Unimproved Neutral and Dry Acid Grassland

1. Habitat Definition

Unimproved neutral grassland is a feature of lowland mineral soils with a pH between 5 and 6.5 and which are neither very wet nor very dry. Broadly defined as mesotrophic (meaning neither very acid nor very alkaline) grassland the habitats can be highly variable in appearance with transitions between plant sub-communities occurring largely according to underlying soils. Intermediate vegetation stands may, for example, include poor fen mire plant communities on wetter neutral soils or calcicolous (meaning alkaline loving) grassland species on heavy calcareous soils. Of greatest interest, though increasingly rare, are species-rich old meadow and pasture grasslands. The National Vegetation Classification for the unimproved neutral grasslands occurring in Sussex is MG5. (MG5 is defined as grassland having crested dogstail grass and black knapweed as constants, accompanied typically by red fescue, brown bent and sweet vernal grasses plus bird's foot trefoil, red clover, sorrel and green-winged orchid).

Dry acid grasslands overlie acid igneous and sandstone rocks, surface sand and gravel deposits of a pH of less than 5.5. These calcifugous (meaning calcium hating i.e. acid loving) plant communities vary with local and regional variations in soil and soil moisture, but always include specialised species and assemblages not found in neutral grasslands. Although prevalent in the uplands of Britain, acid grassland is rather uncommon in the lowlands where it occurs mainly on nutrient poor dry sandy soils. The National Vegetation Classification for unimproved dry acid grasslands occurring in Sussex is U1. (U1 is defined as having the grasses sheep's fescue and brown bent plus sheep's sorrel as constants, accompanied typically by winter annuals that flower in the spring, and heather and gorse).

Unimproved neutral grasslands are generally much richer in plant species than unimproved dry acid grasslands, yet both are of extremely high conservation value - see section 3, below. Semi-improved grasslands which may have been ploughed in the past and had some artificial fertiliser applied, have a significantly reduced species diversity, yet still retain a number of native grasses and wildflowers and can therefore still be of high conservation value. Agriculturally improved grasslands on the other hand may only contain a very few commoner wildflowers such as buttercups and are of little conservation value.

2. Current Status and Distribution

2.1 Area / Extent

National estimates of remaining unimproved grasslands range from around 5,000 to 10,000 ha of neutral grasslands and between 10,000 and 20,000 ha of lowland acidic grassland. Agricultural intensification precipitated a huge decline in their former extent and loss from many former localities. Both types are therefore scarce (Crofts and Jefferson 1994), usually small and fragmented in extent. Incomplete mapping, surveying and collation of site information has further complicated quantification of the resource area and extent. It is thought that although the best sites are known, more may be discovered as some landowners are aware of their sites' value and remain quiet, whilst others are unaware. Publicity initiatives particularly in the High Weald AONB have continued to identify new sites in recent years. The following therefore represents an estimate and current working figure.

Sussex is a relative stronghold for unimproved neutral grassland. The Sussex Wildlife Trust (1996) estimated that Sussex currently possesses around 690 ha, accounting for about 17% of the remaining British neutral grassland, of which meadows are the rarest type. Figures based on the English Nature Inventories (1994), Sites of Nature Conservation Importance (SNCI) surveys, information from FWAG and an independent survey collated for this Habitat Action Plan conservatively estimate a resource of 860 ha, with approximately 380 ha in West Sussex (90 sites) and 480 ha in East Sussex (80 sites). The division between unimproved and semi-improved grasslands is, however, not a precise one. In addition, some loss or change is likely to have occurred at sites since they were first surveyed.

Accurate data on the extent of dry-acid grassland is also limited and further complicated by its dispersal amongst heathland. To date few independent sites have been recorded. An estimated total of 50 ha across ten sites known in East Sussex and 55 ha at 16 sites in West Sussex including mixed neutral/acid grasslands at six sites.

About 75% of neutral grassland sites in the east county and 65% of sites in the west are small in area (less than 5 ha) in area. All dry acid sites maintaining viable populations of rare species are below 8 ha with the majority less than 5 ha. An additional and uncalculated contribution to the overall resource exists on roadside verges, in churchyards, along arable field edges, paths, woodland rides and river banks which may contain relic MG5 or U1 grassland plant communities which maintain viable.

Accompanying the decline in extent has been a decline in quality of many sites where declining farming economies have undermined management continuity. Botanical surveys have shown that a range of degraded and damaged sites exist resulting from management cessation, land use conversion or intensification. Surviving high quality sites outside SSSIs, where traditional management persists, are generally small, fragmented and inaccessible, although a number are being brought back into management under grant schemes.

2.2 Distribution

Neutral grasslands are found throughout Britain where suitable soils and soil moisture are present. MG5 grasslands are present throughout the British lowlands but centre on the Midland's clay. The High and Low Weald natural areas as defined by English Nature also hold a significant proportion of the remaining resource in Britain. In Sussex unimproved neutral grasslands are relatively evenly distributed through the Sussex Weald along a broad swath from north-east of Midhurst, the north of Petworth, to the east and west of Billingshurst, to an area south of Horsham in West Sussex passing between Ditchling and Forest Row across to Hastings in East Sussex. Notable concentrations exist outside this band, however, for example close to the River Arun between Storrington and Watersfield, around East Grinstead, between Tunbridge Wells and Crowborough, and between Westbourne and Chichester near the Hampshire border.

Dry acid grasslands are fairly widespread in Britain where soils are base poor. Although uncommon in the lowlands, they are associated with free-draining sands of the Midlands, East Anglia and the South. U1 grasslands though fragmented and often undergrazed (dominated by *Festuca ovina*) over much of its range, does occur on warm and dry lowlands, notably the western Weald and Hastings Beds sands of the High Weald. Recorded dry acid grasslands in Sussex are few in number and randomly scattered where suitable soils are present but may be more widely associated with heathland, such as on Ashdown Forest.

3. Importance of the Habitat

Unimproved grasslands on neutral and acid soils are ancient habitats that have evolved through traditional land management by our ancestors over tens, hundreds or even thousands of years. Unimproved neutral grasslands in particular are extremely rich wildlife habitats with over a hundred plant species present in the sward of a single field. This is a product of inherently low soil fertility combined with a long history of grazing (pastures) and/or hay making (meadows) which prevents the domination of a few vigorous species or succession back to scrub and woodland. Additionally, grazing creates variations in habitat composition and structure, which increase the wildlife value particularly for insects and other invertebrates. Many species of bumble bees, moths and butterflies, grasshoppers, flies, wasps and beetles etc. are associated with or depend on, a continuum of grassland flowering plants for at least a part of their life-cycle. A number of nationally rare or scarce plant and animal species occur in unimproved grasslands in Sussex such as the green-winged orchid, meadow thistle and corky-fruited water dropwort. The considerable invertebrate fauna and also small mammals, in turn provide a foraging habitat for their predators. Barn owls, nightjars, woodpeckers, badgers, stoats, weasels and bats regularly visit from neighbouring habitats.

3.1 Pastures

Low intensity grazing creates a varied vegetation structure of short sward, areas of taller herbage and grass tussocks, and small patches of bare soil which offer a range of plant and invertebrate micro-habitats. A long history of traditional grazing can also result in considerable variation in ground conditions. Large ant-hills often develop and provide localised drier soil conditions, whilst at the other extreme are wet flushes, springs and marshy areas. Each supports a different and additional range of plant and animal species. For example ant-hills are an important food resource for green woodpecker, and wet flushes can be of special importance as feeding areas for wading birds such as snipe and woodcock. Birds such as skylarks and lapwings favour the open conditions of a varied pasture for nesting and/or feeding. Pasture provides excellent habitat for invertebrates, especially the insect groups mentioned above, because unlike hay meadows there is a continuity of vegetation structure throughout the year.

3.2 Hay Meadows

Hay meadows are especially important for an additional range of annual plant species such as yellow rattle, eyebright and fairy flax, which cannot survive spring grazing or trampling because of their need to flower and set seed on an annual or near-annual cycle. The tall spring growth of hay meadows can also provide cover in spring for the ground nesting skylark, and the ungrazed flowers and foliage provide an important food resource for a wide range of insect species. Many of these insects visit from adjoining habitats, and indeed a number of scarcer woodland species (such as long-horn beetles) actually depend on the close proximity of flower-rich grasslands as an early summer food resource. Once the hay has been cut the traditional grazing of the aftermath (grass growth) in autumn helps to keep coarse competitive

grasses such as Yorkshire fog suppressed, and provides the short sward conditions required by annuals germinating from seed each year.

3.3 Dry Acid Grasslands

Dry acid grasslands typically support fewer though more specialised plant and animal species than neutral and less acid grasslands (see Appendix). Grass sward plant communities consist of low growing plant species, which tolerate grazing and the more extreme soil conditions, but would suffer from shading and competition in the taller vegetation stands of more moist or fertile soils. A mixed heath and acid grassland can hold a greater variety of plants than heather dominated heaths and may more specialist plants such as marsh on wet soils and heath speedwell on drier soils. Acid grassland with bracken is utilised by breeding nightjars whilst woodlarks, wheatears, and pipits, as well as native reptiles, favour the association of acid grassland with heathland.

3.4 Conservation

Designation and Protection

Lowland hay meadow is the rarest type of neutral grassland, listed as an EC Habitats and Species Directive Annex 1 Habitat Type of EC Interest. MG5 plant community grasslands are not found in other parts of North Western Europe and are therefore on international significance in Britain. A selection will be designated as Special Areas of Conservation (SAC) under the EC Directive.

All types of unimproved semi-natural grasslands have declined dramatically both nationally and in Europe with the result that pristine examples are rare. Present habitat scarcity and local site variations mean that here in Sussex many of the remaining sites have unique plant assemblages with important local characteristics. Even small sites are important as refuges for previously common but now threatened species such as green-winged orchid, meadow thistle etc. Sussex and in particular the High Weald natural area (which also extends into Kent and Surrey) now holds a significant proportion of the remaining national resource. Their ecological importance is reflected in a number of these remaining grasslands having been designated as Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and Site of Nature Conservation Importance (SNCI). See also section 6.1.

Management

Unimproved grasslands need to be managed. Protective measures and designations although valuable on many of the best sites will not alone conserve the remaining grassland habitats. The continuity or reinstatement of traditional management is a pre-requisite to all other conservation measures. On undesignated sites in particular on-going management is the key. With most remaining sites privately owned, an appreciation by the landowner of a site's conservation importance is nearly always necessary before appropriate management can proceed (see 5.2 below). It has been proven that this needs to be galvanised and supported by local specialist advice and initiatives, backed up by financial or marketing support in form or another (direct or indirect). The availability of practical assistance can also make a significant difference on some sites, as evidenced by the recent emergence of conservation machinery rings, grazier networks and 'flying flocks'.

4. Importance for People, Cultural Significance, and Benefits to the Local Community and Local Businesses

The wild flowers and grasses, butterflies and other insects of unimproved grasslands excite both natural history enthusiasts and the general public alike but their importance goes far beyond their nature conservation value. Their appeal is deeply embedded in the cultural heritage of Britain and provides a link with pre-war history dating back to Saxon and perhaps even Iron Age times, of village and countryside life captured in literature, paintings and early photographs. Meadows and pastures to many people, whether realistic or not, represent ideas of harmony between man and nature, an essentially English countryside and a profusion of colour, variety and life lacking in many modern agricultural landscapes. In Sussex such habitats remain as relics of an ancient, and previously far more wide ranging, low intensity farm livestock system of small enclosed fields interspersed with woods, ghyll woods, hedges and shaws.

Unimproved grasslands provide aesthetic benefits: a focus of interest or pleasing 'backdrop' for those who live, work, visit or travel through the Sussex countryside. As a rich ingredient in the landscape jigsaw such grasslands help attract tourism and recreation revenue to the local economy and raise interest in the countryside and environment issues. Raising the profile of such habitats provides opportunities for local communities to become practically involved and responsible for their local wildlife and landscape resources.

Traditionally, a hay crop was taken from meadows for fodder and livestock bedding with the choice of grazing or leaving the aftermath. Pastures provided nearly all year round grazing. Today such production survives in a few localities although interest is again growing in managing and 'recreating' species-rich meadows and pasture. Management offers economical opportunities for landowners, consultants and contractors to benefit under existing and evolving agri-environment initiatives and financial support, and the associated seed harvesting, cutting rights, sale and marketing of grassland products such as wildflower and grass seed and hay. Future diversification for meadow products may include the sale of plant extracts to companies specialising in natural oils and perfumes, cosmetics, medication and alimentation.

5. Trends and Threats

5.1 Trends

In Norman England, at about the time of the Doomsday Book, around 300,000 acres of meadow and pasture existed. By the 1930s a far larger resource was present as the farming of large extents of unimproved grassland dominated livestock production and provided for a growing population. The 1939 Agricultural Development Act (which subsidised the ploughing of established grasslands) and changes in post-war farm methods and policy intensified land production and dramatically undermined the continuity of the management vital to the perpetuity of traditional grasslands. This led to a severe decline in the number of sites, their size and quality. Fuller (1987) stated that England and Wales had experienced a 97% loss of unimproved grassland between 1930 and 1984, the largest loss of any habitat. The greatest effect was felt on the easily 'improved' drier neutral grasslands of gentle topography, such as occur in Sussex. This downward trend has continued and remaining sites are often fragmented and marginalized. The lack of a comprehensive countywide survey hinders the accurate assessment of shrinkage in Sussex though Stevens (1990) recorded loss of 40.5 ha between 1978 and 1990 at just five sites (due to agricultural improvement and a golf course development) is indicative of a widespread loss that mirrors national trends. Offsetting known losses in recent years has been the 'discovery' of a small number of important and hitherto unknown sites, mainly by FWAG and the West Sussex High Weald Countryside Project. This should not of course be regarded as a 'real' increase in the conservation resource!

5.2 Threats

The nature conservation value of lowland grasslands is easily destroyed or damaged and changes in land management and perceptions of land value have had an enormous effect. Modern farming policy has encouraged greater production per unit of land and made extensive pastoral systems uneconomic and unattractive. Traditional grasslands have therefore been either subject to 'improvement' in a bid to reverse their declining economic return or pushed to the periphery of the farm economy and its management priorities. Habitat and species loss are a consequence of these measures or sometimes of a poor awareness of the grasslands' high wildlife and conservation value.

1. Agricultural land improvement destroys the habitat and reduces species diversity through:

a) conversion of grassland to arable crops;
b) ploughing;
c) re-seeding with more productive grass varieties such as ryegrass and timothy;
d) application of inorganic fertilisers and herbicides or excessive levels of manures and lime;
e) drainage and water abstraction lowering water levels.

2. The maintenance of grasslands and their associated species richness is dependent on the continuity of traditional management as either hay meadow or pasture (or sometimes with an occasional alteration between the two). Meadows may be grazed in the autumn and a hay crop taken in the late summer, whilst pasture is grazed only. Different management regimes evolve to suit local conditions though, and there are no hard and fast rules or prescriptions. Any shift in frequency or intensity in a long established management regime, unless undertaken with expert advice, can impoverish the species communities present. Alterations to traditional management continuity include:

a) a change from a single hay cut to earlier or more frequent silage cuts for livestock winter fodder;
b) under grazing which favours an increase in coarse grasses and the invasion of bramble, bracken or scrub at the expense of less robust species;
c) overgrazing in spring and summer which creates a uniform structured short sward reducing floral and invertebrate interest, and which increases the prevalence of bare ground allowing weeds to become established;
d) neglect/abandonment resulting in a decline in habitat and species interest from successional processes to scrub and secondary woodland. More than two or three years can prove deleterious, although "restoration" under specialist guidance may be possible.

3. Other factors, which may affect grasslands' continued nature conservation value, include:

a) lack of landowner interest or appreciation of the habitat's importance.
b) changes in land ownership. The sale of low productivity land and division of properties can reduce individual site viability and management options. New owners may lack the expertise, livestock and machinery or resources to continue appropriate management.
c) habitat shrinkage, fragmentation, isolation, poor access and marginalisation (a product of any of the above) may frustrate the co-ordination and application of effective management, raise individual habitat unit costs to prohibitive levels and weaken habitat integrity.

These may create pressures particularly to change the land use to one with a greater financial return, such as:

i) 1, 2a, 2c and 3b above
ii) tree planting
iii) residential, industrial, road or recreational development

Future uncertainties over agricultural policy, livestock or land management support, and rural land use mean that the financial stability necessary for maintaining long-term management regimes of these important habitats cannot yet be guaranteed.

6. Current Action

6.1 Protection/legal status.
A number of statutory and non-statutory designations and mechanisms exist to protect and enhance grasslands of recognised nature conservation value. They are identified and considered in County Structure and District Local Plans and decisions. These include: National and LNR, SSSI and SNCI to protect ecological integrity; Areas of Outstanding Natural Beauty (AONB) and Country Parks which largely cater to landscape requirements and the informal recreation potential.

Land is usually privately owned although statutory requirements and guidelines exist to encourage sensitive land management. SSSIs have special statutory provisions attached to their designation, which encourage correct management practice to maintain or enhance the ecological value of the site. SNCI designation does not impose any legal obligations upon landowners, but informs the planning process in order that sites may be better protected from development damage. A number of sites receive protective ownership from local authorities and conservation bodies for nature conservation and amenity purposes.

The approximate designation status figures are as follows: in East Sussex nine neutral grasslands have SSSI status and 57 SNCI. In West Sussex four neutral grassland sites are SSSIs and 71 SNCIs. In East Sussex ten acid grassland sites are designated SNCI and in West Sussex 16 sites are SNCI. Three mixed neutral-acid grasslands have SSSI status. Additional sites may possess nature reserve status, be included in Management Agreements or fall under AONBs considerations.

6.2 Information Exchange
Most unimproved grassland sites are owned by private individuals who are responsible for their management and protection. Many are unaware of the resources and advice available to them with the result that a few valuable sites have escaped attention and remain vulnerable to loss. It is also clear that a few owners, however, have painstakingly cared for their sites over many years without divulging their location or involving outside assistance. Growing interest in protecting and enhancing herb-rich grasslands is however being rewarded by a developing programme of assistance which together with a co-ordination of services and advice is expected to help sites to be safeguarded in the long-term:

i) The Sussex Farming and Wildlife Advisory Group (FWAG) provides specialist advice on management and grant aid opportunities and also helps land owners wishing to protect, create

and enhance grasslands. It promotes the habitats' value through a range of workshops, site visits, activities, events, information sheets and publications.

ii) The High Weald Unit seeks to raise awareness of the plight and importance of unimproved grasslands. The Unit's Weald Meadows Initiative employs a part-time Meadows Officer to provide advice and information to landowners wishing to manage their unimproved grasslands. By marketing local provenance wild flower and grass seed, herb-rich hay and plant plugs, the Unit is working to increase their availability and augment farm incomes. It holds a site information database with inputs from all relevant organisations and takes a lead in many grassland initiatives in the Weald. The accurate recording of all harvesting, creation and enhancement activities is also undertaken by the Unit.

iii) The Grazing Animals Project (GAP) national network established in 1997 seeks to bring together people and expertise in the grazing management of wildlife sites and the marketing of products from such sites.

iv) More recently a new magazine called 'Eco-Ads' has been launched in which landowners and managers, contractors and suppliers etc. can offer or request services and products on a regional basis (e.g. grazing, mowing, hay, seed etc.).

v) The Sussex Biodiversity Records Centre (at SWT) holds a number of grassland survey documents and runs the Environmental Survey Directory (ESD) which is a register of surveys carried out by other organisations and individual recorders. The SWT also operates the Rare Species Inventory (RSI) which holds information on rare and protected species in Sussex, and organises the annual Sussex recorders' seminar which acts as a forum for information exchange between different specialist recorders.

7. Existing Incentive Schemes

A number of national agri-environment schemes operate in different parts of Sussex. These are run by MAFF and offer a range of payments towards the conservation management of unimproved grassland usually as part of a broader package of measures. In addition a number of other grants and initiatives operate in Sussex either in conjunction with agri-environment schemes or in areas that are not otherwise covered by agri-environment schemes. All operate on the voluntary principle. Further background information is provided in the main introduction section 3. at the front of the 'biodiversity Action Plan for Sussex' folder:

Agri-environment Schemes:

a) Countryside Stewardship Scheme (CSS) makes annual and capital payments to encourage farmers and landowners to restore and manage existing unimproved sites, to enhance semi-improved grassland, and to create wildflower grasslands from scratch on ex arable land. Target areas within Sussex are the High Weald AONB, major Low Weald river valleys and the Chichester Plain. A number of sites including many small but valuable grassland fragments are already covered by the scheme. See also Costed Action section 11.

b) The South Downs Environmentally Sensitive Area (ESA) is targeted primarily at chalk grassland Sussex but also includes river valleys where neutral grassland is present. Annual and capital payments are offered to landowners entering land for maintaining the nature conservation interest of river valley grassland and its associated habitats.

c) The Organic Aid Scheme makes annual payments to facilitate conversion to organic production, and the retention and appropriate management of important wildlife habitats

and features. By reducing fertiliser and pesticide application the diversity of some grasslands can be expected to improve, especially where managed in conjunction with CSS.

d) The Habitat Scheme allowed farmers to enter established five-year set-aside land and thus naturally regenerating grassland, into a 20 year agreement and receive annual payments for on-going traditional management. Entry into the scheme was only available up to the termination of the five-year set-aside scheme in 1996.

Other Grants and Initiatives:
e) The Wildlife Enhancement Scheme (EN) is available for owners or occupiers of SSSIs to maintain and improve the wildlife interest by providing financial assistance. Annual and capital payments enable the landowner to follow an agreed traditional grassland management regime.

f) Management Agreements between county councils and landowners are possible under certain circumstances with payments towards the traditional management of important sites. In addition certain conservation organisations and district/parish councils may operate small grant aid budgets for conservation projects, usually targeted at SNCI sites/local biodiversity objectives, and with an element of visibility from public routes. All are designed to complement rather than duplicate or replace larger grant programmes.

g) The Weald Meadows Initiative (funded by EN, WWF and CA) was started in 1996 and is run by the High Weald Unit in partnership with Agrifactors Ltd., FWAG and others. It aims to secure the last remaining fragments of wildflower grassland within the Weald of Sussex, Kent and Surrey by identifying all remaining sites, providing management advice, by improving grassland viability through the collecting and selling of local seed, and developing new markets. A seed harvester and other specialist machinery have been purchased to facilitate this process which, together with the sale of seed, are co-ordinated by the High Weald Unit's meadows officer and operated by Agrifactors Ltd.

8. Potential

Due to the variety of modern land-use demands, returning to previous extents of neutral and dry acid grassland is unfeasible. The international importance of the remaining existing habitats does justify the need for a combination of effective protection measures, practical management incentives, and the development of a structured programme of expansion.

The conservation of the last remaining unimproved resource remains the highest priority for action since by definition unimproved grasslands are ancient and unrecreatable*. They also constitute the resource upon which actions to extend and increase the area of habitat in Sussex will be built. Such actions may be divided into enhancement of existing grasslands and creation of new grasslands from scratch. The opportunities for increase range from small-scale development sites to large farmland blocks, with the highest priority to extend and enlarge existing unimproved grasslands.

8.1 Enhancement

Semi-improved grasslands ploughed infrequently some time in the past or that have had some fertiliser additions may still retain a number of valuable wild grass and flower species

(including common species such as Knapweed and Ox-eye Daisy). These can be encouraged to flourish with specialist management advice, and the nature conservation value of certain sites further enhanced by the (re)introduction of plant species from local sources. Site-specific advice should be sought on special techniques which create niches for seed germination and establishment, or which involve the planting in of young wildflower plants. It is also important that seed or plants are of local native origin and full records maintained.

8.2 Creation

Although by definition unimproved grasslands cannot be recreated*, the creation of attractive "replica" species-rich grasslands is a proven and valuable medium to long term process requiring specialist and site-specific advice. Thorough site preparation and intensive early aftercare management over the first two or three years help ensure success before reverting to a traditional low intensity management regime. Site selection can also be very important in this regard as can the interest, skills and commitment of the landowner. As with enhancement it is important that seed is of local native origin and matched to the site conditions, and full records maintained throughout.

8.3 Opportunities

There are growing opportunities for the creation and enhancement of meadow and pasture grasslands on appropriate sites in and around the wider countryside and built environments of Sussex. In addition to increasing the overall resource, this provides an expanding market for the sale of meadow products (mainly seed), which helps towards the economic viability of existing unimproved sites and, importantly, opportunities to raise interest in and awareness of this habitat. Potential users include more farmers, local authorities, landscape architects and contractors, golf courses, countryside organisations, wildlife-community initiatives, garden designers and schools etc.

The greatest conservation potential on new sites is thought to be where they can be located alongside, and effectively enlarge, existing unimproved grassland sites. This is because larger habitat blocks can support more species, species occurring on the existing grassland are better able to colonise adjacent new habitat, the economics of managing a larger block can be more viable, and the existing unimproved grassland may be buffered (i.e. protected) from the possible effects of other nearby farming operations. Also spreading hay, containing seed from the donor site can be a more practical technique for sites in close proximity. Site selection for enhancement and creation should therefore, wherever possible, be targeted towards the enlarging to existing sites, the creation of grassland corridors and the linking of habitat fragments. There are, however, many other human, economic, practical, and ecological factors that can influence the choice of site and hence the potential success of any project, and any realistic opportunity should be examined on its own merits on a site by site basis.

*By definition the recreation of ancient "unimproved" grasslands with their undisturbed soil fauna and flora, long continuity of uninterrupted management, and "full" species complement is not possible. Hence the need to afford the highest conservation priority to securing the long-term management of the remaining resource. What is possible is the creation from scratch of flower-rich grasslands that are both attractive to people, valuable for a wide range of wildlife species, and important in the recovery of populations of once common species. in the medium term at least the range of plant and invertebrate species may be expected to remain smaller than the "genuine" unimproved version. In the longer term with secure traditional management and on-going enhancement it may be possible to re-establish even some of the rare grasslands plant species on appropriate sites.

8.4 Recording
The use of native local origin seed is fundamental to maintaining the integrity of local biodiversity in any project aimed at restoring, enhancing or creating grasslands (or any other habitat). It will be vitally important to continue recording and monitoring all seed collection, enhancement and creation activities in order to maintain the value and accuracy of biological recording in Sussex. In this way lessons may continue to be learnt from both successes and failures, and the full potential of the actions taken in implementing this plan more fully realised.

9. Objectives

i. Identify full extent and quality of existing unimproved neutral and dry acid grassland resource.
ii. Prevent further loss of habitat sites, fragmentation or decline in quality by securing all known neutral and dry acid grassland, including designated sites, under appropriate management.
iii. Identify and develop the economic opportunities, markets and viability of unimproved grasslands.
iv. Expand landowner advice and support opportunities.
v. Carry out a planned programme of grassland resource expansion (through enlargement of existing sites, restoration of neglected or damaged sites, enhancement of semi-improved sites, and the creation of new sites).
vi. Raise the profile of unimproved grasslands amongst residents and visitors, and the involvement of local owners and residents in their protection where appropriate.
vii. Establish best practice techniques through the research and monitoring of management, creation and enhancement techniques.
viii. Encourage maximum use of native seed of local origin in grassland resource and expansion projects.
ix. Ensure full records are made of all creation and enhancement activities, and new and existing grassland sites are monitored on a regular basis.

10. Targets

This Habitat Action Plan has now been archived

11. Costed Actions

Example: The Countryside Stewardship Scheme (see also section 7.a) is currently the most appropriate scheme for meeting the costs of management, enhancement and creation of these neutral and dry acid grasslands at the farm scale throughout most of Sussex.

Existing old grasslands qualify as lowland hay meadow and grazed pasture and receive annual management payments of £85/ha/year with an additional £30/ha/year for small fields under 3ha. An additional supplement of £40/ha is available for up to 5 years for controlling invasive species such as creeping thistle (or on enhancement sites for introducing appropriate flowers and grasses from species-rich grassland).

The creation of diverse sward grasslands on previously cultivated land (arable reversion) by encouraging natural regeneration and/or seeding with a native grass and wildflower mix and following up with appropriate management receives payments of £280/ha/year together with a recently introduced single payment of £250/ha towards the costs of native grass and wildflower seed (of local origin where available e.g. from the Weald Meadows Initiative).

The £40/ha/year supplement can be used towards promoting species colonisation or to raise water levels, and fencing/drinking water supply capital payments are available for the management of introduced livestock.

Creating uncropped and grassland margins inside arable field boundaries or alongside watercourses can provide further opportunities for introducing wild flowers and fine-leaved or tussocky grasses characteristic of meadows and pastures. Six metre margins are awarded £35/100m/year and two metre margins £15/100m/year. Scheme inclusion is discretionary to land managers who best meet its requirements. Costs in reality vary according to local site conditions and the nature of work required, but tend to be substantially higher than the payments received.

It has been calculated for example that wildflower grassland creation costs on heavy clay sites can range from £800 to over £950 + VAT per ha (based on figures from Nix) where the cost of native local origin Weald seed may represent between 50% and 70% of the total cost. Seedbed preparations, repeated weed control, sowing, and intensive early aftercare operations (mowing) and/or fencing account for the remainder. Contractors charges can put the figures higher still on small isolated sites (and contractors can often be reluctant to take on such sites). Farmers with their own machinery may be best placed to carry out the required operations on farmland. The spreading of seed-bearing hay from nearby unimproved sites is an alternative technique to the use of seed that can also substantially reduce seed costs.

On development sites grassland creation costs would represent only a very small proportion of total costs, whilst on small sites such as on school grounds, much of the necessary work may be carried out by hand using volunteers etc. so that the only cost may be the seed. Payments available through other grant schemes in Sussex tend to reflect the levels available under the Countryside Stewardship Scheme outlined above.

12. Targets and Costs

This Habitat Action Plan has now been archived

13. Monitoring and Review

This Habitat Action Plan will be monitored by the Sussex Biodiversity Partnership in conjunction with the Weald Meadows Group and Weald Meadows Initiative on an annual basis. This will include the monitoring of the fulfillment of the actions carried out against the targets set. A full review and updating of the plan will be carried out at five-yearly intervals.

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Consultation
This plan was prepared in consultation with the members and organisations of the Weald Meadows Group and the Sussex Biodiversity Partnership.

APPENDIX

1. KEY SPECIES

HABITAT	FLAGSHIP SPECIES	INDICATORS	RETRIEVABLES
1. Neutral grassland	Green-winged Orchid Yellow Rattle	Sweet Vernal Grass Sedge diversity Pepper Saxifrage Adder's Tongue Sneezewort Dyer's Greenweed Devils-bit Scabious Betony Bitter Vetch Fairy Flax Dingy Skipper Common Green Grasshopper Ant hills Ridge and furrow	Corky-fruited Water-Dropwort Southern Marsh Orchid Marsh Fritillary
2. Dry acid grassland	Adder Harebell mosses?	Wavy Hair-grass Heath Bedstraw Mat Grass Sheep's Fescue Tormentil Purple Moorgrass (damper areas) Lousewort (damper areas) Fairy Flax Ant hills	