

Grazing and Grassland Management Topic Report

A report to the Isle of Wight Biodiversity Steering Group

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1 Introduction

The Isle of Wight Biodiversity Action Plan Steering Group have identified a number of habitats on the Island for which specific Habitat Action Plans (HAPs) are required. The extent, distribution and special features of these habitats have been described in the Isle of Wight Biodiversity Audit and Assessment (published by the Steering Group in July 2000). As an initial step the Steering Group proposed that calcareous grassland and wetland HAPs should be taken forward in tandem, as many of the issues relating to grazing and grassland management are common to both.

Taking an issue led approach to the preparation of these HAPs also provides an opportunity to consider how grazing and grassland management might relate to other HAPs. Such an approach would also inform a number of related HAPs and provide a mechanism by which common issues can be integrated across them. This has a number of potential advantages in both the preparation and implementation of the subsequent HAPs.

HAPs identified by the Steering Group in the Biodiversity Audit and Assessment in which grazing and grassland management are likely to be important are:

1. Unimproved Neutral Grassland
2. Calcareous Grassland
3. Acid Grassland
4. Lowland Heath
5. Grazing Marsh
6. Wetlands (fens, swamps and marshes)
7. Saltmarsh
8. Parkland and pasture woodland

It was agreed by the Steering Group that a Topic Report should be prepared for Grazing and Grassland Management Issues. This could be used to feed into the production of the HAPs listed above.

2 The ecology of grazed habitats

2.1 History of grazed habitats in Britain

Some 7 – 8,000 years ago, woodland developed to cover much of Britain, as the climate ameliorated in the wake of the last glaciation. Along with the re-establishment of woodland over the land surface was the re-colonisation of the country with a varied wild mammal fauna, including many species that are now extinct. This fauna included carnivores such as the wild bear and wolf, together with many large herbivores including wild cattle – the now extinct aurochs, wild horses, red deer and wild boar. The Island's special mammal species such as the red squirrel, dormouse and woodland bats would have colonised the Island at this time.

The wild mammal fauna would have had a significant influence on the distribution and character of this primeval woodland. It now seems probable that considerable areas of Britain were in fact maintained as open grassland and heathland by wild grazing animals, with particularly large areas of open habitat being maintained along river valleys, on the steeper slopes and thinner soils. This pattern of open grassland and heathland dispersed within grazed woodlands can still be found in parts of the New Forest and was clearly the pattern of habitats found in Parkhurst Forest before its enclosure in the 19th century.

2.2 Early man and domestic animals

The colonisation of Britain by mesolithic farmers consolidated this pattern of natural clearings and glades within the primeval forest. Temporary areas of cultivation were established but the fertility of these would soon have been exhausted requiring new areas to be bought under cultivation. It is likely that these shifting areas of cultivation would have followed the clearings and glades originally created by wild herbivore grazing. Early farmers would have domesticated livestock to graze these natural clearings and would have enlarged them through de-forestation to create larger areas for livestock to graze. They would also have hunted the wild herbivore herds, which soon declined in number with wild cattle and horses probably becoming extinct in Britain by the Bronze Age.

The first farmers would have managed their stock by herding animals across unenclosed landscapes, perhaps bringing them into folds for protection at night. This system is still perpetuated in many parts of the world including parts of Europe, and continued in Britain well into the first half of the 20th century. The movement of stock across the landscape under the control of the herder would have replicated many of the impacts of the wild herbivores that had by now become largely extinct.

Although wild cattle and horses were probably hunted to extinction, wild deer seem to have survived through the prehistoric age. Later they were maintained within parks and hunting forests to provide sport for the nobility. These were often areas of near natural landscape in which the mix of woodland and open grazed habitats of the primeval forest had been retained and often on the poorer soils. The New Forest and Forest of Bere in Hampshire and Parkhurst Forest on the Isle of Wight (which once extended from the Medina to Calbourne) were established in this way. Within these forests the woodland and intervening open areas were grazed both by the deer and by the local residents of the area (the commoners) who were given rights to release their stock into the forest. Again, the commoners' cattle, ponies and other livestock would have perpetuated the effects of grazing animals on the landscape of the primeval wild herbivores they replaced.

2.3 Enclosure and development of compartmentalised grazing systems

Hedged fields formed from clearings in woodland occur over much of the west and south west of Britain. These so called assart fields have hedges composed of a diversity of woodland trees and shrubs that represent relicts of the former woodland cover from which they were formed. Elsewhere in lowland Britain, the medieval system of open strip field cultivation and herded livestock on common land was not replaced by hedged fields until the late 18th and early 19th century, as a result of the Enclosure Acts. The movement to enclosure of fields and the loss of open common grazing resulted in the development of what is often referred to as traditional mixed farming systems. Fields were generally cultivated on rotation, with farmyard manure

and other organic fertilisers used to maintain fertility. Some variation in this pattern of cultivation was likely to have been evident with wetter fields on heavier soils remaining longer under permanent pasture, and lighter better-draining fields being returned more readily to arable. Despite enclosure, extensive areas of open grazing remained, on both the chalk downs and the heathlands and moors (a term used on the Isle of Wight to describe the wet flood plain pastures of the river valleys).

The proportion of land under cultivation also varied considerably, depending on the economic circumstances of the time, with periods of war being responsible for increased cultivation of more marginal land. The return of arable to pasture to restore fertility was, however, nearly always required. The reversion to pasture would probably have allowed rapid re-colonisation of wild grassland species from both the soil seed bank and adjacent fields and a diverse flora would soon have re-established itself. Many parts of the Island's countryside were managed with this form of mixed agricultural system throughout the 19th and first half of the 20th century. Although more intensive than the open grazing systems of hunting forest and common land this mixed farming system created an enormously diverse landscape which was rich in biodiversity. It also retained ecological niches for much of the wildlife of the open forest clearings, maintained by the wild herbivores grazing the prehistoric forest from which it had evolved.

3 Effects of grazing and grassland management on the ecosystem

Grazing animals have several important effects on the vegetation on which they feed. The removal of the biomass of vegetation by grazing and browsing prevents the natural succession to tall rank grassland and the colonisation of scrub and eventually the development of woodland. Under most circumstances, grazing of grassland creates a stable mix of bryophytes (mosses and liverworts) grasses, sedges, rushes, herbaceous plants and/or dwarf shrubs, with nutrients being naturally re-cycled by fungi and soil organisms to maintain soil fertility. In woodland, browsing has a significant influence on tree and shrub regeneration and the species composition of the shrub and ground layers.

The pattern of grazing also creates a varied vegetation structure of tall and short grassland and heathland that is of vital importance for many invertebrates, ground nesting birds and small mammals. Grazed woodland develops a very characteristic structure with the development of a browse line, sparse open shrub layer, and grazing-tolerant ground flora. Browsed scrub such as gorse is also structurally more varied providing a range of habitat for birds and insects.

Trampling by livestock produces localised micro-habitats where other specialised plants and insects occur. They include the diminutive mouse tail, a nationally scarce plant of gateways, and specialist plants of heathland such as chaff weed, sundews and allseed. On the chalk downs the specific micro-climate around stock paths creates the ideal conditions for certain insect species, such as the Adonis blue butterfly.

Animal dung is an important habitat for many species. A large biomass of insects feed on dung including several rare and uncommon species such as the hornet robber-fly. Dung also provides habitat for many fungi, which in turn also attract their

own invertebrate fauna. The invertebrate biomass of dung is also of considerable importance to many other species including birds, and in particular, bats. Dung beetles can form up to 90% of the diet of larger bats such as the serotine and noctule at certain times of year.

4 Range and variation in grazed habitats on the Isle of Wight

4.1 Agriculturally improved grassland

Today, most agricultural grassland in lowland Britain has been created by sowing of grass seed mixes, and subsequent treatment with artificial fertilisers and herbicides. This sort of agriculturally improved grassland can occur over a wide range of soil type, from that occurring on chalk downland through to clays and marls, and sandy soils. The influence of soil type is masked in all these circumstances by the effects of seeding, fertilising and application of herbicide and the resultant grassland is of little intrinsic value to biodiversity.

Agriculturally improved grassland is however an extreme. Quite often, agricultural grasslands can be termed semi-improved. In these grasslands, the influence of sowing and application of fertiliser and herbicide is limited and allows some of the natural mix of wild grassland plants to show. On neutral clay and marl soils, this semi-improved grassland is often characterised by the presence of grasses such as Yorkshire fog, crested dog's tail and clovers. On wet or seasonally flooded soils in the river valleys, rush-dominated pasture develops with characteristic clumps of rush scattered across a grassland dominated by creeping bent grass, Yorkshire fog and creeping buttercup. If grassland remains un-ploughed and un-treated with herbicide or fertiliser for many years, there is a slow transition back to an unimproved or semi-natural state. Such grasslands can become quite species-rich and in terms of productivity, are similar to unimproved grassland. However, a lack of near-by sources of seed and other propagules and possibly other influences seems to prevent these grasslands developing the diversity of plants found in unimproved grassland for many years. Some semi-improved grassland can be of considerable botanical diversity and have high nature conservation value. Extensive grasslands of this sort can be seen around Newtown Harbour and the head of the Eastern Yar valley around Whitwell. Where semi-improved neutral grassland can be assigned to the MG5 *Cynosurus cristatus-Centaurea nigra* grassland of the National Vegetation Classification, it will be considered as a component of the 'neutral grasslands' habitat described in more detail below. Similarly, if semi-improved calcareous grassland can be assigned to one of the calcicolous grassland communities and semi-improved acid grassland to one of the calcifugous communities of the NVC these should also be considered as components of the habitats listed below.

Agricultural improvement tends to reduce the natural diversity of grassland plants and generally creates a much less diverse grassland in which the variation created by differences in soil and other environmental conditions is reduced and eventually lost. The following descriptions of grassland types refer to agriculturally unimproved grasslands and grazed habitats. These are vegetation types that consist of wild (unsown) plants that have not been significantly affected by the application of artificial fertiliser or herbicide.

4.2 Neutral grassland

The term neutral grassland is used to describe grassland that develops on more or less neutral soils. Within this broad group of grasslands there is a considerable variation relating to soil type and other environmental conditions. Meadow grasses dominate the sward, typically fescues, crested dog's tail, Yorkshire fog, common bent and sweet vernal grass. Herbaceous plants include black knapweed, bird's foot trefoil, ox-eye daisy, ribwort plantain, meadow vetchling and red clover. Sedges are also common with the bluey leaves of glaucous sedge being the most frequent. The low shrubby dyer's greenweed is also a typical plant of this grassland type on the Island, as are two members of the orchid family, the green winged orchid and autumn lady's-tresses. On the more calcareous marl soils, plants more typical of chalk grassland can also occur including fairy flax, hairy violet, yellow wort and quaking grass. By contrast, on more acid soils, devil's bit scabious, saw wort and sneeze wort can often be found.

On water-logged, heavy clay soils, gleying of surface horizons over a long period of time leads to changes in the vegetation, with acid tolerant grasses and heathers replacing the neutral grassland species. This process can be seen on the heavily gleyed clay soils between Cranmore and Bouldnor and within Parkhurst Forest where heathers, purple moor-grass, lousewort and heath dog-violet occur in a mixture with the neutral grassland species.

Hay meadows and pastures

Much of the neutral grassland on the Isle of Wight has been managed not only to provide pasture on which livestock can graze, but also to provide a crop of grass to be mown for hay. Mown grasslands provide a very different habitat to pasture. Hay crops are usually cut in mid summer; the meadows are then left to regrow and are normally grazed in late summer and early autumn. As the hay grows, the tall grassland provides habitat for insects, small mammals and nesting birds that contrasts with that found in pastures grazed at this time of year. The removal of the hay crop marks a dramatic change in the habitat leaving the open short grass of the mown field. Despite this, the meadow plants and animals are well adapted to cope this rapid change in habitat. Moreover, the hay produced is important to maintain the grazing livestock system through the winter months. The removal of hay depletes the soil of plant nutrients and over time the grassland productivity declines. This may increase plant species diversity, but may also make the hay meadow un-economic to cut. In traditional water meadows, this loss of plant nutrients was made up by irrigation with nutrient-rich river water. The narrow flood plains and generally poor acid soils found in most of the Island's river valleys were not suitable for irrigation as water meadows. However, it is likely that most hay meadows were treated with farmyard manure to restore fertility following hay cutting.

Neutral grassland, whether it is managed as hay meadow or pasture, is included within the **Unimproved Neutral Grasslands** habitat identified in the Isle of Wight Biodiversity audit and assessment. **Lowland Hay Meadows** are a priority habitat in the UK Biodiversity Action Plan. Also included in this habitat are the most unimproved of the semi-improved grasslands. Most of these have been managed as permanent pasture or hay meadow for many decades, but may have been treated with limited amounts of artificial fertiliser or farmyard manure. They are composed of wild unsown grassland species but tend to have reduced species diversity when compared to the truly unimproved grassland.

Key species of neutral grassland (Incorporating unimproved neutral grassland and lowland hay meadows)

Mammals: Brown hare

Birds: Grey partridge, skylark, barn owl

Reptiles: Adder, grass snake, common lizard

Insects: Reddish buff moth, small pearl bordered fritillary, marbled white, long-winged conehead

4.3 Calcareous grassland

The dramatic landscape features formed by the Island's chalk downs support a distinctive type of grassland. The thin soils that develop over the chalk downs are rich in calcium but poor in plant nutrients. The grassland they support is characteristically dominated by fescue grasses, although in places upright brome can also be abundant. Chalk grassland is renowned for its great diversity of plants. It is common for over 30 species of plant to occur within each square metre of chalk grassland with species such as wild thyme, salad burnet, rock rose and small scabious being particularly frequent.

A wide range of chalk grassland types occur on the Island depending on the degree of exposure, aspect and depth of soil. On the steep south facing slopes of many downs, a very short open sward develops which is dominated by sheep's fescue and glaucous sedge, commonly with mats of horseshoe vetch, the diminutive squinancywort and the internationally important early gentian (a species endemic to Britain and one of the few plants listed on Annex II of the EU Habitats Directive to occur in the UK).

On slightly deeper soils, the sward becomes more closed with red fescue being particularly abundant along with typical chalk grassland species such as wild thyme, rock rose, salad burnet, bee orchids and pyramidal orchids creating what many might think of as typical chalk grassland.

On the deeper soils, red fescue often dominates along with upright brome forming a tall chalk grassland in which species such as cowslip, field scabious, ox-eye daisy and orchids such as the fragrant orchid and common spotted orchid.

The Island is also remarkable in having areas of flint gravel and clay with flints capping many of the downs. The combination of these more acid soils and the chalk creates an unusual mix of heathland and chalk grassland plants, referred to as chalk heath. Some fine examples of this can be found on Mottistone Down, Brook Down and Tennyson Down.

Calcareous grassland also occurs in association with a few small outcrops of Bembridge Limestone across the north of the Island. These small outcrops support a flora very similar to that found on the chalk downs. Many of these examples of calcareous grassland are too small to graze with livestock, and occur within quarries or as isolated patches of grassland within scrub. Further areas of calcareous grassland occur on the Island's soft rock cliffs where calcareous marls and clays may be stable enough to support a grassland very similar to chalk grassland. Although the tendency of these soils to be very wet during the winter and their disturbed nature gives them a distinctive character, they support many of the typical species of chalk grassland including fairy flax, wild thyme, yellow wort and salad burnet. Livestock

does not normally graze these calcareous grasslands, but rabbits frequently maintain them as small lawns on the cliff face.

Lowland calcareous grassland is a priority habitat within the UK Biodiversity Action Plan.

Key species of calcareous grassland

Mammals: Brown hare

Birds: Skylark, grey partridge, linnet*, Dartford warbler* (* = associated with gorse scrub on calcareous grassland)

Butterflies and moths: Adonis blue, chalkhill blue, small blue, Duke of Burgundy, chalk carpet, bordered gothic, feathered brindle, auriferous pearl.

Grasshoppers and crickets: Stripe winged grasshopper, great green bush cricket

Flowering plant:-Early gentian, bunt tip orchid, bastard-toadflax, dwarf chickweed, dropwort

Lichens: *Fulgensia fulgens*, *Squamarina cartilaginea*

4.4 Heathland and acid grassland

On the gravel and sandy soils that occur on the caps of the downs and in places such as Headon Warren and outcrops of lower greensand, nutrient leaching from the soils' surface leads to acid nutrient-poor soils developing. This results in more typical heathland developing with heather, bell heather and gorse dominating the vegetation along, with heathland grasses such as the bristle bent. **Lowland Heathland** is identified as a priority habitat on the Isle of Wight in the Island's Biodiversity Audit and Assessment and is listed as a priority habitat in the UK Biodiversity Action Plan

On acidic sandy soils and where heathland has been heavily grazed or disturbed, an acid grassland develops. This is normally dominated by sheep's fescue and common bent grass often with sheep's sorrel and a number of low growing herbaceous plants such common cat's ear and a range of diminutive clover species. This sort of acid grassland is highly drought prone, and by mid summer can become parched and brown. Acid grasslands of this sort frequently occur in association with heathlands but can also form quite extensive areas away from the typical heather dominated heathlands particularly on the lower greensand outcrops and along rides in Brighstone Forest. **Lowland dry acid grassland** is a priority habitat within the UK Biodiversity Action Plan and is identified within the Island's biodiversity audit and assessment.

Key species of heathland and acid grassland

Birds: Dartford warbler, linnet, stonechat

Reptiles: Adder, common lizard

Insects: Mottled grasshopper, slender ground hopper, grayling butterfly, small copper butterfly, solitary bees and wasps

Flowering plants: mat grass, knawel, suffocated clover, spring vetch, heath dog violet, yarrow broomrape, greater broomrape, chamomile.

4.5 Fen, mire and marshland

Peat accumulates where soils are poorly draining, such as along the river valleys and around springs and seepages. This can support a variety of interesting mire or bog vegetation with many sedges and mosses and sometimes, insectivorous plants such as the round-leaved sundew. Some of the meadows around Alverstone in the Eastern Yar valley and the spring fed seepages of Bohemia Bog are particularly good

examples of this sort of acid mire vegetation. Where the peaty soils are flushed with lime or nutrient-enriched water plants like bog bean, marsh cinquefoil and bottle sedge can occur. This can be seen at several places along the eastern Yar and Medina Valley, for example Cridmore Bog near Chillerton. This sort of vegetation is often called Transition Mire. In other places, a fen meadow flora develops, with characteristic tussocks of yellow flag iris growing with marsh marigolds, meadow sweet, greater pond sedge and southern marsh orchids, in amongst clumps of rush and patches of wet grassland. These fen meadows are now relatively few and far between but can still be found scattered along the Island's river valleys. This range of grazed wetland habitat types has been classified as 'marshland' or 'grazing marsh' within the IW Biodiversity Audit and Assessment.

The mire and fen meadows of the Island fall mostly within a broad category of habitat termed **Flood plain and coastal grazing marsh** within the UK Biodiversity Action Plan.

Key species of mire and fen

Birds: Snipe, lapwing, redshank

Reptiles: Adder, grass snake

Insects: Hornet robber-fly, Desmoulin's whorl snail

Flowering plants: Common sundew, marsh violet, lousewort, pale butterwort, blunt-flowered rush, white sedge, carnation sedge, common cotton grass, bog asphodel, marsh helleborine

4.6 Coastal grazing marshes and saltmarshes

Around the coast of the Island are several places where freshwater marshes grade into saline influenced saltmarshes behind a sea wall or embankment. The largest example of such coastal grazing marshes is found between Bembridge and Brading, although there are also good examples along the Yar estuary and the Gurnard Luck. In the marshes nearest the sea, the wet grassland is dominated by creeping bent grass growing with many saltmarsh species such as saltmarsh rush, sea arrowgrass, sea milkwort, and sea spurrey. The ditches draining the marshes are often choked with sea club rush and the glaucous bulrush. In slightly less salt influenced grasslands, other plants with a typically coastal distribution are found such as the hairy buttercup, strawberry clover, slender spike-rush and divided sedge.

In other places, saltmarshes show a natural transition to adjacent neutral grassland with no sea walls or embankments separating them. Fine examples of this rare transition can be seen around much of Newtown Harbour. Here, grazing livestock can roam from grassland to saltmarsh. The transition in vegetation type is much more condensed than that found in the embanked coastal grazing marshes but includes a wide range of coastal plants growing at slightly different elevations in relation to the high tide line. The grazed upper saltmarshes are also rich in many saltmarsh plants with the drifts of sea pink or thrift flowering in late spring that are replaced by the deep purple of the sea lavender later in the summer.

Coastal grazing marshes are included within the Flood plain and coastal grazing marsh habitat within the UK Biodiversity Action Plan. Saltmarshes are a separate priority habitat within the UK BAP.

Key species of coastal grazing marsh and saltmarsh

Birds: Redshank, lapwing

Insects: Roesel's bush cricket, long-winged conehead, wasp spider

Flowering plants: Bulbous foxtail, divided sedge, slender spike rush, lesser water-plantain, tubular water-dropwort, small cord-grass

4.7 Wood pasture and parkland

A distinctive form of woodland is termed wood pasture. This woodland type represents something of a paradox in that it has been managed to provide both grazing for livestock, and timber from trees. The presence of trees, however, reduces the value of the grazing whilst grazing animals retard the regeneration of trees. Despite this intrinsic conflict, wood pasture is thought by many to represent the closest link with the primeval forests that once covered much of lowland Britain in prehistoric times. It is characterised by a mix of ancient trees, abundant dead and decaying wood, glades and clearings of grassland and heathland and patches of thorn and holly scrub that may develop in gaps created by fallen trees and on the edges of glades. The grassland and heathland that develops in wood pasture glades is similar to that described above as neutral grassland, acid grassland, heathland, calcareous grassland, mire and fen. The associated woodland is also similar in species composition to ungrazed woodland although the understorey is typically very sparse and open and composed of grazing tolerant shrubs such as holly. The woodland ground flora is also modified by grazing, with species intolerant of grazing and trampling such as bluebells and wood anemones being marginalized, and grasses and mosses dominating.

Wood pastures were managed as hunting reserves for kings and nobles for many centuries; these hunting forests or chases were maintained primarily for the deer and other game they supported. However, the local residents or commoners were given rights to graze their livestock and to collect fallen and dead wood, providing this did not interfere with the management of the game. These common rights were jealously guarded and often tied to certain properties associated with the forest or chase. The Isle of Wight once contained at least two royal forests, Parkhurst Forest in the north west of the Island and Borthwood Forest in the south east (both were once far larger than the areas referred to by these names today). Relicts of their former wood pasture management can still be seen in both areas of the Island.

Parkland is a modified form of wood pasture. In some instances, parks were created as ornamental landscapes associated with important houses. The origin of parks is however very varied. In some instances, parks were formed from agricultural landscapes with hedgerow trees being retained as scattered trees through open grassland. In some instances, ancient wood pastures have been converted to parkland whilst in others parks have been created by planting of often-exotic tree species such as horse chestnut or cedar. A feature of all parks is however the mix of open grassland and scattered ancient trees.

Parkland and wood pasture is identified as an important habitat within the Isle of Wight Biodiversity Audit and Assessment and **Wood-pasture and parkland** is identified as a priority habitat in the UK Biodiversity Action Plan.

Key species of wood pasture and parkland include:-

Mammals: Bechstein's bat, noctule bat, natterer's bat

Birds: Barn owl, spotted flycatcher, redstart, wood warbler, nightjar and many tree hole and crevice nesting birds

Insects: Beetles, flies and other insects dependent upon dead wood and ancient trees

Lichens: Many species of lichen that grow on the trunks of ancient trees in this habitat

Fungi: *Ganoderma applanatum*

5 National and international importance of grassland and grazed habitats on the Isle of Wight

Livestock grazing and management is vital to the conservation of at least five broad habitat types on the Isle of Wight. These have grouped together in the previous description as:

- Neutral Grassland
- Calcareous Grassland
- Acid Grassland and Heathland
- Fen, mire and marshland
- Coastal Grazing Marshes and Saltmarshes
- Wood pasture and parkland

The importance of these habitats to the Isle of Wight has been identified in the Isle of Wight Biodiversity Audit and Assessment, although they have been described under a slightly different set of titles. Similarly, the UK Biodiversity Action Plan has identified a number of priority habitats, which also have slightly different names but equate to the descriptions used in this report. At the international level, a number of grazed habitats are considered of European importance being listed on Annex I of the EU Habitats Directive. These are habitats which are threatened within Europe and require special conservation measures to maintain and where appropriate restore them to a favourable conservation status.

Table 1 provides a summary of the different titles given to these habitats on the Isle of Wight, within the UK BAP and where appropriate the EU Habitats Directive.

Table 1: Relationships between grazed habitat types with the IW and UK BAP Habitats and EU Habitats Directive

Grazed Habitats	IW BAP Habitat Names	UK BAP Habitat Names	EU Habitats Directive; Annex I Habitat Names
Neutral Grassland	Unimproved Neutral Grassland	Lowland Meadows	None of the IW Neutral Grasslands conform to Annex I habitat types
Calcareous Grassland	Calcareous Grassland	Lowland Calcareous Grassland	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuca-Brometalia</i>)
Acid Grassland and Heathland	Acid Grassland	Lowland Acid Grassland	None of the IW Acid Grassland conforms to Annex I habitat types
	Lowland Heathland	Lowland Heathland	Dry heaths (all sub-types)
			Northern Atlantic wet heaths with <i>Erica tetralix</i>
Fen, mire and marshland	Grazing Marsh	Coastal and Flood Plain Grazing Marsh	<i>Molinia</i> meadows on chalk and clay (<i>Eu-Molinion</i>)
	Wetlands: Fens, Swamps		Transition mires and

Grazed Habitats	IW BAP Habitat Names	UK BAP Habitat Names	EU Habitats Directive; Annex I Habitat Names
	and Marshes		quaking bogs
		Fens	None of the IW Fens conform to Annex I habitat types
Coastal Grazing Marshes and Saltmarshes	Grazing Marsh	Coastal and Flood Plain Grazing Marsh	Some coastal grazing marshes have elements of Atlantic saltmeadow habitat
	Salt Marsh	Coastal Saltmarsh	Atlantic saltmeadow
			<i>Spartina</i> swards
			<i>Salicornia</i> and other annuals colonising mud and sand
Wood pasture and parkland	Parkland and Pasture Woodland	Wood-pasture and parkland	Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains

6 Extent and condition of grazed habitats on the Isle of Wight

The extent of grassland and grazed habitats in each SSSI or SINC has not been possible to determine in every case, hence the following assessments often reproduce the total area of the SSSI or SINC of which the identified habitat is a major component.

The assessment of SSSI condition has been made by English Nature against condition targets defined by them. The condition tables for calcareous grassland are reproduced in appendix 1. Condition of SINC has been determined through discussion with the IW County Ecologist and the Wight Wildlife Officer, and is not the result of any fieldwork or site visits. These condition assessments should therefore be seen as provisional.

6.1 Neutral Grassland

The former extent of neutral grassland on the Isle of Wight is impossible to estimate as this has fluctuated considerably over the last few centuries as the extent of heathland, woodland and wood pasture has changed and as agricultural practices have slowly improved. From the end of the 19th century, through until the middle of the 20th century, neutral grassland would have been a widespread and common habitat across much of the Isle of Wight, and in particular the heavier clay soils of the north of the Island. That is not to say that this grassland was all permanent. It is clear from the Tithe Maps of the mid 19th century, and from conversations with farmers who farmed on the Island before the Second World War, that much of the enclosed landscape of the Island was ploughed on an irregular basis. Arable crops were taken for a few years before being returned to pasture as part of a small scale, mixed farming system. A botanically diverse sward appears to have become re-established soon after cultivation, presumably from the soil seed bank and relict grassland left around field edges. This can be seen in many areas of the Island where there is evidence of recent cultivation in fields that now support neutral grassland. Artificial fertiliser was not widely used in the first half of the 20th century and soil fertility was never raised to the levels possible today; herbicide was also unavailable. The low soil fertility and lack of herbicide use were probably the most important factors in allowing species diversity to re-establish. However, farmyard

manure was used extensively as well as blood and bone meal, and marl dug from marl pits was spread on fields to maintain fertility, particularly before arable cropping or mowing for hay.

Botanically diverse neutral grassland was therefore a significant component of the Island's landscape until the mid 20th century although this was not necessarily permanent grassland, and much of it was treated with organic fertilisers to maintain or improve soil fertility. Only where soils were particularly heavy and poorly drained is it likely that permanent agriculturally unimproved grassland developed. In these locations, there was probably increased soil acidity and poor drainage, creating transitions and mosaics with acid grassland and heathland as can be seen around Bouldnor and Cranmore and within Parkhurst Forest.

The Isle of Wight Biodiversity Audit and Assessment identifies a total of 151 ha of unimproved and 185 ha of semi-improved neutral grassland on the Island. The definition of neutral grassland in this plan combines these two grassland categories making a total of 336 ha of neutral grassland. This is probably an underestimate of the actual area of the habitat as it is likely that some isolated meadows remain undiscovered.

Much of the known area of neutral grassland is included within SSSI (Sites of Special Scientific Interest) and SINC (Sites of Importance for Nature Conservation). Table 2 lists all the SSSI and SINC known to support neutral grassland on the Isle of Wight. Not all the examples of neutral grassland are in good condition. Some are being colonised by scrub and are ungrazed or inadequately grazed. Others are treated with excessive amounts of fertiliser or inappropriately mown.

Table 2: Extent and condition of neutral grassland SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Subsidiary habitat
1. Locks Farm Meadow	2.3	F	
2. Newtown Harbour	170 ha ³	F?	Hedges, ponds, woodland, transitions to saltmarsh and mudflat.

SINC name	Area ha ⁴	Condition	Subsidiary habitat
3. Staplers Heath	8.4	F?	Ancient hedgerows, semi-improved meadows
4. Barnsley Farm	5.5	?	Scrub, acid grassland, broad-leaved woodland
5. Newchurch Marshes	28.88	?	Scrub, marshy grassland
6. Landguard Manor Meadow	1.2	U	
7. Bartlett's Green Farm	4.33	F	Semi-improved grassland, wet grasslands, and scrub.
8. Ashey Cemetery	0.6	F	
9. Brading Churchyard	0.96	F?	Walls
10. Cowes Cemetery	7.31	F	
11. East Cowes Cemetery	1.33	F	Calcareous grassland
12. Fort Warden Fields	4.83	U	
13. Westhill Meadow, Norton	0.44	F	
14. Standen Heath	6.68	U	Wet woodland
15. Nodes Point Meadow	2.31	F	
16. Shalfleet Churchyard	6.64	?	Pond, hedges, walls
17. Swanmore Meadows	8.79	U	
18. Alverstone Marshes East	60.74	U?	Scrub
19. Osborne Park	37.76	U?	Semi-improved grasslands

SINC name	Area ha ⁴	Condition	Subsidiary habitat
20. Cracknells meadow, Yarmouth	0.45	F	
21. Calbourne Meadows	10.51	F?	
22. Moon's Hill	3.56	U	
23. Lock's Farm	27.62	F?	Arable
24. Wroxall Meadow South	10.41	F?	
25. Godshill Park	28.22	?	Broad-leaved woodlands, ponds, arable
26. Werrar Meadow	2.05	F?	
27. Hart's Farm Lower Meadows	8.7	F	
28. Heathfield Meadows	31.61	U	Saltmarsh, reedswamp, broad-leaved woodland
29. Gore Down	11.48	F?	Unimproved neutral and maritime grassland; rocky outcrops, scrub
30. Appuldurcombe Down	94.59	F?	acid grasslands, rock outcrops, broad-leaved woodland

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Estimated area of habitat within the SSSI

³ = The area of neutral grassland within Newtown Harbour is believed to be an under estimate. Neutral grassland occurs within the following parts of the SSSI:- Harts Farm Meadows, Jersey Camp firing range (incl. Robin wood), Lamblease Farm, Elmsworth Farm, Lower Hamstead Farm, Creek Farm, Fleetlands Farm

⁴ = Area of SINC including subsidiary habitats

Of the 30 sites listed in Table 2, 60% are in favourable condition or believed to be in favourable condition (F and F?). 27% are in unfavourable condition or believed to be in unfavourable condition (U or U?). The remaining 13% of sites are of unknown condition.

6.2 Calcareous Grassland

The former extent of calcareous grassland on the chalk was estimated by Chatters in his draft report to the Isle of Wight County Council in 1984. He estimated a mid 19th century area of grassland over chalk extending to some 2,314 hectares (5,718 acres). The current area of calcareous grassland, including that over Bembridge Limestone, is estimated in the IW Biodiversity Audit and Assessment as 673 hectares, a loss of some 1,641 hectares and a decline by 71%. This however is probably an over-estimate as the area of grassland over chalk estimated for 1850 included the acid grassland and heathland vegetation growing on the chalk downs, including that now within Brighstone Forest and on Ventnor Downs.

The current extent of SSSI and SINC containing calcareous grassland and its condition on the Isle of Wight is given in Table 3. This is based upon the same assessment process made for neutral grassland. Sites in unfavourable condition are either ungrazed or inappropriately grazed, are being invaded by scrub or have other inappropriate management such as golf course management on Compton Down.

Table 3: Extent and condition of calcareous grassland SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Comments
1. Arreton Down	29.77	F	
2. Bembridge Down	56.25	F	
3. Calbourne Down	15.4	U	In appropriate grazing and lack of scrub control result in unfavourable condition

SSSI name	Area ha ²	Condition ¹	Comments
4. Compton Down	196.25	U	Lack of grazing and golf course management create unfavourable condition
5. Eagle Head and Bloodstone Copse	10.33	F	Ancient woodland occupies the majority of the site with only a small area of calcareous grassland present
6. Garstons Down	20.3	F	
7. Headon Warren and West High Down	276.25	F?	Much of Tennyson Down not grazed
8. Mottistone Down	31.44	F?	
9. Rew Down	23.5	F?	Part of site in golf course in unfavourable condition
10. Rowridge Valley	38.9	U	Small area of calcareous grassland associated with ancient woodland
11. Ventnor Downs	162.6	F	
12. Shide Quarry	4.8	U	
13. Prospect Quarry	4.3	U	Quarry is important geological site
14. Brading Down West	4.42	U	
15. High Hat Reservoir	5.94	F	
16. Shalcombe Down	1.34	U	Plantation woodland
17. Freshwater Bay Cliffs	3.32	F	Chalk cliffs, Rocky shore
18. Calbourne Pumping Station	7.71	F	Scrub
19. Carisbrooke Castle	16.28	U?	
20. Chillerton Down	28.1	F	Quarry
21. Brighstone Down	21.42	U?	Scrub
22. Fore Down	17.36	U	
23. Brading Down	32.99	U	Semi-natural broadleaved woodland, scrub
24. Gallibury Fields	2.75	F	
25. Ashley Chalkpit	2.26	U	
26. Idlecombe Farm Down	8.37	F	Scrub and secondary woodland
27. Idlecombe Down	73.39	U	Lowland heath, Plantation woodland
28. Bembridge Down	46.65	F	Semi-natural broadleaved woodland; acid grassland
29. Knighton Down	14.32	F	Scrub
30. Limerstone Down	21.19	U	Scrub
31. Little Down	18.68	?	
32. Mersley Chalk Pit	8.81	U	Scrub
33. Arreton Down North	17.25	U?	Scrub and secondary woodland
34. Mersley Down North	7.2	F	Ancient woodland, plantation woodland
35. Mount Joy	3.73	F	
36. Newbarn Down, Gatcombe	21.55	U	Semi-natural ancient woodland, scrub
37. Northcourt Down	11.25	F?	Scrub
38. Pay Down	1.27	U?	
39. Pitts Farm Down	4.44	F?	
40. Ashley Down	10.03	U	Scrub
41. Kern Down Chalkpit	3.46	U?	
42. St Catherine's Hill	11.55	U	
43. St Martin's Down	12.21	U	
44. Watcombe Down	10.46	U	Scrub

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Area of SSSI or SINC including subsidiary habitats

Of the 44 sites listed in Table 3, 45% are in favourable condition or believed to be in favourable condition (F and F?). 53% are in unfavourable condition or believed to be in unfavourable condition (U or U?). The remaining 2% of sites are of unknown condition.

Acid Grassland and Heathland

The former extent of acid grassland on the Isle of Wight is virtually impossible to assess given the complex mosaic it forms with heathland and scrub. The former area of heathland on the Island was calculated by Chatters in his report to the IWCC in 1984. He calculated that there was some 729 hectares of heathland on the Island in 1850. This figure did not however include the extensive area of heathland and acid grassland that occurred on the chalk downs, particularly in the area of what are now Brighstone Forest and the gravel cap to the Ventnor Downs. The IW Biodiversity Audit and Assessment estimates an area of 92ha of acid grassland and 64 ha of heathland making a combined area of some 156 ha. If we assume that much of the 729 ha of heathland in 1850 also include acid grassland, the remaining total of 156 ha of these two habitats represents a loss of over 79% since 1850.

The current extent of acid grassland and heathland SSSI and SINC on the Isle of Wight is given in Table 4. An assessment of the condition of this is also given, based upon the same assessment process made for neutral and calcareous grassland. Sites in unfavourable condition are either ungrazed or inappropriately grazed or are being invaded by scrub.

Table 4: Extent and condition of acid grassland and heathland SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Comments
1. Headon Warren and West High Down	262.9	F	Heathland in favourable condition
2. Ventnor Downs	162.6	F	Heathland grazed and in favourable condition
3. St George's Down East	6.97	U	Semi-natural broadleaved woodland
4. Row Down	13.32	U	Relict heath
5. Dame Anthony' s Common	9.86	U	Scrub
6. Skinner's Hill	10.74	?	Scrub
7. Perreton Down	6.89	F	Woodland
8. St Catherine's Down	18.64	F	Calcareous grassland
9. Ventnor Radio Station	12.57	?	Chalk heath
10. Head Down	4.75	U	Scrub
11. Heath Hill	1.14	F?	
12. Sandown Golf Course	45.84	F?	Scrub, acid pond
13. Ningwood common	16.84	U	Scrub
14. Bleak Down	10.27	U	Acid grassland, scrub, pools
15. St George's Down West & North	10.05	?	Acid grassland

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Area of SSSI or SINC including other habitats. The area of chalk grassland and other habitats in the two SSSI listed is considerably larger than the area of acid grassland and heathland.

Of the 15 sites listed in Table 4, 40% are in favourable condition or believed to be in favourable condition (F and F?). 40% are in unfavourable condition or believed to be in unfavourable condition (U or U?). The remaining 20% of sites are of unknown condition.

6.3 Fen, mire and marshland

The former extent of fen, mire and marshland habitat on the Isle of Wight is not known. However, from historical accounts it would appear that these habitats were once widespread in the valleys of the Western Yar, Medina and Eastern Yar. In

addition, there are records of several mire habitats associated with spring line seepages such as that at Cockleton Farm, Gurnard and Colwell Heath. Further areas of mire vegetation are reported to have developed in the old mineral workings on Bleak Down. All these sites have now been lost. In addition to a decline in the extent of acid mire habitat, there has also been a change in the flora of those mires that remain. This is most clearly seen at Cridmore Bog. In the past Cridmore Bog contained insectivorous plants such as sundew and acid mire species such as bog asphodel. Both these species are now thought to be extinct at this site and the habitat has changed from acid mire to transitional mire. This habitat is no less interesting than the one it has replaced and is probably due to changes in water quality in the river Medina.

Although avoiding destruction, other fen and mire sites have been lost due to changes in management. When these habitats are ungrazed they revert to reed bed, swamp and scrub. The reed beds that form are however of generally poor quality and do not provide good habitat for specialist reed bed associated birds.

True grazed fen is now probably extinct on the Isle of Wight although it occurred in the past at a few places such as Colwell Heath and Afton Marsh, Freshwater. Colwell Heath is now destroyed whilst the fen vegetation in Afton Marsh has reverted to reed bed and scrub habitat. Despite this, relicts of the fen flora re-emerge following reed cutting.

Much larger areas of fen meadow occur on the Island although much of this is semi-improved and species poor. The best areas occur in the eastern Yar Valley around Alverstone. Other potentially important areas occur in the Medina Valley, although these are frequently un-grazed and are rapidly losing their biodiversity value. Fen meadow has been included within the definition of 'marshy grassland' within the IW Biodiversity Audit and Assessment, whilst the more species poor agriculturally improved and species poor flood plain grasslands have been included within the 'grazing marsh' habitat.

The current extent of acid mire habitat was not measured as part of the IW Biodiversity Audit and Assessment, which included it within a wider category of fen and marshy grassland. The area of remaining 'fen' was estimated as 6.3ha with an additional area of some 81ha of marshy grassland and 36 ha of abandoned grazing marsh, some of which may have characteristics of fen meadow or acid mire vegetation. The total area of flood plain and coastal grazing marsh is much larger extending to some 525ha.

Table 5: Extent and condition of fen, mire and marshland SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Subsidiary habitat
1. Alverstone Marshes	83.8	U	Swamp, woodland, and carr
2. Brading Marshes to St Helens Ledges	488.5	U	Coastal grazing marsh
3. Cridmore Bog	14.4	U	
4. The Wilderness	12.59	?	Wet woodland

SINC name	Area ha ⁴	Condition	Subsidiary habitat
5. River Medina: Shide	1.94	F	River
6. River Medina: Shide to Blackwater	6.68	F	Rivers and streams

SINC name	Area ha ⁴	Condition	Subsidiary habitat
7. Brading Marshes North	32.95	?	
8. Lukely Brook	1.38	F	River
9. Munsley Bog (Gt Budbridge)	8.46	U	Willow carr
10. Kennerley Heath (Gt Budbridge)	16.01	U?	
11. Wydcombe Estate	24.47	U	Woodland, acidic grassland
12. Bohemia Bog	3.34	F	acid grassland
13. Upper Dolcoppice	15.022	?	Ancient semi-natural woodland, acid grassland
14. Moor Farm	12.82	U	
15. Roud (Upper Yar valley)	4.48	U	wet grassland and scrub
16. Scotland Farm (Upper Yar valley)	14.73	U	Carr woodland
17. Nettlestone Marshes	7.12	F?	Unimproved neutral grassland
18. Great Budbridge	15.15	U?	flower-rich meadows, and scrub
19. Morton Marsh	6.79	?	
20. Sandown Levels	17.49	U	Reedbeds
21. Pope's Farm Marsh	2.09	F	
22. Compton Grange Marsh	5.3	U	
23. Perreton Marsh	14.33	F?	acid grassland, woodland
24. Sudmoor Dyke	17.79	U?	withybeds, herb-rich pasture and ditches
25. Plaish Water Meadows	9.46	F	Stream
26. Compton Marsh	8.81	F	maritime grassland
27. Redway	12	U	semi-natural woodland

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Area of SSSI or SINC including other habitats.

Of the 27 sites listed in Table 5, only one third (33%) are in favourable condition or believed to be in favourable condition (F and F?). The majority of sites (52%) are in unfavourable condition or believed to be in unfavourable condition (U or U?). The remaining 15% of sites are of unknown condition.

6.4 Coastal Grazing Marshes and Saltmarshes

Coastal grazing marshes on the Island are mostly an artefact of relatively recent changes to the management of the coast. The most extensive area of the habitat is within Brading Marshes, which was formed from intertidal habitats at the end of the 19th century. A large area of grazing marsh also existed in Newtown Harbour until the sea wall was breached in the 1950s, returning it to an intertidal state. As a consequence, there has been little overall change in the extent of coastal grazing marsh on the Island over the last 150 years, with if anything a slight increase in the area of habitat.

Some areas of saltmarsh on the Island have been grazed in the past by cattle and sheep, particularly those around Newtown Harbour, where they support extensive areas of high-level mixed saltmarsh vegetation. Changes in agricultural practice have reduced or removed grazing from some the Newtown Harbour saltmarshes. The implications of this on their vegetation and structure of the marshes and their biodiversity has not been assessed, but could well be detrimental to upper saltmarsh species. Elsewhere on the Island, saltmarshes have not been grazed in recent decades although they may have been in the past.

Coastal grazing marsh was not measured separately as part of the IW Biodiversity Audit and Assessment but was included within the 525ha of 'grazing marsh' habitat, which includes both flood plain and coastal grazing marsh. The flood plain grazing marsh habitat is mostly agriculturally improved or semi-improved wet grassland and is included within the fen, mire and marshland habitat. The total area of saltmarsh on the Isle of Wight is estimated as 159 ha. However, much of this has not been traditionally grazed and only areas around Newtown Harbour have been grazed in recent decades.

Table 6: Extent and condition of coastal grazing marsh and grazed saltmarsh SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Subsidiary habitat
1. Brading Marshes	488.5	U	Fen meadow and marshy grassland
2. Newtown Harbour	618.2	F?	Neutral grassland, intertidal flats
3. Yar Estuary	98.9	F?	
4. Ryde Sands	403.3	F?	Ancient woodland and intertidal flats

SINC name	Area ha ⁴	Condition	Subsidiary habitat
5. Gurnard Marsh	7.86	U	
6. Thorley Meadows	9.52	?	

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Area of SSSI or SINC including other habitats.

Of the 6 sites listed in Table 6, three (50%) are in favourable condition or believed to be in favourable condition (F and F?). A further two (33%) are in unfavourable condition or believed to be in unfavourable condition (U or U?). The remaining site is of unknown condition (17%).

6.5 Wood pasture and parkland

Wood pasture was once a widespread habitat on the Isle of Wight with extensive areas in the north west of the Island extending from Parkhurst Forest to Calbourne. Relicts of this survive within the remnants of Parkhurst Forest and within Northpark Copse SSSI. In the south east of the Island were further extensive areas of wood pasture including America Wood, Borthwood Copse and Apse Castle Wood. None of these former wood pastures are now grazed by livestock.

Changes in the historic extent of parkland on the Island have not been assessed. This is problematic as the area of parkland has changed in response to changing fashion and agricultural practices. Some of the best preserved parkland habitat is now within Osborne Park, Nunwell Park and Appuldurcombe Park. However, the biodiversity value of these parks has not been fully assessed, although they are known to retain some ancient trees and areas of associated unimproved or semi-improved neutral and acid grassland.

Table 7: Extent and condition of wood pasture and parkland SSSI and SINC on the Isle of Wight

SSSI name	Area ha ²	Condition ¹	Subsidiary habitat
1. Parkhurst Forest	183.46	U	Relict heathland rides and clearings
2. America Wood	21.4	U	Marshy grassland

3. Northpark Copse		U	
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SINC name	Area ha ⁴	Condition	Subsidiary habitat
4. Apse Castle Wood		U	
5. Nunwell Park	74.98	U	Chalk grassland
6. Appludurcombe Park		U	Acid grassland

¹ = Condition assessed as being favourable (F) or unfavourable (U). Sites for which there is some doubt over the assessment or are unknown are marked ?

² = Area of SSSI or SINC including other habitats.

All the former wood pasture and parkland habitats on the Isle of Wight are currently in unfavourable condition, either due to inappropriate grazing and arable cultivation or absence of grazing.

6.6 Summary of condition of grassland and grazed habitats on the Isle of Wight

The information in tables 2–7 has been summarised in table 8 to provide an overview of the current status of semi-natural grassland and grazed habitats on the Isle of Wight.

Table 8: Summary condition of SSSI and SINC containing semi-natural grassland and grazed habitats on the Isle of Wight

Grazing habitat type	Number of SSSI	Number of SINC	% Sites in favourable condition	% Sites in unfavourable condition	% Sites of unknown condition
Neutral Grassland	2	28	60	27	3
Calcareous grassland	13	31	45	53	2
Acid grassland and heathland	2	8	40	40	20
Fen, mire and marsh	4	23	33	52	15
Coastal grazing marsh and grazed saltmarsh	4	2	50	33	17
Wood pasture and parkland	3	3	0	100	0
Total	28	95	39	52	9

Table 8 shows that just over half the grassland and grazed habitats on the Island are in unfavourable condition (52%). Of poorest quality are the areas of wood pasture and parkland, all of which are in unfavourable condition. Neutral grassland sites tend to be in the best condition (60% in favourable condition). Calcareous grassland, acid grassland and heath and coastal grazing marshes all have about half the sites in favourable condition (40 - 50% of sites). Only 33% of the fens, mires and marshland sites are in favourable condition.

Reasons for sites being in unfavourable condition are reviewed in more detail in section 8. These include lack of grazing leading to scrub invasion, over-grazing and inappropriate use of fertiliser and herbicide.

7 Current action

English Nature have been set a target to ensure that 90% of land within SSSI is in favourable condition by 2010. To achieve this target, all SSSI are currently undergoing condition assessment against their conservation objectives. English Nature will then be required to ensure sites in unfavourable condition are brought into favourable condition. This may include provision of funding through management agreements.

The recent Countryside and Rights of Way Act, 2001 (CROW Act) also requires public authorities to ensure all SSSI in their ownership are brought into favourable condition. This will apply to sites owned by the Isle of Wight Council and Forest Enterprise.

A number of initiatives to restore grazing to sites have been undertaken in recent years. These have included:

- National Trust projects to restore grazing to heathland and calcareous grassland on Ventnor Downs
- Restoration of grazing to heathland and calcareous grassland on Mottistone Down and Mottistone Common (National Trust and Wight Conservation)
- Restoration of grazing to Rowborough and Idlecombe Down (Wight Conservation)
- Restoration and recreation of neutral and calcareous grassland on Wroxall Downs (Wight Conservation)
- Wight Wildlife funding to assist with top-up payments to the Countryside Stewardship Scheme to promote calcareous grassland restoration and recreation in the east of the Island.

English Nature is currently developing an Isle of Wight grazing project. This will seek to:

- Help farmers and landowners market products of extensive stock grazing regimes through branding and other initiatives.
- Provide funding to assist farmers to re-introduce grazing to existing semi-natural grassland and grazed habitats.
- Provide a market-led incentive to farmers and landowners to increase the area of semi-natural grassland and grazed habitats on the Isle of Wight.

8 Identification of issues

The value to biodiversity of the remaining semi-natural grassland and grazed habitats on the Isle of Wight is immense. It is estimated that over half of these habitats are in unfavourable condition leading to a loss of biodiversity. This section of the report seeks to identify the potential implications of this situation on nature and biodiversity conservation on the Island. It cannot hope to provide the answers to the issues raised, but it is hoped this report will be able to identify a range of mechanisms by which these issues can be tackled. These can be taken forward in more detail, within the individual Habitat Action Plans and the other projects such as the IW Grazing Animals Project. Looking to the future, a number of potential targets for habitat restoration and re-creation are have been identified.

8.1 Financial incentives

The most important factor that is common to the conservation and restoration of biodiversity to all grassland and grazed habitats will be the financial incentives. The value of current schemes such as Countryside Stewardship in achieving this objective need to be considered and current short-falls need to be identified. On SSSI, it may be that English Nature will need to provide additional assistance to land owners and managers. In the wider countryside outside of these protected sites, there is a need to reverse the trend of habitat decline seen over the past 150 years. Whereas this should be encouraged throughout the Island, there are areas where the potential gains are likely to be greatest and where efforts and financial incentives should be targeted.

Alternative methods of providing a financial incentive also need to be considered and evaluated. This might include niche and brand marketing schemes being considered through the proposed IW Grazing Animal Project.

The availability of a local slaughtering facility may also be critical to the success of local produce production and sale.

There is a strong link between biodiversity conservation and tourism. The potential profitability of conserving biodiversity for the rural economy needs to be promoted to farmers.

8.2 Availability of suitable stock and stock management expertise

Different habitat types and different situations require different stock types to graze them effectively to restore or maintain their nature and biodiversity value. For example, restoration of habitats with low productivity, for example heathland or chalk grassland is likely to need specialist breeds that can thrive on this type of vegetation. Restoration of other habitats, for example neutral grassland can be achieved by grazing with more commercial breeds of livestock. However, it may be necessary to ensure areas of better quality grassland are available to these stocks to ensure the economic viability of the farm system. Certain farming systems are also likely to be more beneficial to biodiversity than others. For example, extensive beef rearing systems are likely to be preferable to modern dairy production.

Grazing and grassland management on low productivity habitats and the restoration of these habitats using livestock as a management tool is a specialist area of expertise. Whereas many farmers may have very valuable skills, it may be that there is a specific need for training and provision of information to assist in developing skills in this specialist area.

8.3 Public access

Much of the grassland and grazed habitats of the Island has public access along foot paths and bridleways or more generally as open access. This can create a number of problems to livestock managers, from gates being left open and from dog worrying of livestock. The public can also be seriously concerned by the prospect of walking in places where livestock are present. This can make it difficult to restore grazing to habitats if livestock have been absent for a number of years. These difficulties can be largely overcome with better public information and wardening, but this requires considerable time and resources.

8.4 Weed growth and habitat stabilisation

The restoration of grassland and grazed habitats often passes through a phase in which soil fertility and disturbance is sufficient to create ideal conditions for the growth of 'weed' species with ragwort, creeping thistle and dock causing the most significant problems. As the natural grassland or grazed habitat becomes re-established the weed species naturally decline. However, it is not generally acceptable to allow these high weed infestations to persist for the period it takes for the new equilibrium to establish, as this might take five years or so. In the meantime, it is necessary to control these weed species with well-targeted herbicide use or by other means. This can be expensive and time consuming and often relies upon the use of specialised equipment such as ragwort pullers or weed wipers.

8.5 Habitat fragmentation and loss of ecological continuity

Many species require a minimum area of habitat in which to maintain sustainable populations, this is particularly true for birds such as barn owl, skylark and nightjar.

Other species have poor powers of dispersal and hence cannot colonise new habitats unless they are close or contiguous with existing habitats, for example some chalk grassland butterflies such as the Adonis blue.

As has been mentioned, the natural recolonisation of grassland and grazed habitats with a more botanically species-rich sward is also dependent upon a nearby source of seed and plant propagules. The current state of habitat fragmentation may mean that intervention will be required to restore species diversity to such sites through the re-introduction of seed and other plant propagules from appropriate donor sites. These are likely to be the remaining SSSI and SINC, which retain semi-natural vegetation and makes their conservation even more critical for the future.

8.6 Implications of Foot and Mouth

We are yet to see how the foot and mouth outbreak will affect farming and grazing livestock management on the Island. There may be positive as well as negative implications for promoting better management of grassland and grazed habitats for nature conservation. These might include:

- It may become difficult to obtain suitable stock and there may be a further decline in the numbers of people with suitable stock management expertise.
- There may be greater impetus behind developing local slaughter facilities and
- There may be more government initiatives to assist local agricultural production and environmentally friendly farming

It will be important that farmers and nature conservation land managers give clear and unambiguous advice to government on the requirements for the future of livestock farming on the Isle of Wight.

8.7 A forum for considering the issues

It is suggested that a **forum** needs to be set up which would include organisations and individuals with an interest in developing more biodiverse grassland and grazed habitats on the Isle of Wight. This might include organisations such as the National Trust, National Farmers Union and Wildlife Trust, together with individual farmers. The Forum would enable members to share experience, exchange ideas and expertise. The Isle of Wight Woodland Forum has shown the value of such an

approach. As a first stage in the development of the Forum, a short newsletter could be produced for wide circulation that sets out the purpose and objectives of the Forum. This would aim to encourage interested organisations and individuals to attend an evening meeting. The meeting would aim to expand on the ideas in the newsletter and draw on specific experience from a similar project elsewhere in England using a guest speaker.

Ideas and reaction from the Forum could be taken forward through to the development of the individual HAPs. In this respect, the proposed grazing and grassland forum would act in a similar way to the Woodland Forum in that the forum will act as an umbrella group in which to consider common issues relating to a number of habitats.

9 Potential for biodiversity gains

There is huge potential to achieve biodiversity gains from restoration of grassland and grazed habitats on the Isle of Wight. For instance, there are large areas of semi-improved neutral grassland in the north of the Island that could be reverted to more diverse species-rich unimproved grassland with appropriate management and incentives. There are also potentially significant areas of calcareous grassland, acid grassland, heathland and grazing marsh that could be restored. Restoration of biodiverse grassland and grazed habitats would also lead to reductions in habitat fragmentation and consequent improvement in species dispersal.

An initial appraisal has been undertaken to identify those areas or regions of the Isle of Wight that might bring the greatest biodiversity gains from the recreation of semi-natural grassland and grazed habitats. This has been based upon an assessment of the current distribution of remaining semi-natural habitats, the distribution of different farming systems being practised on the Island and the potential of existing grassland and other habitats to revert to a semi-natural state.

9.1 Regions of the Isle of Wight with highest potential for grassland and grazed habitat restoration

Neutral grassland

Three regions of the Island are considered offer the most potential for biodiversity gains from neutral grassland restoration and recreation as follows:-

- **North west Isle of Wight**
- **North east Isle of Wight**
- **Upper Eastern Yar Valley**

The **north west Isle of Wight** region extends from Cranmore in the west to Parkhurst Forest in the east and is bounded by the coast in the north and the main Newport to Yarmouth road in the south. It embraces the extensive neutral grasslands that survive around Newtown Harbour together with the grass heaths of Cranmore. The farming systems in this part of the Island still rely on livestock farming of permanent pasture with a mix of dairy, beef and some sheep enterprise. Providing there are sufficient incentives, there is considerable potential for these

types of enterprise to incorporate areas of low intensity, extensive grassland management within their farming systems.

In the **north east of the Island** there are fewer areas of remaining unimproved neutral grassland although several small meadows occur within the catchments of Palmers Brook and Wootton Creek. These include Wootton Common, Staplers Heath, meadows associated with Kittenocks Copse and meadows and species rich verges around Littletown south of Wootton. The farming systems in this part of the Island are also based on livestock rearing with a mix of dairy, beef and sheep farming associated with permanent pasture.

The third target region is the complex of neutral grasslands in the **upper eastern Yar Valley** centred on Wydecome. This comparatively small region of the Island is bounded by the chalk downs and upper greensand ridge to the south and west and by the wetlands of the Yar Valley to the north. It has a diverse countryside of small hedged fields that could be restored to more species rich neutral grassland.

Calcareous grassland

Two regions of the Isle of Wight seem most appropriate to target for calcareous grassland re-creation.

- **Eastern chalk ridge**
- **Central chalk plateau**

The **eastern chalk ridge** extends from Newport to Culver Down. It includes many fragments of chalk grassland including relatively extensive areas on Arreton Down, Brading Down and Bembridge Down. There is much potential to link these and many smaller isolated fragments of calcareous grassland by chalk grassland re-creation schemes both on the southern and northern slopes of the chalk ridge. A decline in stock farming systems to the south of the chalk ridge in particular may hinder chalk grassland restoration in this part of the Island.

The **central chalk plateau** of the Island between Chillerton and Gatcombe in the east and the Calbourne to Brightstone road in the west has seen the greatest destruction of chalk grassland and associated acid grassland and heath over the last 150 years (an estimated 790ha or 52% of all chalk grassland loss on the Island over this period¹). Many fragments of these habitats remain both along rides and in clearings within the plantations of Brighstone Forest and on the steep slopes of the plateau. Farming systems in this part of the Island still rely on sheep rearing and other livestock enterprises and have potential for adopting more extensive grassland management systems.

Acid grassland and heath

Four areas of the Island offer the greatest potential for heathland and acid grassland restoration.

- **Parkhurst Forest**
- **Brighstone Forest**
- **Headon Warren**
- **Bleak Down**

¹ This includes acid grassland and heathland occurring on the chalk downs

Parkhurst Forest still retains much heathland vegetation along its rides. Heathland also rapidly re-colonises forestry clearings, particularly in the south of the Forest. There is much potential to increase this area and link it with the restoration of wood pasture in the north of the Forest. This would have wide biodiversity benefits for both habitats. The Forest is also state owned and part is notified as SSSI. Restoration of favourable condition within the SSSI may require restoration of grazing to the wood pasture, which could be linked with heathland and acid grassland restoration in the Parkhurst Forest SINC.

Brighstone Forest falls within the central chalk plateau described under calcareous grassland section. The re-creation of heathland and acid grassland within the forestry plantations of this region of the Island could be combined with the recreation of calcareous grassland. It would also have considerable archaeological and landscape conservation benefits.

Headon Warren once extended over a considerably larger area of land on its southern side, and linked with neutral and acid grassland to the chalk ridge of Tennyson Down. Agricultural intensification resulted in the destruction of much of the heathland between Headon Warren and the B3322 and the acid grasslands between this and the Down. The entire area is owned by the National Trust and has much potential for acid grassland and heathland re-creation.

Bleak Down was the richest area of heathland on the Island until the 1960s. In the 19th century heathland extended from Bleak Down to the west to link with the Wilderness and Cridmore Bog. Heathland vegetation in this part of the Island is now restricted to a few relicts but there is much potential to recreate heathland on the restored surface of the rubbish tips that have destroyed the area. This could be linked with the valley mires of Cridmore Bog and the Wilderness to the west and the seepage mire of Bohemia Bog to the north. Heathland and acid grassland re-creation in this part of the Island is perhaps the most difficult given the current land-use patterns but the gains are potentially highly significant.

Fen, mire and marshland

There is an urgent need to improve the management of existing fen, mire and marshland sites to return them to favourable condition. In addition, there is huge potential to restore other wetlands on the Island that have become invaded with scrub or other smothering vegetation. There is also considerable potential to further increase the area of these habitats particularly in the **Eastern Yar valley** upstream of Alverstone to Whitwell. This section of the valley already contains many fragments of marshland and mire vegetation that could be extended and linked to form more contiguous habitats. The agricultural systems in this part of the Island are often based on arable farming and hence it is difficult to link these often-narrow valley habitats with adjacent better quality grazing land. This forms a significant constraint to the restoration of these habitats.

9.2 Coastal grazing marsh and saltmarsh

Although there is a need to restore condition to many grazing marshes and possibly some saltmarshes through appropriate grazing management there is no requirement for re-creation of these habitats.

9.3 Wood pasture and parkland

There are two priority areas of wood pasture restoration and re-creation on the Island, as follows:

- **Parkhurst Forest**
- **America Wood**

Parkhurst Forest has already been mentioned as a prime region of the Island for heathland re-creation. It also offers the greatest potential on the Isle of Wight for wood pasture restoration. It retains many features of its former wood pasture ecology including a rich epiphytic lichen flora, dead wood invertebrate fauna and bat fauna. Wood pasture is sufficiently intact within this site to need restoration and not re-creation.

America Wood is unfortunately rather small and isolated from adjacent areas of former wood pasture, such as Apse Castle Wood and Borthwood Copse. This region of the Island does however have potential for wood pasture re-creation although this would require considerable financial incentive and agreement between landowners.

In addition to the restoration of wood pasture there is also much potential for parkland recreation and restoration. The prime candidate would be **Nunwell Park**; this retains the best collection of ancient trees on the Island. These are set within a parkland of improved pasture and arable. Studies have shown the long-term detrimental impact of this form of farming on the maintenance of ancient trees. There is much potential in this region of the Island to restore and re-create parkland. Other areas of the Island also support parklands of potential biodiversity importance although these probably need greater evaluation. Interesting areas include Osborne Park, Appuldurcombe Park and relict parkland associated with the former Fern Hill House at Wootton.

10 References

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Appendix 1

Condition assessment tables for calcareous grassland SSSI

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). CG1 sub-type attribute table

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
Unimproved calcareous grassland	CG1	*Extent	Total area (ha), mapped in relation to a site-specific reference level to be determined, in period May -June.	No reduction in area and any consequent fragmentation without prior consent	Recoverable reduction = unfavourable; non-recoverable reduction = partially destroyed.
		*Sward composition: cover of lichens.	Record % cover of lichen species, in period May -June.	Cover greater than 5%	Lichen species are an important part of the assemblage. Cover outside target indicates heavy disturbance eg trampling, competition from vascular plants or possibly the effects of atmospheric deposition.
		*Sward composition: positive indicator species	Record the frequency of positive indicator species in period May- June. <i>Acinos arvensis (Clinopodium acinos), Anthyllis vulneraria, Arenaria serpyllifolia, Carlina vulgaris, Centaurium erythraea, Galium verum, Helianthemum nummularium</i> , hoary-leaved <i>Helianthemum</i> spp. (<i>H. apenninum</i> or <i>H. canum</i> (= <i>H. oelandicum</i>)), <i>Leontodon hispidus</i> /L. <i>saxatilis, Linum catharticum, Lotus corniculatus, Pilosella officinarum (Hieracium pilosella), Sanguisorba minor, Scabiosa columbaria, Scilla</i> spp., <i>Sedum</i> spp., <i>Thymus</i> spp., <i>Trinia glauca</i> .	At least two species/taxa frequent plus at least four species/taxa occasional throughout the sward.	Choice of species related to NVC type and restriction to unimproved grassland, considered satisfactory when inside target. Among possible species that could be used, choice further restricted by ease of identification, visibility in recording period.
		*Sward composition: negative indicator	Record the frequency and % cover of negative indicator species. Record in	No species/taxa more than occasional throughout the	Invasive species chosen to indicate problems of

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
		species	period May-June. <i>Cirsium arvense</i> , <i>Cirsium vulgare</i> , coarse grasses eg <i>Holcus lanatus</i> .	sward or singly or together more than 5% cover	eutrophication and disturbance from various sources when outside target e.g. poaching, stock feeding.
		*Sward composition: negative indicator species	Record the frequency and % cover of all tree and scrub species including woody climbers, considered together, in period May-June. NB If scrub/tree species are more than occasional throughout the sward but less than 5% cover, they are soon likely to become a problem if grazing levels are not sufficient or if scrub control is not being carried out.	No more than 5% cover.	Invasive species outside target shows that habitat is not being managed sufficiently e.g. under-grazed.
		Sward composition: negative indicator species	Record frequency of negative indicator species in period May-June. <i>Senecio jacobaea</i> .	<i>Senecio jacobaea</i> no more than occasional throughout the sward	Frequency outside target indicates management problems e.g. over-grazing and trampling.
		Sward structure: average height	Record sward height in period May-June.	Sward 5 cms or less.	Outside target indicates insufficient removal of biomass through grazing.
		Sward structure: litter	Record cover of litter where in a more or less continuous layer, distributed either in patches or in one larger area, in period May-June.	Total extent no more than 25% of the sward	Outside target indicates biomass removal is insufficient e.g. under-grazed.
		Sward structure: bare ground	Record extent of bare ground (not rock) distributed through the sward, visible without disturbing the vegetation, in period May-June.	5 - 20%	Outside target indicates management problems e.g. under-grazing, trampling.
		Sward structure: localized bare ground	Record extent of localized bare ground around rabbit warrens.	No more than 0.05 ha ie approximately 20x20 metres	Outside target indicates rabbit grazing and disturbance levels are too high.

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). CG2 sub-type attribute table

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
Unimproved calcareous grassland	CG2	*Extent	Total area (ha), mapped in relation to a site-specific reference level to be determined , in period May-July.	No reduction in area and any consequent fragmentation without prior consent	Recoverable reduction = unfavourable; non-recoverable reduction = partially destroyed. Excludes bare ground associated with rabbit warrens (see below).
		*Sward composition: positive indicator species	Record the frequency of positive indicator species in period May- July. <i>Anthyllis vulneraria, Asperula cynanchica, Campanula glomerata, Cirsium acaule, Filipendula vulgaris, Gentianella spp., Helianthemum nummularium, Hippocrepis comosa, Leontodon hispidus/L. saxatilis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella officinarum (Hieracium pilosella), Plantago media, Polygala spp., Primula veris, Sanguisorba minor, Scabiosa columbaria, Serratula tinctoria, Succisa pratensis, Thymus spp.</i>	At least four species/taxa frequent plus at least three species/taxa occasional throughout the sward.	Choice of species related to NVC type and restriction to unimproved grassland, considered satisfactory when inside target. Among possible species that could be used, choice further restricted by ease of identification, visibility in recording period.
		*Sward composition: grass/herb ratio	Proportion of non-Graminae (“herbs”), in period May -July.	40-90%	Low proportion outside target indicates eutrophication, usually from fertilisers, or insufficient removal of biomass, leading to dominance by grasses.
		*Sward composition: negative indicator species	Record % cover of <i>Brachypodium pinnatum</i> and <i>Bromopsis erecta</i> , in period May-July.	Neither species at more than 10% cover	Outside target indicates insufficient removal of biomass e.g. under-grazing.
		*Sward composition: negative indicator species	Record the frequency and % cover of negative indicator species. Record in period May-July.	No species/taxa more than occasional throughout the sward or singly or together more than 5% cover	Invasive species chosen to indicate problems of eutrophication and disturbance from various sources when

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
			<i>Cirsium arvense</i> , <i>Cirsium vulgare</i> , <i>Rumex crispus</i> , <i>Rumex obtusifolius</i> , <i>Senecio jacobaea</i> , <i>Urtica dioica</i> .		outside target e.g. poaching, stock feeding.
		*Sward composition: negative indicator species	Record the frequency and % cover of all tree and scrub species excluding <i>Juniperus communis</i> , considered together, in period May-July. NB If scrub/tree species are more than occasional throughout the sward but less than 5% cover, they are soon likely to become a problem if grazing levels are not sufficient or if scrub control is not being carried out.	No more than 5% cover.	Invasive species outside target shows that habitat is not being managed sufficiently eg under-grazed.
		Sward structure: average height	Record sward height in period May-July.	Sward 2-10 cm.	Outside target indicates insufficient grazing or over-grazing.
		Sward structure: litter	Record cover of litter where in a more or less continuous layer, distributed either in patches or in one larger area, in period May-July.	Total extent no more than 25% of the sward	Outside target indicates biomass removal is insufficient e.g. under-grazed.
		Sward structure: bare ground	Record extent of bare ground (not rock) distributed through the sward, visible without disturbing the vegetation, in period May-July.	No more than 10% .	Outside target indicates management problems e.g. over-grazing.
		Sward structure: localized bare ground	Record extent of localized bare ground around rabbit warrens.	No more than 0.05 ha ie approximately 20x20 metres	Outside target indicates rabbit grazing and disturbance levels are too high.

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). CG3, 4, 5 sub-types attribute table

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
Unimproved calcareous grassland	CG3,4,5	*Extent	Total area (ha), mapped in relation to a site-specific reference level to be determined, in period May-July.	No reduction in area and any consequent fragmentation without prior consent	Recoverable reduction = unfavourable; non-recoverable reduction = partially destroyed. Excludes bare ground associated with rabbit warrens (see below).
		*Sward composition: positive indicator species	Record the frequency of positive indicator species in period May- July. <i>Brachypodium pinnatum</i> , <i>Bromopsis erecta</i> . <i>Anthyllis vulneraria</i> , <i>Asperula cynanchica</i> , <i>Campanula glomerata</i> , <i>Cirsium acaule</i> , <i>Filipendula vulgaris</i> , <i>Galium verum</i> , <i>Gentianella</i> spp., <i>Helianthemum nummularium</i> , <i>Hippocrepis comosa</i> , <i>Leontodon hispidus/L. saxatilis</i> , <i>Leucanthemum vulgare</i> , <i>Linum catharticum</i> , <i>Lotus corniculatus</i> , <i>Pilosella officinarum</i> (<i>Hieracium pilosella</i>), <i>Plantago media</i> , <i>Polygala</i> spp., <i>Primula veris</i> , <i>Sanguisorba minor</i> , <i>Scabiosa columbaria</i> , <i>Succisa pratensis</i> , <i>Thymus</i> spp..	<i>Bromopsis erecta</i> (if CG3) or <i>Brachypodium pinnatum</i> (if CG4), or both (if CG5) frequent plus at least two species/taxa frequent and four species/taxa occasional throughout the sward	Choice of species related to NVC type and restriction to unimproved grassland, considered satisfactory when inside target. Among possible species that could be used, choice further restricted by ease of identification, visibility in recording period.
		*Sward composition: grass/herb ratio	Proportion of non-Graminae (“herbs”), in period May -July.	40-90%	Low proportion outside target indicates eutrophication, usually from fertilisers, or insufficient removal of biomass, leading to dominance by grasses.
		*Sward composition: negative indicator	CG3 only: Record % cover of <i>Brachypodium pinnatum</i> , in period May-	No more than 10% cover	Outside target indicates insufficient removal of

Operational Feature (= ENSIS level 1)	Criteria Feature (=ENSIS level 2)	Attribute	Measure	Target	Comments
		species	July.		biomass e.g. under-grazing.
		*Sward composition: negative indicator species	Record the frequency and % cover of negative indicator species. Record in period May-July. <i>Cirsium arvense, Cirsium vulgare, Rumex crispus, Rumex obtusifolius, Senecio jacobaea, Urtica dioica.</i>	No species/taxa more than occasional throughout the sward or singly or together more than 5% cover	Invasive species chosen to indicate problems of eutrophication and disturbance from various sources when outside target eg poaching, stock feeding.
		*Sward composition: negative indicator species	Record the frequency and % cover of all tree and scrub species excluding <i>Juniperus communis</i> , considered together, in period May-July. NB If scrub/tree species are more than occasional throughout the sward but less than 5% cover, they are soon likely to become a problem if grazing levels are not sufficient or if scrub control is not being carried out.	No more than 5% cover.	Invasive species outside target shows that habitat is not being managed sufficiently e.g. under-grazed.
		Sward structure: average height	Record sward height in period May-July.	Sward 2-15 cm.	Outside target indicates insufficient grazing or over- grazing.
		Sward structure: litter	Record cover of litter where in a more or less continuous layer, distributed either in patches or in one larger area, in period May-July.	Total extent no more than 25% of the sward	Outside target indicates biomass removal is insufficient e.g. under-grazed.
		Sward structure: bare ground	Record extent of bare ground (not rock) distributed through the sward, visible without disturbing the vegetation, in period May-July.	No more than 10% .	Outside target indicates management problems e.g. over-grazing.
		Sward structure: localized bare ground	Record extent of localized bare ground around rabbit warrens.	No more than 0.05 ha i.e. approximately 20x20 metres	Outside target indicates rabbit grazing and disturbance levels are too high.