This booklet was produced by the London Biodiversity Partnership Acid Grassland Habitat Action Plan and Heathland Habitat Action Plan working groups. It was funded by The Royal Parks and the Mitcham Common Conservators.

For an electronic copy of this booklet, Biodiversity Action Plans for London and further information visit the LBP website: www.lbp.org.uk

The Royal Parks are the lead partner for the London Acid Grassland Habitat Action Plan.

Twenty seven London Boroughs have some acid grassland. Some key sites for acid grassland conservation in London that you can visit include:

Chislehurst Common, Bromley.
Contact: Chislehurst Commons Conservators ☎ 01689 825102

Hadley Green, Barnet.
Contact: London Borough of Barnet Greenspaces Team ☎ 020 8359 7825

Mitcham Common, Merton.
Contact: Mitcham Common Conservators ☎ 020 8288 0453.

Poor's Field, Ruislip Woods National Nature Reserve, Ruislip.
Contact: London Borough of Hillingdon ☎ 01895 250635

Richmond Park National Nature Reserve, Richmond upon Thames.
Contact: The Royal Parks ☎ 020 8948 3209

Wanstead Flats, Redbridge.
Contact: Corporation of London ☎ 020 8508 0028

Wimbledon Common, Wandsworth and Merton.
Contact: Wimbledon & Putney Commons Conservators ☎ 020 8788 7655

Photographs, artwork and design by Nigel Reeve (The Royal Parks) except the bee-wolf wasp, Poor's Field (Mike Waite) and pink waxcaps (Piers Eley).

Acid Grassland Conservation in London

Lowland Acid Grassland is a national Biodiversity Action Plan habitat – one of our top priorities for wildlife conservation in the UK. It is mainly associated with the well-drained, acidic and infertile soils typical of many of London's commons, parks, golf courses and other open spaces. Such soils are widespread in London, overlying terraces of sand and gravel deposited over thousands of years by the River Thames, which has changed its course and level many times following successive ice-ages. These areas of poor soil may also support Lowland Heath – another habitat of national conservation importance. Acid grassland and heathland are often closely associated, and sites supporting both habitats are of particular wildlife value.

Why is it a rare habitat? Despite the suitable soils and the mild, dry climate of the region, acid grassland is now uncommon in London as a result of development, quarrying for aggregates and conversion into farmland or amenity areas. Some large sites remain, such as Richmond Park, Wimbledon Common, Putney Heath, and Wanstead Flats, but much of the rest of London's acid grassland resource is widely scattered as under-valued fragments on the margins of amenity grassland, scrubland, road and rail verges, and on wasteland - including some formerly developed 'brownfield' sites. Many of these areas and the wildlife they support are at risk from development, over-intensive use, inappropriate management, or neglect.

Front cover photographs:
Harebells, small copper butterfly, bee-wolfwasp, sheep's sorrel.

Acid Grassland Flora. The harsh, low-nutrient soil conditions tend to limit the dominance of any single species. As a result, the grassland contains a diversity of fine-leaved grasses such as common bent, red and sheep's fescue, mat grass and others. Purple moor grass, tussock grass, sedges and rushes are characteristic of less well-drained areas. Characteristic wild flowers include: harebell, heath bedstraw, cat's-ear, sheep's sorrel, tormentil, common stork's-bill, heath milkwort, buck's-horn plantain and bird's foot. Nationally scarce plants found in London's acid grassland include clustered clover, upright chickweed and autumn squill. On the soil surface there is also a range of mosses and lichens to be found. Acid grasslands are also important for their fungi, in particular the attractively coloured waxcaps. Occasional stands of scrub with shrubs such as gorse and heather can provide important structural diversity and shelter within the grassland, as well as additional nectar and pollen sources for insects.

Pink waxcaps

Dwarf gorse

Heath milkwort

Heath bedstraw

Acid Grassland Fauna. A remarkable array of animals can be found in acid grassland. On a summer's day the grasses rustle and buzz with insect life. Shrews, voles and mice forage under the cover of the dense grass, while common lizards may be seen basking on sun-warmed patches of bare soil. Characteristic butterflies include the small heath, small copper, as well as the small, large and Essex skippers. In areas that are not disturbed by mechanical mowing or excessive trampling, meadow ants create distinctive mounds among the grass. The abundance of invertebrates attracts many birds such as the meadow pipit, skylark and the green woodpecker. Kestrels and owls hunt for small mammals, beetles and other prey.

The acid grasslands and heaths of Greater London, south Essex and north-west Kent host a distinctive community of spiders, bees and wasps, beetles, bugs and flies known as the Thames Terrace Invertebrates. This is one of the most important and threatened invertebrate assemblages in Britain. Many of these species can also be found living in places such as quarries, gravel pits, waste ground and fly-ash lagoons, but these are often very temporary habitats under constant threat of development.

Red-banded sand wasp

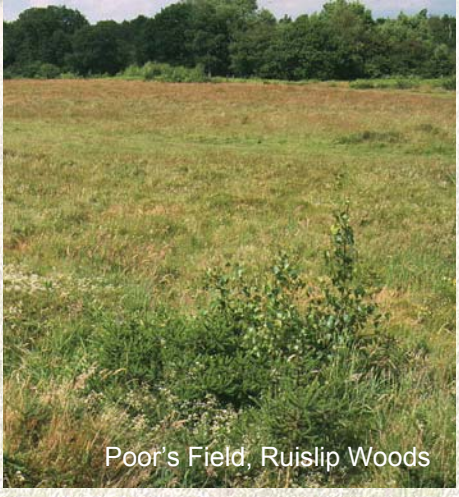
Of special importance among the Thames Terrace Invertebrates are the 'aculeate Hymenoptera', a group of insects that includes the burrowing bees and wasps. These tiny solitary insects create small burrows in patches of bare soil. Some feed on nectar and pollen, while others are predators or parasites of other insects. The red-banded sand wasp is a London flagship species for acid grassland. Endangered and nationally scarce species found in the region include the mining bee *Andrena florea* and the bee-wolf wasp.

Wolf spider

Essex skipper

Field grasshopper

Good Management Practice


Poor's Field, Ruislip Woods

The conservation of acid grassland and heathland depends on appropriate management. Left alone, these habitats become colonised by scrub and woodland, losing their special wildlife value. Although tree-planting is often popular with the public, inappropriate schemes are in fact a significant cause of the destruction of these vulnerable habitats.

An important aim of management should be to ensure a continuity of food-supply, cover and nesting habitats for a wide range of species throughout the season and from year to year. For example, many insects spend the winter as eggs or larvae in the dead standing stems or in flower heads. Also small mammals such as field voles and shrews require dense ground-level grass cover all year round.

Signs of poor condition: Fine-leaved fescues and bents are replaced by coarser rank grasses like cocksfoot, rye grass, common couch and Yorkshire fog. Other bad signs include a prevalence of thistles, ragwort, stinging nettle, broad-leaved plantain and rosebay willowherb.

Grazing. Ideally, acid grassland is maintained by carefully managed low-intensity grazing by livestock (usually hardy breeds of cattle, sheep or ponies) to prevent invasion by scrub and woodland (**see Box 1**). In some parks resident populations of deer carry out this role. Goats are useful for reducing established scrub. Other wild grazers may also be present; particularly rabbits which also dig into the ground. This digging, along with the trampling of the livestock, and erosion on animal tracks and paths helps to create a range of temporary bare patches for insects and colonising plants.


Welsh mountain pony


Longhorn cattle

Cutting. Where grazing by livestock is impractical a programme of cutting and scrub control will be needed (**see Box 2**). Frequent low-level cutting is extremely damaging. Therefore the entire area should never be cut all at once, but a proportion should be cut on a rotational basis, leaving substantial refuge areas uncut from one year to the next. Ideally some areas should remain uncut for at least 3-5 years.

The timing of the cut is also important. A summer cut is likely to deprive some insect species of food at a critical time. Similarly, where ground-nesting birds such as pipits and skylarks may be breeding, no cutting should take place from March to July. Grazing and public access may also need to be limited during this time. Many insects are still laying eggs well into September, so delaying cutting as long as the weather permits can be beneficial.

The problem of nutrient enrichment. This is a major threat to acid grassland and heathland. Fertilizers of any kind should never be used because the added nutrients encourage coarse grasses and scrub to rapidly displace the natural plant community. Dog-fouling is also a major source of nutrient enrichment in public areas. Schemes to reduce fouling (such as bins for dog waste) developed in partnership with dog walkers may be helpful. Car parks should not be sited near particularly sensitive areas and it may be necessary to divert paths away from them. Inappropriate informal paths, especially if dog fouled, can be scraped and closed down.

In habitat recovery programmes, where the soil is already heavily nutrient-enriched, regular cutting and the removal of arisings from the site can gradually remove nutrients from the system. However, this can take many years and a more radical solution is to scrape off the entire layer of topsoil from an area to expose the nutrient-poor subsoil. This provides a fresh start for the natural gradual re-colonisation by acid grassland species. The scraped soil can be removed from the site, formed into a bank or buried.

A scrape allowed to re-vegetate naturally with acid grassland ➢


Sand spurrey


Bee-wolf burrow


Hornet robber fly

Bare and disturbed areas. Many land managers in urban sites may be under pressure to re-seed eroded and bare areas for cosmetic reasons. However, re-seeding destroys the bare and sparsely vegetated ground which, especially in sunny locations, is very important to many animal species as sites for nesting burrows, egg-laying, and basking. Some predatory insects, such as robber-flies, also use these areas as viewpoints from which to hunt. If re-seeding is absolutely necessary, seriously consider using locally-gathered seed of native species rather than typical commercially available seed which contains undesirables such as rye grass or cultivars of native species.

The deliberate creation of disturbed and bare areas on south-facing banks and slopes, especially on sandy and gravelly soils is good practice. Structurally uniform grassland may benefit from scarification or scraping of areas on a rotational scheme to expose bare ground and create a mosaic of microhabitats. Long thin scraped areas (around 2 metres wide) with wavy edges provide a lot of valuable edge habitat and can also be useful as fire-breaks on sites vulnerable to arson. However, the creation of banks, lumps and bumps can make mechanical cutting difficult in future and needs to be carefully planned.

Further Reading:

- Crofts A. & Jefferson R. G. (eds) (1994) *The Lowland Grassland Management Handbook*. English Nature/Royal Society for Nature Conservation.
- English Nature (1998) *Management of Bare Ground on Dry Grasslands and Heathlands*. English Nature.
- Fungus Conservation Forum (2003) *Grassland Gems: managing lawns and pastures for fungi.* Plantlife
- Harvey P. (2000) The East Thames Corridor: a nationally important invertebrate fauna under threat. *British Wildlife*, December 2000, pp. 91-98
- Harvey P. & Gunton T. (2003) *Thames Terrace Grassland: Guidance for Landowners, land managers, decision makers and planners.* Havering Wildlife Partnership
- Kirby P. (2001) *Habitat Management for Invertebrates*: *A Practical Handbook*. RSPB
- Taylor R.S. (1995) *A Practical Guide to the Ecological Management of the Golf Course*. Int. Golf & Greenkeepers Association and STRI,Bingley

Box 1: Grazing Lowland Acid Grassland

The historical decline of grazing on heaths and commons has been a major threat to London's heathlands and acid grasslands. Of course, some sites may be unsuitable for livestock, but do consider the possibility of grazing a site. GAP (the Grazing Animals Project) will advise and can help to set up partnership schemes with land managers and graziers. Expert advice is required on fencing, the type of livestock and to ensure the safety and welfare of the animals. Sheep and goats are normally terrified by dogs, therefore cattle or ponies are a better choice for use on sites frequented by dog-walkers. Different livestock and grazing regimes will also produce rather different plant communities, so good advice on what is best for your site is important.

The poor quality grazing on lowland acid grassland and heathland means that hardy breeds are usually recommended, but less hardy stock may also be used if managed with care. Goats are browsers rather than grazers, and so are most useful for scrub control. As a first step, here is a brief introduction to the habitat management issues for the main types of grazing livestock that may be used.

Cattle: Suitable hardy breeds include Shetland, Beef Shorthorn and North Devon. Cattle have broad mouths and rather than selecting individual plants from the sward they tend to graze in preferred areas. This creates a desirable mosaic of varying vegetation heights with grazed patches of fairly even height. This favours less competitive and rare plants which may be picked out by other more selective grazers (such as sheep) but is less good for certain insects, spiders and other invertebrates that benefit from a more structurally diverse sward. All the hardy breeds will graze purple moor grass (*Molinia*), sedges and rushes, and will browse on woody species such as birch, hawthorn and gorse. Cattle are good at grazing-out invasive grasses like *Molinia* which can dominate boggy areas and may quickly take-over after fires on drier areas. Cattle are also heavy and their trampling can help to control invasive species such as bracken. In areas that may be damaged by too much trampling, smaller breeds such as Highland and Dexter may be a good choice.

Horses: Dartmoor, Exmoor, New Forest and Welsh Mountain ponies all graze mainly on grasses and create a structurally diverse acid grassland habitat good for a range of wildlife, with areas of flower-rich short sward interspersed with taller vegetation. These breeds are also suitable for heathland; especially those in London which tend to contain a good deal of acid grassland. Although good at maintaining open habitat, ponies are not really browsers and therefore less effective at controlling established scrub. However, when grass is in short supply they may take bracken, gorse shoots and heather.

Herdwick

Swaledale

Sheep: Upland and hill breeds of sheep such as Swaledale and Beulah Speckled Face are all suitable for grazing on acid grassland and heath. Hebridean sheep are known to be particularly effective in controlling *Molinia*. All these hardy breeds of sheep will take finer sedges and rushes and will also browse on low shrubs such as young birch, gorse shoots and heather. The low weight of sheep results in only light trampling that has little effect in controlling established scrub. Grazing sheep tend to pick out the flowering heads and buds of a range of herb species, which can be problem when trying to conserve species-rich swards. Sheep produce tightly-knit swards when overstocked, but at the right density they produce a sward with good structural variety.

Stocking: Because of the poor quality of the grazing, if livestock are to be kept on site all year, hardy breeds are normally best; even with our mild London winters. Avoid over-grazing and do not use feed supplements as a substitute for taking animals off the land when there is insufficient grass. A low stocking rate of no more than one cattle/pony, or two to three sheep, per hectare is usual to avoid over-grazing and the creation of large churned-up muddy areas. One alternative is to graze during the summer months with stock taken indoors or to an area of better grazing in the autumn. Less hardy breeds can therefore be used, but winter stocking is preferable for wildlife conservation because it allows the sward to set seed and insects can complete their life cycles. This is especially true on smaller sites where the whole area may be grazed. A further alternative is to arrange with a grazier to bring livestock in at a relatively high stocking density for a short period, so the animals can be removed when the condition of the site has improved. Grazing in the spring is good for controlling scrub as emerging leaves and buds are at their most palatable. Grazing in the autumn and winter is good for reducing bracken and invasive grasses.

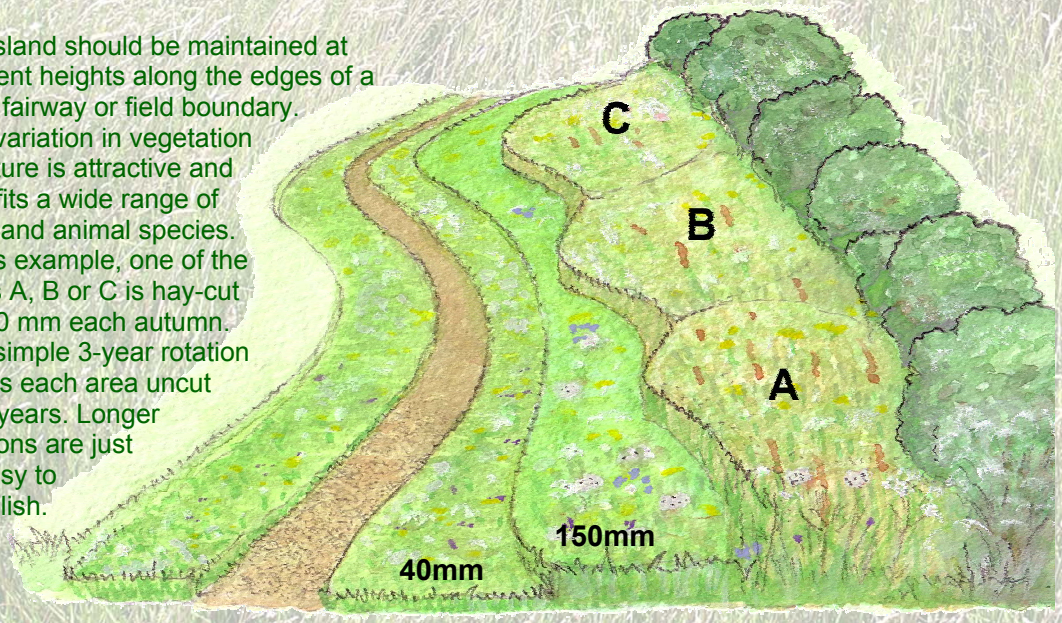
Low soil nutrient levels are vitally important for acid grassland and heathland conservation. Removing dung from the site is very helpful, and will also help to reduce added nutrients from feed supplements if these have been used. The impacts of supplementary feeding may also be reduced if it is confined to a nearby location of less conservation value in which the animals can spend some time resting and dunging.

Box 2: Cutting Lowland Acid Grassland

Because of the need to reduce nutrient levels, a key principle of cutting acid grassland is that the arisings must be removed from the site. There are many types of machines and only a selected review is possible here. Unfortunately, many of the flail-mowing and rotary blade machines in widespread use are designed to create a fine mulch of cuttings that remains on site. This not only returns unwanted nutrients into the sward, but also causes the maximum damage to insects and other grassland wildlife.

From a wildlife conservation standpoint, the best method is to carry out a hay cut using a reciprocating blade (finger-bar) cutter, then to allow the arisings to lie for a few days before raking-off and removal off-site. Such cutters minimise bruising of the vegetation and so maximise the survival of wildflower seeds, insects and other invertebrates during cutting. The delay before the collection of arisings not only allows them to dry, but permits surviving invertebrates to escape into the surrounding area. Walk-behind cutting machines with reciprocating blades or finger-bars (sometimes called power-scythes) are available from a number of manufacturers (e.g. BCS, Rapid-Euro and Agria) and a mini-baler can be used to collect the arisings*. Such cutting and baling machines have been designed for use on rough, uneven terrain such as alpine meadows and are therefore well-suited to dealing with the tussocky structure of acid grassland They are lightweight with a low ground-pressure, manoeuvrable and have a low centre of gravity for working on slopes.

Grassland should be maintained at different heights along the edges of a path, fairway or field boundary. This variation in vegetation structure is attractive and benefits a wide range of plant and animal species. In this example, one of the areas A, B or C is hay-cut to 150 mm each autumn. This simple 3-year rotation leaves each area uncut for 2 years. Longer rotations are just as easy to establish.



Cutting machines such as disc and drum mowers may also allow a hay-cut, but the level of damage to creatures in the grass will be higher than with a reciprocating blade machine. Cut and collect machines have the practical advantage of cutting and collecting arisings in one action. Typically these use vertically operating rotary flails that cut on impact and blow the arisings into a hopper. A range of machines is available from various manufacturers such as Richard Long, Wessex, Amazone and Ryetec. The conservation benefit of these machines is that the arisings are removed, but a negative element is the increased mortality of grassland creatures caused by the cutting action.

Whatever method of cutting is used, there is a major benefit to wildlife of cutting areas in a rotation that leaves some refuge areas uncut from one year to the next, and some areas uncut for at least 3-5 years. This can help wildlife to persist in an area despite cutting. Cutting at heights of 100mm (4 inches) or higher will also increase the survival of overwintering insects and their larvae and eggs, spiders and other invertebrates, as well as small mammals, reptiles and amphibians.

CONTACTS

FACT (Forum for the Application of Nature Conservation Techniques) is an initiative of 30 conservation and land managing organisations from across the UK. Website: www.practicalsolutionshandbook.info. For enquiries about initiatives, advisory leaflets and organisational contacts: Contact: Tony Robinson, Land Management Officer, English Nature, Bishops Hull, Roughmoor, Taunton, Somerset TA1 5AA. Tel. 01823 283 211. E-mail: tony.robinson@english-nature.org.uk

Eco-Lots is a free on-line service designed to assist with the environmentally sensitive and sustainable management of land, trees and wildlife in the UK. It seeks to do this by providing a free online noticeboard for sales, wants and events covering a wide range of rural products and services. Website: www.ecolots.co.uk.

GAP is a partnership working to help grazing managers and grazing advisers deliver biodiversity targets by grazing, as part of integrated, viable and sustainable land management systems. Contact the Project co-ordinators: The GAP Office, The Kiln, Mather Road, Newark, Nottinghamshire. NG24 1WT. Tel: 01636 670095. E-mail: gap@cix.co.uk. Website: www.grazinganimalsproject.org

Machine rings. Land managers may be unable to commit funds to invest in specialised machinery. However, it is often possible to hire, or to become part of a Machine Ring where equipment is shared between organisations. Machine Ring packs as well as a number of free publications can be obtained from English Nature Tel. 01733 455100.