LNHS, LWT.**

U9. Encourage recording and studies of the wildlife of urban habitats in the Lee Valley. **Action: LVRPA, LRCs, NHS, Colleges.**

4.5.5.5 Communication and Publicity

U10. Establish a “Conservation work parties” focus group to oversee development and support of groups within the Lee Valley. **Action: LVRPA, BTCV, LNHS, Wildlife Trusts, LLP, Las, Countryside Management Service.**

U11. Expand and develop “events leaflet” to include practical conservation work parties in partnership with such groups. **Action: LVRPA, BTCV, LNHS, Wildlife Trusts, Cons vols.**

U12. Promote urban habitats as an educational resource and inform local communities about local wildlife in the context of the wider environment. **Action : LVRPA, LAs.**

U13. Use the Lee Valley Conservation Group forum to exchange and disseminate information on urban habitats, their associated species and management. **Action:**
All interested parties.

5. SPECIES ACTION PLANS

5.1 OTTER

(Based on a draft Otter action plan for Hertfordshire)

5.1.1 Introduction

As a 'top predator' the Otter *Lutra lutra* is naturally scarce and also highly sensitive to the health of the whole ecosystem that supports it. As such, the Otter is an important indicator species in riparian habitats. As recently as the 1950s it was widespread. However, a significant decline in numbers took place in the 1960s and 1970s, which was attributed to the use of persistent organochlorine pesticides, especially Dieldrin and Aldrin. While other factors are likely to have been involved, such as habitat loss, the detailed reasons for decline are not fully understood.

The Otter has high public appeal. Otter-related events generally attract much attention. The value of such an animal in raising awareness generally about nature conservation, and the water environment in particular, is considerable.

5.1.2 Current Status

National surveys showed an actual or effective extinction over most of the Midlands and south-eastern counties as numbers reached an all time low in the 1980s. Otters became extinct in Lee Valley in the early 1970s. Viable populations remained in Scotland, Wales and south-west England. This decline also occurred on the continent and the UK populations are one of the best left in Europe.

Recently there has been an encouraging expansion in range and (probably) numbers, notably from the south-west. However, expansion has been mainly from the regions least affected by decline, other areas such as Yorkshire and Northumberland have not shown the same trends.

The re-introduction of Otters to former haunts has also taken place in recent years, notably in East Anglia. In Hertfordshire 6 Otters were re-introduced to 2 sites (including one in the Lee Valley Regional Park) in 1991/92 by the Otter Trust. Their subsequent movements were monitored by the Wildlife Trust and the Herts Mammal Group. Currently it is known that these animals have bred at least once, at Rye Meads in 1995, and that Otters are still present along the valleys of the Stort and in the Lee Valley Regional Park from Ware down to Waltham Abbey.

5.1.3 Current factors causing loss or decline

Water quality. Pollution of water courses is thought to be a major issue. Polychlorinated biphenyls (PCB's) incorporate a wide range of substances which may act as pollutants.

The complex way they interact in the aquatic environment, and with Otters, is still poorly understood.

Insufficient food. Insufficient prey (low fish stocks) associated with poor water quality and poor river habitat quality may be appropriate in some areas.

Loss of habitat. Impoverished bankside features needed for breeding and resting, due to the continuing loss or degradation of wetland habitats, is likely to be a contributory factor.

Accidental death. Incidental mortality, primarily by road deaths but also by drowning in fish/eel traps, forms a significant issue in some areas.

5.1.4 Current action

The Otter is protected under the Wildlife and Countryside Act 1981 (Schedule 5) and is listed on Annexes 2a and 4a of the EC Habitats Directive, Appendix 2 of the Bern Convention and Appendix 1 of CITES.

The JNCC has prepared a "Framework for Otter Conservation in the UK 1995-2000".

National Surveys have been conducted at 5-7 year intervals and may be repeated in the future. Local surveys by Wildlife Trusts and others have established the present distribution and the potential for future spread.

Practical conservation management (eg river enhancement schemes, creation of logpiles and artificial holts) is in progress. Corporate responsibility for Otter Conservation and management has been accepted and acted upon by the Environment Agency - formerly the National Rivers Authority (NRA). In Hertfordshire, the NRA and BT supported an Otter Habitat Project from 1991-3 which surveyed river catchments in the county and drew up a priority list of river enhancement schemes.

Releases of captive bred Otters have successfully reinforced fragmented wild populations in East Anglia and Yorkshire, although success elsewhere is unproven and the whole issue of releasing Otters has become controversial. Research on the implications of heavy metal and PCB contamination in fish and the wider environment is in progress.

A draft Otter action plan has been prepared for Hertfordshire. Its objectives include achieving a viable local population within 10 years through a combination of species protection and habitat enhancement.

5.1.5 Action Plan Objectives

- To maintain the existing released Otters population thus supporting the wider objectives of achieving a viable population in Hertfordshire river catchments.
- To create a rolling programme of river enhancement schemes and incorporate action for Otters in all relevant local management plans.

5.1.6 Proposed Action

5.1.6.1 Policy and legislation

- 01.** Ensure all sites regularly used by Otters are recognised and protected in Local Plans of riparian boroughs. At the same time endeavour to strengthen river corridor policies where appropriate. **Action: LAs, LRCs, Wildlife Trusts.**
- 02.** Ensure adequate recognition of the nature conservation value of the valley, and particularly rivers and Otters, is included within the Lee Valley Regional Park Plan. **Action: LVRPA.**

5.1.6.2 Site safeguard and management

- 03.** Seek to include action for Otters in the Lower Lee Catchment Management Plans. This will include specific river enhancement projects including specific features for Otters. **Action: EA.**
- 04.** All management plans to consider the requirements of Otters and to implement actions if appropriate. **Action: Land managers.**

5.1.6.3 Species management and protection

- 05.** Attempt to reduce accidental deaths by identifying key sites for the provision of features such as road underpasses, Otter ramps or ledges under bridges, or similar. Present list to the Environment Agency for consideration. **Action: Wildlife Trusts, NHS, EA, Highway Authorities.**

5.1.6.4 Advisory

- 06.** Use the Lee Valley Conservation Group forum to exchange and disseminate information on Otters and river conservation. **Action: All interested parties.**
- 07.** All land managers operating within the Park to be aware of the requirements of Otters and the aims of this plan. Meeting/training seminars to be arranged as appropriate to keep up with new ideas/techniques. **Action: Land managers, EA, Wildlife Trusts.**

5.1.6.5 Future research and monitoring

- 08.** Monitoring of the movements of the released Otters to be continued in a co-ordinated manner. All records to be passed to the county mammal recorder. **Action: NHS, Wildlife Trusts, LRCs.**
- 09.** Collate information on prey productivity, biomass and pollutant levels and link to national research. **Action: UH, colleges, EA.**

O10. Study the diet of the released Otters. **Action: UH.**

5.1.6.6 Communications and publicity

O11. Progress reports on the released Otters to be sent at least once every 2 years to all interested parties. **Action: HMWT, NHS.**

O12. Use this popular species to publicise the importance of water quality and riparian habitats to biodiversity, through events, press releases and articles. **Action: LVRPA, EA, Wildlife Trusts.**

O13. Develop interpretative programmes and media to communicate Otter and river conservation to the public. **Action: LVRPA, EA, Wildlife Trusts.**

O14. Develop education courses for schools and colleges on the topic of river and Otter conservation. **Action: LVRPA.**

5.2 BITTERN

(Summary of plan prepared by the Lee Valley Conservation Group)

5.2.1 Introduction

Bitterns *Botaurus stellaris* are secretive birds which are confined almost entirely to lowland marshes dominated by Common Reed. They feed predominantly on fish (notably eels) but they also take a wide variety of other foods such as amphibians, insects, small birds and mammals. The males advertise their territories by a characteristic deep booming noise which allows the breeding population to be well known.

Up to the 17th century Bitterns were widespread throughout England but land drainage and hunting led to a steady decline. By the 1880s they were extinct as a breeding species in this country. They recolonized in the early 1900s. At that time there were estimated to have been around 80 booming males. Since then there has been a steady decline linked to the loss of suitable habitat.

In the winter the resident population is increased by the arrival of birds from the continent. The size of the influx is dependent on the severity of the weather but is never great. The total wintering population is generally less than 100 birds.

Nature conservation organisations have given a high priority to efforts to arrest and then reverse the decline. English Nature, the RSPB and others are putting a great deal of effort into managing existing breeding sites for Bitterns and the creation of new sites. The Lee Valley is particularly important for wintering Bitterns and has the potential to make a significant contribution to their conservation. It regularly supports 3 or 4 Bitterns throughout the winter and it could with appropriate management support breeding Bitterns.

5.2.2 Current Status

The total European population of Bitterns was estimated to be 2500-2700 pairs in 1976. There was a 30-50% decline after the 1978/79 winter. Bittern numbers appear to be declining in 17 countries, stable or fluctuating in 9, and increasing in only 3. In the UK the Bittern is a declining, localised and rare breeding species. Breeding pairs are confined almost entirely to lowland marshes in Norfolk, Suffolk and Lancashire. In 1996 there were only 22 booming males and by 1997 the total had dropped to 14. Numbers are boosted in winter by continental immigrants when between 50 and 100 birds are recorded each year.

Records published in the annual *London Bird Report* and *Birds of the Lee Valley* show that until the late 1960s the Bittern was an irregular visitor to the Lee Valley. During the 1970s between 1 and 2 birds wintered in the Lee Valley below Ware, with the same pattern during the 1980s.

Exceptions to this were extremely harsh winters such as 1978/79 and 1981/82 when 7 and 6 birds were recorded. Since 1991 the number of wintering Bitterns has increased with 4 or 5 birds present in recent winters, and 5 to 7 in 1995/96.

In recent years the majority of records have come from Rye Meads/Rye House Marsh and

Cheshunt gravel pits - particularly 70 Acres Lake where up to 4 birds have been present at one time. The largest areas of reedbed in the Lee Valley are at Rye Meads and one would expect this to be a favoured area. The birds feed extensively in the reed fringes of the sewage treatment lagoons and in ditches around the lagoons. During the day they roost in the larger reedbeds of the Herts and Middlesex Wildlife Trust nature reserve or the RSPB Rye House Marsh reserve.

5.2.3 Current factors causing loss or decline

Loss of habitat. The quantity of reedbed is declining. Surveys indicate only 5000 hectares of reed in the UK and only 53 sites greater than 20 ha. Increased awareness, conservation and protection in recent years has not stopped the decline. There has been a loss of 5-10% in England over the last decade and further losses are predicted. The main causes have been uncontrolled natural succession leading to drier habitats, conversion to grassland by grazing, and salt water incursion due to the failure of sea defences.

In the Lee Valley the situation is slightly different in that the major loss of reed is historical. In recent years small reedbeds have developed around wet gravel workings but these are now under threat. The total area of reedbed is only about 12 hectares.

Declining reedbed quality. The quality of reedbed is also declining. If Bitterns are indicators of reedbed quality, then 19 out of 30 sites nationally which have held Bitterns are no longer of sufficient quality. The principal cause appears to be natural vegetation succession leading to drier and /or more wooded habitat, and a lack of management to control it. Few of the reedbeds in the Lee Valley are in ideal management regimes.

Water quality. Water quality is also important. Eutrophication (high levels of nutrients) can cause reed die-back and problems of rehabilitation. High nitrate and phosphate cause the breakup and degeneration of floating reed-mats, and lead to anoxic (without oxygen) sediments which do not support food or reed colonisation. Algal blooms can decrease feeding efficiency because of turbidity (cloudiness) and direct fish kills. Pollution which contaminates their food may also contaminate Bitterns.

Other factors. Other factors which may affect Bitterns include hard weather, excessive water abstraction, persecution and egg collecting.

5.2.4 Current Action

Bitterns and reedbeds are given high priority for action within "Biodiversity: The UK Steering Group Report", which includes costed action plans for both.

English Nature has a Species Recovery Programme for Bitterns. Key actions are to improve the management of existing reedbeds and to encourage the creation of new, large reedbeds.

The RSPB has a species action plan for Bitterns and a habitat action plan for reedbeds.

The Lee Valley Conservation Group have prepared a Bittern Action Plan for the Lee Valley. The principal partners in this plan are the RSPB, the Lee Valley Regional Park Authority, The Wildlife Trust, English Nature, Thames Water Utilities and the Environment Agency. This Bittern action plan for the Lee Valley is a summary of the full plan.

5.2.5 Action Plan Objectives

To maintain all existing reedbeds by appropriate management.

To complete site management plans/statements for all reedbeds.

To produce at least 2 large reedbeds complexes by creating 10 ha at Cheshunt gravel pits and 10 ha at Rye Meads within 5 years.

To increase the number of small reedbeds by creating a total of at least 5 ha at other sites.

To increase the number of wintering Bitterns to 10 within 10 years.

To increase the number of regular wintering sites to 4 within 10 years.

To attract at least 1 booming male within the next 10 years.

5.2.6 Proposed Action

Policy and Legislation

- B1.** Support Special Protection Area status for the SSSIs within the Lee Valley Regional Park which have been designated specifically for their wildfowl and wetland interest. Promote designation of the SPA during the re-consultation phase. **Action: All interested parties.**
- B2.** Ensure adequate recognition of the nature conservation value of the valley, and particularly Bitterns and reedbeds, is included within the Lee Valley Regional Park Plan. **Action: LVRPA.**

Site safeguard and management

- B3.** Continue active management to maintain and enhance reedbeds in existing nature reserves at Rye Meads and Amwell, in a condition suitable for Bitterns. **Action: HMWT, RSPB, SASAG.**
- B4.** Continue active management to maintain and enhance reedbeds on Lee Valley Regional Park sites in a condition suitable for Bitterns. **Action: LVRPA.**
- B5.** Extend existing reedbeds wherever possible. **Action: All reedbed landowners/managers.**
- B6.** Create new reedbeds, particularly at Rye Meads and Cheshunt. **Action: EA, LVRPA, HMWT, RSPB.**
- B7.** Carry out an assessment of each existing reedbed to determine appropriate condition and management. There is a need to have drier reedbeds as well as the wet reedbeds preferred by Bitterns. An assessment should be carried out for each existing reedbed, the most appropriate condition for each decided, and management planned accordingly. **Action: LVCG.**
- B8.** Complete management plans/statements for all reedbeds. **Action: All reedbed managers.**

Advisory

- B9.** Use the Lee Valley Conservation Group forum to exchange and disseminate information on Bitterns and reedbeds. **Action: All interested parties.**
- B10.** Distribute the Lee Valley Bittern Action Plan report and updates to all relevant interest groups, landowners/managers, including statutory bodies, County Councils, District Councils, Parish Councils, LVRPA members and the Lee Valley Anglers Consortium. **Action: LVCG.**

Future research and monitoring

- B11.** Monitor and collate all records of Bitterns. **Action: LVCG, NHS.**
- B12.** Carry out research into the feeding ecology and habitat preferences of Bitterns in the Lee Valley. **Action: UH.**
- B13.** If it proves feasible, to colour-ring and radio-tag Bitterns in the Lee Valley, to investigate their movements and use of sites within the valley. **Action: RMRG.**

International

- B14.** Liaise with appropriate bodies on maintenance of summering habitat, if the origins of Bitterns wintering in the Lee Valley can be ascertained. **Action: RSPB.**

Communication and publicity

- B15.** Issue regular press releases on the progress of Bittern projects. **Action: RSPB, HMWT, LVRPA.**
- B16.** Maintain a Bittern Watch Point at Cheshunt pits as a joint LVRPA/RSPB project. **Action: LVRPA, RSPB.**
- B17.** Develop interpretative programmes and media to communicate reedbed and Bittern conservation to the public. **Action: RSPB, LVRPA.**
- B18.** Develop education courses for schools and colleges on the topic of Bitterns and reedbed conservation. **Action: RSPB, LVRPA.**

5.3 WATER VOLE

(Based on a plan prepared for Hertfordshire)

5.3.1 Introduction

The former widespread distribution and numbers of the Water Vole *Arvicola terrestris* has meant that it has attracted little or no conservation interest, but its accelerating decline in numbers and resulting fragmentation of its populations is of great concern.

The Water Vole is potentially an excellent indicator species whose presence reflects both healthy riverine habitats and plant communities. It is a well liked and familiar animal amongst the general public, and watercourse users in particular, as it is not overly sensitive to the presence of people and is easily seen during the day. This public profile presents opportunities to bring its plight to the attention of the public, to publicise the progress of its conservation, and to develop public participation.

5.3.2 Current Status

The Water Vole was once an abundant inhabitant of riparian (river corridor) habitats throughout Britain. Anecdotal reports suggesting that the Water Vole had undergone a considerable decline in both population numbers and distribution prompted an inquiry into its status in Britain. This initial investigation conducted by Jefferies et al (1989), concluded that the Water Vole had suffered long term decline in Britain, probably since at least 1900.

The work of Jefferies prompted a national survey in 1989/90 which failed to find signs of voles in 67% of sites which were previously documented as positive. In addition, Strachan (1993), concludes that the total loss of formally occupied water vole sites could be as high as 94% by the year 2000, making this the most dramatic population decline of any British mammal this century (Harris et al, 1995). In Hertfordshire, a Water Vole census was conducted by Louise Molloy in 1996. Results estimated that the percentage of positive sites has declined by 72.9% since 1989.

5.3.3 Current factors causing loss or decline

Fragmentation and isolation of habitats and populations. This is viewed as being perhaps the major factor of concern. Loss of wetland habitats has reduced Water Vole populations and left them more vulnerable to other threats, such as predation. Land drainage, low water levels, "river improvement" and changes in waterside management have all destroyed habitat. Intensive grazing and poaching by livestock along watercourses also contributes greatly to habitat loss.

Predation by Mink. Although it is now accepted that mink predation is a major threat to Water Voles there is still a great deal that is not understood about the interaction between the two species. It appears that the effect of mink predation is influenced and exacerbated by other threats such as habitat loss.

Disturbance of riparian habitats. In the past, the most significant form of disturbance was caused by channelisation and subsequent dredging operations as part of flood defence management. These modifications have had a drastic effect on Water Vole habitat; the destruction of burrows, emergent and in stream vegetation and the re-profiling of banks leaving them unsuitable for burrow formation. Fortunately these practices are now much less frequent. Other forms of disturbance are caused by the moorings of riverboats and by the activities of anglers when vegetation is removed and alterations to banks made.

Deterioration of water quality and reduction of flow. Water Voles are relatively tolerant of low water quality but the full impacts of differing types of pollution such as biocides are unknown. Low flows and droughts such as those caused by over-abstraction of groundwater can lead to the loss of Water Voles from the stretches of watercourses affected. By contrast, prolonged flooding can also be detrimental.

Rodenticides. The use of poisoned grain and similar rat and mouse poisons are not specific to mice and rats and will be taken by Water Vole when they are placed within their range.

5.3.3 Current action

Research funded by Oxford University and the Environment Agency, is now underway on the relationship between Mink and Water Voles, on movements and winter activity. The requirement of special dispensation from the DoE to release Mink after capture has been a problem in the study of population dynamics.

The Hertfordshire Mammal Group are carrying out ongoing investigations into the County status, habits and requirements of the Water Vole. Key Sites are being identified and monitoring being implemented.

5.3.4 Action Plan Objectives

- To maintain the current distribution and abundance of Water Voles in the Lee Valley.
- To facilitate recolonisation of past sites within 10 years through enhancement of existing habitat and populations.

5.3.5 Proposed action

Policy and Legislation

WV1. Key sites for Water Voles to be recognised in the Local Plans of riparian boroughs. **Action: LAs, Wildlife Trusts.**

WV2. Ensure adequate recognition of the nature conservation value of the valley, and particularly Water Voles and their habitats, is included within the Lee Valley Regional Park Plan. **Action: LVRPA.**

Site Safeguard and Management

WV3. All management plans to consider the requirements of Water Voles and to implement actions if appropriate. The strategic expansion of habitat from core areas will help to alleviate problems associated with fragmentation and isolation of populations. **Action: EA, all riparian landowners/managers.**

WV4. Channelisation and dredging should only be implemented in known Water Vole territories when absolutely unavoidable and under proper consultation. If necessary, both banks should not be effected simultaneously and small channels and side ditches should be left untouched. **Action: EA.**

WV5. Where unavoidable damage to habitat is done, remedial work such as re-planting vegetation along the waters edge and profiling banks to suit burrowing should be carried out to assist recolonisation. **Action: EA, landowners/managers.**

WV6. Where land is grazed, encourage landowners to prevent over-grazing and trampling damage to riverbank vegetation. Landowners to be encouraged to fence off river banks alongside or close to Water Vole sites. **Action: Landowners/managers, EA, Wildlife Trusts.**

WV7. Seek to include action for Water Voles in the Lower Lee Catchment Management Plans. This will include specific river enhancement projects including specific features for Water Voles. **Action: EA.**

Species Management and Protection

WV8. Seek to avoid the use of rodenticides in areas supporting Water Voles. **Action: LAs, all relevant parties.**

Advisory

WV9. All relevant watercourse managers should be made aware of the conservation requirements of the Water Vole. The provision of correct advice and information to be part of ongoing training. **Action: Wildlife Trusts, EA, Landowners/managers.**

WV10. Use the Lee Valley Conservation Group forum to exchange and disseminate information on Water Voles and their habitats. **Action: All interested parties.**

Future Research and Monitoring

- WV11.** Carry out regular surveys for the presence of Water Vole and Mink to provide a complete picture of the distribution of the species throughout the valley, to identify key sites and to provide a baseline for future monitoring. **Action: Wildlife Trusts, NHS.**
- WV12.** Seek opportunities to participate in further research to identify the full ecological requirements of the Water Vole in the region. **Action:UH, NHS, Wildlife Trusts.**
- WV13.** Establish a Water Vole monitoring project with angling clubs. **Action: LVCG.**

Communications and Publicity

- WV14.** Use this popular species to publicise the importance of water quality and riparian habitats to biodiversity, through events, press releases and articles. **Action: LVRPA, Wildlife Trusts, EA.**
- WV15.** Develop interpretative programmes and media to communicate Water Vole and river conservation to the public. **Action: LVRPA, Wildlife Trusts, EA.**

5.4 EARLY MARSH ORCHID

5.4.1 Introduction

The Early Marsh Orchid *Dactylorhiza incarnata* is a plant of wet or damp habitats, usually always on calcareous or neutral soils. It is usually found in wet meadows, fens, marshes and by the sea in dune systems. It has declined sharply in many areas of its range, mainly because of the decline in its favoured habitats. However, in the Lee Valley and a few other places, colonies of Early Marsh Orchids, along with Southern Marsh and Common Spotted Orchids have become established on areas of dumped Pulverised Fuel Ash (PFA), a waste product from coal burning power stations. Of special interest is the formation of “hybrid swarms” between the 3 species, exhibiting a wide range of hybrid features.

In the Lee Valley these colonies are large and of high aesthetic appeal at time of flowering. The habitats developing on PFA substrates are increasingly recognised as being important for a number of species, including orchids and invertebrates in particular.

5.4.2 Current Status

In the London area, the Lee Valley is now the only known site for this plant. It has disappeared from all its natural habitats. In Hertfordshire it has always been a rare plant of calcareous marshes. It now survives on 2 or 3 such sites.

In the Lee Valley it is known from 5 sites, all on dumped PFA. At Cheshunt the population still numbers in thousands although at other sites the colonisation of the PFA by a woodland of birch and willow is shading out the orchids and has caused a decline in numbers. Orchids were formerly recorded at the southern end of the ex-RARDE site at Waltham Abbey. They were lost due to habitat succession to woodland and the SSSI at this site was subsequently denotified.

5.4.3 Current factors causing loss or decline

Natural succession. Natural succession to birch and willow woodland is occurring on all sites. Although some forms of orchids appear to be linked with the scrub margins, the increasing shading will in time reduce populations. In some areas orchids have now died out.

Lack of management. The issue of lack of management is clearly linked to natural succession. This is an issue on some sites only, on others habitat management is being carried out but further clarification of the type and timing of management may be necessary.

Theft. The digging up of certain distinctive colour forms or variations has occurred in recent years.

Other factors. It is unknown if other factors are causing decline but issues such as changing nutrient status of the PFA, competition from rank vegetation or decline in water levels may be involved. Further study is required.

5.4.4 Current action

At Cheshunt gravel pit in the River Lee Country Park the largest colony of orchids has been monitored over a number of years. A boardwalk and interpretative sign have been installed to increase visitors enjoyment while protecting the plants from trampling. Scrub management is being carried out.

At Sewardstone the Countryside Service has carried out limited removal of willow scrub that has developed over the orchid colony. Numbers of plants have not increased.

At Amwell gravel pit orchids were introduced to a specially created area of dumped PFA. After an early decline numbers of orchids have steadily increased. The area is now grazed by cattle. This has kept the area free from rank growth and scrub encroachment but has resulted in the loss of some flower spikes.

A large colony occurs at Rye House Power Station, just outside the Park boundary but within the valley. The site has seen considerable change in recent years with the building of a new gas turbine power station. A small amount of habitat management has been carried out by the Herts and Middlesex Wildlife Trust in partnership with National Grid.

5.4.5 Action Plan Objectives

- To retain viable populations of Early Marsh Orchids at all presently known locations.
- To increase the population sizes of threatened colonies.

5.4.6 Proposed Action

Policy and legislation

EM1. Ensure adequate recognition of the nature conservation value of the valley, including Early Marsh Orchids and PFA substrates, is included within the Lee Valley Regional Park Plan. **Action: LVRPA.**

Site safeguard and management

EM2. Prepare and implement management plans for all Early Marsh Orchid sites within 3 years. **Action: LVRPA, SASAG.**

EM3. Develop a range of co-ordinated trial management techniques on different sites eg PFA rotavation, turf-stripping, scrub removal, grazing and monitor to ascertain most beneficial long term management option. **Action: LVRPA, LVCG.**

- EM4.** Implement measures to protect orchids at Amwell from grazing. **Action: SASAG.**
- EM5.** Seek agreement with National Grid and Powergen at Rye House Power Station to ensure long term management of the orchid colonies within their land holdings. **Action: LVCG, NG, Pow.**
- EM6.** Explore the re-establishment of Early Marsh Orchids at Waltham Abbey if PFA substrates are retained following decontamination and redevelopment of the site. **Action: LVRPA.**

Advisory

- EM7.** Use the Lee Valley Conservation Group forum to exchange and disseminate information on orchids, PFA substrates and management techniques. **Action: All interested parties.**

Future research and monitoring

- EM8.** Monitor and collate annual performance of all colonies. **Action: LVCG, NHS, LVRPA.**
- EM9.** Encourage continuing research into the ecology of PFA substrates and in particular the ecology of the orchid colonies that develop on them. **Action: LVRPA, LVCG.**
- EM10.** Encourage the involvement of local botanists and natural history societies in the recording and monitoring of orchid colonies. Ensure all data is passed to the appropriate local records centre. **Action: LVCG, NHS, LRCs.**
- EM11.** Seek information from similar habitats elsewhere in the UK. **Action: LVRPA, LVCG.**

Communication and publicity

- EM12.** Maintain a high profile for orchids in interpretative programmes. **Action: LVRPA.**
- EM13.** Seek appropriate publicity in newspapers, journals etc. **Action: LVRPA, LVCG.**

5.5 KINGFISHER

5.5.1 Introduction

The Kingfisher *Alcedo atthis*, is a bird of shallow and slow moving water. They feed on small fish, caught by spectacular dives. They make their dives from perches above the water such as tree branches. They nest in a burrow which is normally excavated into a soft vertical bank. Although frustratingly difficult to observe, in spite of their brilliant blue plumage, they often betray their presence by a loud piping call.

Kingfishers are excellent indicators of the quality of their wetland habitats. Their prey is very susceptible to water pollution and therefore those water bodies which do not support small fish populations will also be devoid of Kingfishers. In recent times pollution by both industrial and agricultural waste has resulted in loss of Kingfishers from a number of potentially suitable waterbodies.

Dependent as they are on shallow waterbodies, Kingfishers are susceptible to the effects of harsh winters, when many birds will starve, unable to gain access to their principal food source because of ice. Fortunately Kingfishers are prodigious breeders, with up to four broods of up to six young produced each year. As a result of this, numbers can fluctuate widely from year to year.

5.5.2 Current Status

Kingfisher is included on the “amber” list of species of conservation concern in Britain, having an unfavourable conservation status in Europe. It is protected through its listing on Schedule 1 of the 1981 Wildlife and Countryside Act. It is also protected under Annex 1 of the EC Wild Birds Directive (79/409/EEC). The British population of Kingfishers was estimated in 1991 to be between 3,300 – 5,500 pairs. In the Lee Valley the population is static but with a concentration in the northern half of the Park where wetland habitats are widespread as a result of gravel extraction. The south of the Park contains numerous watercourses but many of these have been degraded due to industrial and commercial development and correspondingly, the Kingfisher is not as numerous as it might be.

5.5.3 Current factors causing loss or decline

Deterioration in water quality/loss of prey.

It has been suggested that a deterioration of the water quality in some water courses within the Regional Park has resulted in a reduction or loss of small fish populations on which Kingfishers are reliant.

Occasional pollution incidents may also result in fish kills, thus removing the Kingfisher’s food source on isolated watercourses.

Fragmentation and isolation of habitats

In the south of the Regional Park water courses are often isolated from one another by main roads and urban development. Movement between watercourses therefore involves risks, particularly if birds have to negotiate busy roads.

Loss of nesting habitat

For breeding, Kingfishers rely primarily on vertical natural banks into which they can excavate their nesting burrow. Actively eroding river banks provide the ideal habitat for nesting Kingfishers as new bare faces are exposed regularly. Few stretches of river in the Regional Park retain features associated with a natural river system. In particular, the natural meandering of river channels where active erosion takes place, have been lost from all but a few sites.

Natural succession also results in banks becoming unsuitable for nesting. Vegetation develops preventing Kingfishers from burrowing into the bank.

Development and straightening of river channels results in the direct loss of nesting habitat.

Deterioration of riparian habitats

Degradation of riparian habitats can result in loss of prey items. Removal of aquatic habitats will prevent the development and maintenance of fish populations. Development or re-grading of banks may remove perches from which Kingfishers hunt.

Dry summers and reduced recharge of water courses can lead to a deterioration in water quality and therefore an effect on the birds food items. Lowered water levels below nesting burrows makes them and young more susceptible to predation.

Disturbance of riparian habitats

Constant disturbance of riparian habitats will result in Kingfishers deserting potentially suitable watercourses, particularly during the breeding season. This in turn may cause birds to use sub-optimal habitats or compete with other birds for suitable habitat.

5.5.4 Current Action

Distribution and population of the Kingfisher in the Regional Park is monitored via the Wetland Bird Survey (WeBS).

Habitat management and creation for the Kingfisher has been carried out on an ad-hoc basis throughout the Park. Of particular note is the creation of an artificial nesting bank for Kingfishers at Rye House Marsh RSPB Nature Reserve. Since its creation it has been used successfully and numerous young have been fledged from burrows in this bank.

5.5.5 Action Plan Objectives

- To maintain the current population and range of Kingfishers in the Regional Park.
- To facilitate the colonisation of new water bodies and courses through the enhancement and creation of suitable riparian habitats.

5.5.6 Proposed Action

Policy and Legislation

- K1** Key sites and habitats suitable for Kingfishers should be recognised and protected in the Local Plans of the riparian boroughs. **Action: LA's, Wildlife Trusts.**
- K2** Ensure adequate recognition of the nature conservation value of the Regional Park, Kingfishers and their habitats within the Lee Valley Regional Park Plan. **Action: LVRPA.**

Site safeguard and management

- K3** Continue to manage existing sites to ensure habitats remain suitable for Kingfishers. **Action: LVRPA, HMWT, RSPB, EA, BW.**
- K4** Identify waterbodies currently unused, but suitable for Kingfishers and where appropriate enhance the habitat by, for example creating nesting cliffs and perches. **Action: LVRPA, EA, BW.**
- K5** Prepare and implement management plans for all waterbodies and courses, taking account of the needs of Kingfishers. **Action: LVRPA, HMWT, RSPB, BW, TW.**
- K6** Maintain and if possible improve water quality within all waterbodies and courses within the Regional Park in line with the relevant Catchment Management Plans. **Action: EA.**

Advisory

- K7** Use the Lee Valley Conservation Group forum/Biodiversity Steering Group to exchange and disseminate information on Kingfishers and their ecology. **Action: All interested parties.**
- K8** Provide a point of contact within the Regional Park for landowners who want advice on the conservation of Kingfishers and their habitats. **Action: LVRPA.**

Future research and monitoring

- K9** Continue to monitor and collate all records of Kingfishers, including breeding sites. **Action: LVCG, NHS, LVRPA, via WeBS.**
- K10** Carry out habitat surveys of all water bodies and courses and identify those water courses for which it would be appropriate to target habitat enhancement/creation for Kingfishers. **Action: Wildlife Trusts, UH, NHS, LVRPA, EA.**
- K11** Monitor aquatic habitats and water quality in all water bodies. **Action: EA.**

Communications and publicity

- K12** Use this attractive and popular species to publicise the importance of water quality and wetland habitats to biodiversity, through events, press releases and articles. **Action: LVRPA, Wildlife Trusts, EA, RSPB.**
- K13** Develop interpretative programmes and media to communicate Kingfisher and wetland conservation to the public. **Action: LVRPA, Wildlife Trusts, RSPB, EA.**
- K14** Develop a Kingfisher Watchpoint with interpretative material to highlight the link of the presence of Kingfishers with the quality of wetland habitats. **Action: LVRPA, RSPB.**

6. COMMUNITY INVOLVEMENT AND PARTNERSHIPS

6.1 Introduction

The Agenda 21 process that originated at the Rio "Earth Summit" is underpinned by the basic philosophy that we must all live our lives in such a way that future generations, our children and their children, are not cheated of a future healthy environment. This is the basis of sustainable development. We must stop polluting our environment, stop wasting our natural resources and stop destroying our diversity of wildlife.

The need to involve people in the decisions that affect the environment has never been greater. The important role of local communities in bringing about the fundamental changes necessary to achieve a healthy environment is stressed in Agenda 21. Local authorities were charged with entering into a dialogue with local communities and producing a Local Agenda 21 for their own area by 1996.

The conservation of biodiversity is an integral part of the Agenda 21 process. The introduction to Chapter 15 of Agenda 21 reads as follows:

'our planet's goods and services depend on the variety and variability of genes, species, populations and ecosystems. Biological resources feed and clothe us and provide housing, medicines and spiritual nourishment'.

6.2 Local community involvement

Agenda 21 stresses that it is important that local communities are actively involved in looking after their environment. The Lee Valley Regional Park has a major role to play in this process. The future development of the Park in a sustainable manner should be used as an imaginative vehicle to develop closer links between the local environment and the local community in order to promote wider understanding and to raise awareness. Interpretation and education are crucial to this process.

Community groups can be very important and influential in nature conservation and environmental issues in general. The majority are volunteer based and although often limited in time and resources, a high level of commitment can often be achieved. Appropriate support can increase the effectiveness substantially. Local communities can benefit environmental projects in many ways: local knowledge and expertise, involvement in practical work and increased communication. Community groups mainly split into two types; those with direct practical involvement in nature conservation and those with a wider interest in the environment and use of the Park. Both need to be linked into the discussion process and kept informed of new initiatives.

Local community involvement in nature conservation within the Lee Valley Regional Park is currently low. Existing groups are mainly site specific. Most are involved in practical site management. In the south of the Park the Countryside Service of the Lee Valley Regional Park co-ordinates a successful volunteer group at Lea Bridge Road and The

Lower Lee Project is also very active. At Rye Meads the Herts and Middlesex Wildlife Trust and the RSPB both organise regular work parties. At Amwell gravel pit most of the habitat management is undertaken by a long-standing group of volunteers. Epping Forest Countrycare and Hertfordshire's Countryside Management Service both work extensively with volunteers on the margins of the Park and the important countryside links into the surrounding areas.

Other groups have a wider remit. For example, the Lee Valley Conservation Group provides a forum for local organisations with an interest in nature conservation to discuss current issues and it also acts as a vehicle for information exchange.

There will be many benefits from an increased sense of ownership in local projects. Links with local communities need to be strengthened and the range of opportunities for involvement need to be expanded. There is the potential for the existing "providers" to work much more in partnership. Such partnerships can be particularly effective at implementing change. Initiatives such as a seasonal events diary of tasks throughout the Park, training for volunteers in tool use or habitat management and perhaps a tool loan facility, may be a way to encourage greater involvement and the establishment of more local groups.

6.3 Key partners in industry

It is widely agreed that environmental concern must not be the prerogative of conservationists alone. The report of the UK Biodiversity Steering Group states the importance of developing partnerships that involve those beyond the normal range of conservation organisations. Private sector industry is one such important group.

The private sector is increasingly becoming more aware of its effect on the environment and how environmental performance affects business. "Green business groups" are expanding and the value of high environmental standards is more widely known. Mechanisms and funding for environmental audits of private sector businesses and local authorities are increasingly seen as a priority.

The Lee Valley has a huge number of businesses both large and small around its boundaries. Some, such as Thames Water and the aggregate industry are actively involved within the Park. All businesses can contribute to improving the environment in a number of ways. This includes ensuring any plans for development take environmental issues into account, taking opportunities for environmental enhancement on land holdings and providing skills, services or staff to help local groups.

6.4 Taking partnerships forward

The value of forming partnerships to take forward biodiversity conservation in the Lee Valley must be clear. Initial discussions have raised a number of key points:

1. There is a need for an overall steering group to monitor progress, co-ordinate actions and disseminate information.

2. All sections of the community, including local groups and commerce need to be engaged in the process.
3. Whilst there is a need to link with Local Authority Local Agenda 21 initiatives, the setting up of undue beaurocracy should be avoided.
4. The resourcing of the system requires consideration.

It is suggested that an overall steering group (The Lee Valley Biodiversity Steering Group) be established. This group should be made up of officers from the Park Authority, Local Authorities, conservation groups, the Environment Agency and other key partners, including industry. The steering group should establish a number of focus groups that feed upwards. These could include a green business group, local community or Local Agenda 21 groups, a resources group, a monitoring group and a volunteers group. Such a setup will require a considerable amount of time and resources itself and one option for partners may be the financing of a biodiversity officer to take the plan forward.

6.5 Objectives

- To maximise opportunities for local community involvement in environmental issues by raising awareness through interpretative, educational and cultural initiatives.
- To seek partnerships with other authorities and commerce in order to promote and support environmental initiatives.
- To seek partnerships with voluntary nature conservation organisations, particularly to support conservation volunteer groups.
- To increase community involvement in managing habitats by establishing and supporting conservation volunteer groups.

6.6 Proposed action

- C1.** Establish a Lee Valley Biodiversity Steering Group and focus group structure in order to develop wide ranging partnerships, including the active participation of local communities, business and industries, as a way of implementing the Biodiversity Action Plan. **Action: LVRPA.**

7. MONITORING AND REVIEW

7.1 Introduction

The monitoring and review of the final plan is one of the most critical of actions. To ensure that targets detailed within the individual habitat and species action plans are met it is essential that adequate resources are allocated to recording and monitoring.

However, at the present time there is still a need to further define and measure the biological resource of the Lee Valley Regional Park. The lack of data is particularly evident when trying to evaluate the key species within the area. Although this lack of data is not felt to be a reason for delaying the Biodiversity Action Plan process, as habitats and species continue to decline, it is essential that actions to try and fill the gaps in our knowledge are implemented. This will allow more critical ongoing revision of the plan.

The need to develop partnerships is particularly clear when considering recording and monitoring. A great deal of knowledge and expertise is to be found in the local natural history societies, with bodies such as the London Natural History Society having a long record of dedicated biological recording. The need to communicate and exchange data with local records centres is also a high priority.

7.2 Objectives

- To identify biodiversity indicators and establish a programme for monitoring them.
- To establish, in partnership with others, programmes that will monitor the progress and success of the actions within the action plans.
- To produce an annual statement on progress, recording the extent of key habitats and species and the level of community participation in biodiversity initiatives.

7.3 Proposed action

MR1. To establish a monitoring and plan review forum with relevant partners within the overall Biodiversity Steering Group structure. This will need to review the existing recording mechanisms in the area. **Action: LVRPA and partners.**

MR2 To ensure that the biodiversity of the Park is monitored by:

- a) identifying an appropriate minimum list of indicators, which will be reviewed on a regular basis.
- b) devising simple monitoring procedures which will be carried out at regular intervals for each of the indicators identified.
- c) Recording the results of the monitoring.

MR3. To encourage the recording and monitoring of wildlife and habitats within the Lee Valley Regional Park by:

- a) seeking the involvement of amateur naturalists and natural history societies, some of which may be national eg British Dragonfly Society;
- b) supporting monitoring schemes (such as the Wetland Birds Survey (WeBS) and dragonflies);
- c) the dissemination of such information (for example by monthly updates on bird sightings); and
- d) the organisation of events (such as the Winter Birdrace and Day Study Courses). **Action: LVRPA, LVCG, NHS, LRCs.**

MR4. To ensure that all recording and monitoring is adequately documented and validated by exchanging biological information with the appropriate Local Records Centres on an annual basis. **Action: LRCs and all interested parties.**

MR5. To continue to record visitors to sites, as well as participation in organised events and other activities. Annual figures to be published. **Action: LVRPA, landowners/managers.**

MR6. To identify appropriate resources to ensure that adequate monitoring is carried out. **Action: LVRPA, LAs and partners.**

8. GENERIC ACTIONS

A glance through this document will show that a number of issues will be common to many individual habitat or species plans. Many may best be dealt with through policy development by the Lee Valley Regional Park Authority and other organisations with an involvement in the Park. At this stage the following are suggested as being of high priority.

8.1 Policy and legislation

- G1.** To seek adequate recognition of the nature conservation value of the valley, both in the Lee Valley Regional Park Plan and at the national level through designation of appropriate areas as a Special Protection Area (SPA) and possibly as an Environmentally Sensitive Area (ESA). **Action: LVRPA, EN, EA, Cons orgs.**
- G2.** Ensure that policy initiatives that derive from the BAP are compatible with Local Plans or County Structure Plans at the appropriate plan review. **Action: LVRPA, LAs.**
- G3.** Ensure that all sites of wildlife importance are included in Local Plans by the completion of the next plan review. **Action : LAs.**
- G4.** Ensure that sound environmental practices underpin the work of all organisations involved in the Lee Valley Regional Park, not just in designated nature conservation areas. Incorporate appropriate policies at the next review. **Action: LVRPA, LAs, Ind.**
- G5** Oppose development harmful to the conservation interest of the Regional Park or contrary to the objectives within this Plan. **Action: LVRPA, LVCG, Conservation organisations, all interested parties.**
- G6** Seek to ensure that local plans promote the creation and restoration of key habitats within the Regional park and express support for developments which will result in such conservation gains. **Action: LVRPA, Conservation organisations.**
- G7.** Establish a Biodiversity Steering Group to identify the appropriate delivery and funding mechanisms for the BAP. **Action: LVRPA.**

8.2 Site safeguard and management

- G8.** Reduce habitat fragmentation and highlight the importance of the overall continuity of the valley corridor by seeking appropriate habitat enhancement in development plans. **Action: LVRPA, LAs.**

8.3 Future research and monitoring

- G9.** Devise and implement a programme of clarifying and mapping the extent of key habitats in order to provide a baseline for monitoring change. Devise and implement a monitoring programme. Complete mapping by 2002. **Action: LVRPA, LVCG and other appropriate partners.**
- G10.** Continue to study and monitor the effects of varying water quality on Lee Valley habitats and species and to progress this issue through the Catchment Management Plan process at each annual review. **Action: EA and other appropriate partners.**
- G11.** Seek to fill gaps in our knowledge of species distribution and abundance by working with local naturalists to identify (by 2002) groups in need of further information and devising (by 2003) a programme of action to increase recording. **Action: LVRPA, LVCG, NHS, LRCs.**

8.4 Communication and publicity

- G12.** Establish an appropriate Biodiversity Steering Group and sub-group structure that involves local communities, the private sector and others beyond the normal range of conservation organisations and ensures linkages with the Agenda 21 process. **Action: LVRPA and key partners.**
- G13.** Raise awareness of the importance of biodiversity conservation through events, press releases and articles. **Action: LVRPA, Cons orgs, LAs, EA, Ind and other partners.**
- G14.** Develop interpretative programmes and media to communicate biodiversity conservation to the public. **Action: LVRPA, Cons orgs.**
- G15.** Promote educational use of the natural resource of the Lee Valley through the development of educational opportunities and programmes. **Action: LVRPA, RSPB, LAs.**

Appendix 1. Organisations involved in the Action Plans

Ang - Angling organisations
BDS - British Dragonfly Society
BW - British Waterways
BTCV - British Trust for Conservation Volunteers
Cons orgs - Conservation organisations
Cons vols - Conservation volunteer groups
EA - The Environment Agency
EN - English Nature
FA - The Forestry Authority
HMWT - Herts and Middlesex Wildlife Trust
Ind - Local industry and commerce
LVRPA - Lee Valley Regional Park Authority
LVCG - Lee Valley Conservation Group
LAs - Local Authorities
LRCs - Local records centres
LWT - London Wildlife Trust
LNHS - London Natural History Society
LLP - Lower Lee Project
MAFF - Ministry of Agriculture, Fisheries and Food
Minerals - Mineral sections of county councils
NHS - Natural History Societies
NG - National Grid PLC
Pow - Powergen PLC
RSPB - Royal Society for the Protection of Birds
RMRG - Rye Meads Ringing Group
SASAG - St Albans Sand and Gravel Company
Sports org's - Sports organisations
TWUL - Thames Water Utilities Ltd
UH - University of Hertfordshire

Appendix 2 Glossary

This glossary defines the main terms used in the Biodiversity Action Plan (BAP) and explains the technical and policy terms used therein.

Agenda 21

An action plan for the 21st century endorsed at the Rio Earth Summit. Agenda 21 sets out how we can meet the needs of communities and individuals today, whilst improving the quality of life and safeguarding the environment for future generations.

Agri-environment Schemes

Schemes offering payments to farmers to promote farming that is compatible with protecting the environment and the wildlife on which it is dependant. For example, the Countryside Stewardship scheme and Environmentally sensitive areas.

Alien species

See non-native species.

Baseline

A defined condition for a site, habitat or species against which future changes in the condition of a site, habitat or species can be monitored and the significance of this change in conservation terms, assessed.

Baseline survey

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

Biodiversity

“Biological diversity” – the total variety of life on earth or any given part of it. Includes everything from bacteria to elephants.

Biodiversity Area

An area with a distinctive assemblage of landscape, habitats and wildlife.

Biodiversity Action Plan (BAP)

A framework for achieving the conservation of biodiversity based on the targeting of resources towards protecting priority habitats and species. BAPs also provide a means for the involvement in conservation of a wide range of organisations, including the participation of members of local communities. BAPs can be prepared at a range of levels from country-wide (the UK Biodiversity Action Plan) to the local level.

Biological Records Centres

A centre often based at county level for the collection, management, analysis and dissemination of information on the wildlife and habitats within that area. They will play a crucial role underpinning the monitoring of local BAPs and supporting the implementation and promotion of such local conservation initiatives.

Birds Directive

The abbreviated term for *Council Directive 79/409/EEC of 2 April 1979 on the Conservation of Wild Birds*. This Directive aims to protect bird species within the European Union through the conservation of populations of threatened birds and the habitats used by these species.

Bryophytes

A major group of plants that includes mosses and liverworts.

Champion (of a species or habitat action plan)

An organisation, that may be a business, community group, charity or government body, that undertakes to provide support for the implementation of an individual species or action plan within a BAP.

Common Agricultural Policy (CAP)

A European Community-wide policy which supports agriculture through price support measures and market management and through measures to improve agricultural structures.

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 management of human use of the environment to sustain the diversity of wildlife occurring there.

Conservation Objective

A stated aim for the level of protection for a habitat or species that is desirable in view of the aims of nature conservation. Objectives should be specific, measurable and realistic, hence they will often include targets.

Convention on Biological Diversity

The Convention was signed by the prime Minister and 150 other Heads of State or Government at the Earth Summit in Rio de Janeiro in June 1992. Under Article 6A of the Convention signatories must develop national strategies, plans or programmes for the conservation and sustainable use of biodiversity.

Countryside Stewardship

An agri-environment scheme through which landowners can receive payments for operations that result in the maintenance and enhancement of certain important landscapes and habitats. The scheme is administered by MAFF.

Earth Summit

United Nations Conference on the Environment and Development held in Rio de Janeiro in June 1992.

Ecology

The study of the inter-relationship between organisms and their environment.

Ecosystem

A community of interdependent organisms and the environment with which they inhabit and interact.

Environmentally Sensitive Area (ESA)

An agri-environment scheme run by MAFF designed to promote traditional farming practices to protect and enhance the environment. Farmers and other landowners can enter into 10 year agreements to manage their land in designated ways which maintain and restore particular landscapes and habitats.

Eutrophication

The over-enrichment of an aquatic habitat with inorganic nutrients, especially nitrates and phosphates, typically from sewage discharge or agro-chemical run-off. This may result in an imbalance in the ecosystem.

Fauna

All animal life

Flora

All plant life.

Habitat

A place in which a particular plant or animal lives. The term is often used in the wider sense, referring to major assemblages of plants and animals found together, such as woodlands or grassland.

Habitat Action Plan

A targeted programme of management measures aimed at maintaining/restoring a specific habitat. Habitat action plans identify conservation objectives and targets for the habitat concerned and specify actions and responsibilities for achieving the objectives.

Habitat Creation

Land management actions which are aimed at establishing a habitat on a site where it has not occurred before.

Habitat Restoration (or re-creation)

Land management action which is aimed at restoring a habitat on a site where it has previously existed, but subsequently lost.

Habitats Directive

The abbreviated term for *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and Wild Flora and Fauna*. This Directive promoted the conservation of certain key habitats and species within the European Union by requiring Member States to take measures to maintain or restore natural habitats and populations of wild species.

Habitat Scheme

A scheme proposed by MAFF to create a range of wildlife habitats by taking land out of production for 20 years and managing it in an environmentally beneficial way.

Indicator Species

An organism whose characteristics (eg presence or absence, population density, dispersion, reproductive success) are used as an index of attributes too difficult, inconvenient or expensive to measure directly. For example, the presence or absence of certain invertebrates can be used as an indicator of the quality of wetland habitats.

Intensive agriculture

A term used to signify the use of high input, high output crop and livestock husbandry systems in order to produce the optimum possible economic return for a piece of land. Intensive agriculture involves high usage of fertilisers, pesticides and mechanisation.

Invertebrates

Animals without a backbone eg insects

Lead Agency

An organisation, be they a business, community group, charity or government body, that undertakes to take a lead on the implementation of an individual species or habitat action plan, or specific action within these plans.

Local Agenda 21

Partnerships of local people, communities and organisations to achieve Agenda 21 at a local level.

Local Environment Agency Plan

An integrated action plan based on local river catchments which will help to contribute to the principle of sustainable development through integrated environmental management and improvement.

Local Nature Reserve (LNR)

An area of land that is of special nature conservation interest locally. LNRs are declared and managed by local authorities under the National Parks and Access to the Countryside Act 1949.

Management

The manipulation of a site to maintain or enhance its habitats and populations of species, through techniques such as grazing.

Management Planning

The process of identifying the management requirements of a site and developing the appropriate measures to achieve these requirements. The document prepared to record the management process is the management plan.

Microhabitat

A small part of a habitat which has distinct physical conditions eg a hollow in a tree.

Monitoring

A process of repeated observations of one or more elements of the environment, such as the population of a species or water quality. Monitoring provides factual information concerning the present status and past trends in environmental parameters. Monitoring key habitats and species will allow the assessment of the success of the BAP in protecting biodiversity.

Nationally rare species

Species of very limited national occurrence and distribution, found in 15 or fewer of the 10 x 10km ordnance survey grid squares that divide Great Britain.

Nationally scarce species

Species of limited national occurrence and distribution, found only 16 –100 of the 10 x 10km ordnance survey grid squares that divide Great Britain.

Native species

A species that occurs naturally in an area, without having been introduced by man.

Natural Areas

A concept introduced by English Nature for defining areas, based on their characteristic landscape and flora and fauna and resulting in the definition of 92 terrestrial and 24 coastal/maritime Natural Areas in England. These biogeographic zones reflect the geological foundation, the natural systems, processes and wildlife in different parts of England and provide a framework for setting conservation objectives.

Niche

The ecological space occupied by a species within a community or ecosystem.

Non-native species

A species which has become established where it does not naturally occur.

Oligotrophic

A habitat, usually a water body, having low productivity as a result of being low in nutrients.

Phase 1 (habitat survey)

A land survey to establish land uses and in particular, the location of important wildlife sites and habitats within a given area.

Pollard

A tree which has been cut at about two metres above the ground which then produces vigorous growth of new shoots. Willows are most commonly pollarded.

Ramsar Convention

An international convention originally agreed in Ramsar in 1975. Its aim is to stem the progressive encroachment and loss of wetlands and promotes the conservation of wetland wildlife. It requires the designation by signatories of Wetlands of International Importance, or Ramsar sites.

Red Data Book species

A species listed in catalogues published by the International Union for the Conservation of Nature (IUCN), national agencies or county-level organisations. Such species are endangered, rare, or vulnerable to extinction globally, nationally or locally.

Re-introduction

The release and establishment of a species to an area within its natural range but where it had previously become extinct.

Semi-natural habitats

A habitat modified to some extent by human activities, but still consisting of species naturally occurring in that area. Few habitats in the UK are thought to be entirely natural, the majority being semi-natural.

Set-aside

Arable land removed from production to reduce over production of certain crops and normally as a requirement for receiving agricultural support. Set-aside can be valuable to wildlife.

Short list species

The top priority species for conservation measures in the UK as identified by the UK Steering Report on Biodiversity. The report also identifies a long list of species which are of lesser, but still national conservation priority.

Site of Special Scientific Interest (SSSI)

An area notified by a statutory conservation agency as being of national nature or geological importance, as defined by the Wildlife and Countryside Act 1981.

Special Area of Conservation (SAC)

A site of European importance for wildlife designated under the Habitats Directive by the UK Government where the necessary management is applied for the maintenance or restoration of the habitats and/or species for which the site is designated.

Special Protection Area (SPA)

A site of international importance for birds designated under the Birds Directive by the UK Government where appropriate steps are taken to protect the bird species for which the site is designated.

Species Action Plan

A conservation plan for a species based upon knowledge of its ecological and other requirements, which identifies the actions needed to stabilise and improve its status.

Succession

The sequential development of plant or animal communities through time.

Survey

An inventory of the attributes of a site, area or region, usually in terms of habitat and species.

Sustainability

Maintaining the environment's natural qualities and characteristics and its capacity to fulfil its full range of functions, including the maintenance of biodiversity.

Sustainable development

Using the natural resources of the planet in a way that meets the needs of the present without compromising the ability of future generations to meet their needs. Conservation of biodiversity is the key test of sustainable development.

Target (Biodiversity target)

A quantifiable conservation objective. Targets may state, for example, projected numbers for a species population or area for habitats. Targets provide yardsticks to measure the achievements of the BAP.

Terrestrial

Living on or referring to land.

UK Biodiversity Action Plan

A strategy produced by the UK Government in 1994 which provides the framework for fulfilling the UK's contribution to achieving the Convention on Biological Diversity.

UK Steering Group Report

The report following from the UK BAP in 1995 which establishes specific actions and responsibilities for achieving the UK BAP.

Water Quality

The nature of a body of water in terms of its physical and chemical characteristics.

Wetland

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

Wildlife Site

A site not qualifying as of national importance for the wildlife it contains but regarded to be of local importance for wildlife, its importance being merited in a parish, district, borough or county context.