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Ashdown Forest - A review of grazing

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Ashdown Forest – A review of grazing

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Foreword

Ashdown Forest is the most extensive tract of heathland in southeast England. An exceptionally important area for wildlife, it provides habitat for a range of species characteristic of this habitat that are becoming increasingly rare. The site's importance is recognised in its UK level designation as a Site of Special Scientific Interest (SSSI) and at a European level by its designation as a candidate Special Area of Conservation (cSAC) for its wet and dry heaths and Special Protection Area (SPA) for its birds. As the government body responsible for nature conservation, English Nature has a duty to ensure that Ashdown Forest is appropriately managed for its international conservation interest.

Like all lowland heaths, Ashdown Forest needs to be managed to prevent the encroachment of scrub and secondary woodland on this rare habitat. Traditionally, heathlands were managed by a mixture of grazing and cutting of the vegetation. As traditional grazing has declined, many heathlands are now managed for their conservation value by mechanical cutting.

In recent years, there has been much debate throughout the UK about the most appropriate form of management for conserving heathland habitat and species. *English Nature Research Report,* No. 422 "Impacts of livestock grazing on lowland heathland" (Lake *et al* 2001) concluded that grazing is an appropriate management tool for lowland heathlands that can produce a greater biological diversity than mechanical management alone.

In 1985, following the decline in stock grazing by commoners, the Conservators of Ashdown Forest commissioned *A Feasibility Study into Grazing* (Cole and Knightsbridge, 1985). This work concluded that the most appropriate management for Ashdown Forest was a combination of extensive grazing and mechanical measures. Following an initial trial, in 1998, approx. one third of the heathland on Ashdown Forest, some 547 ha, was fenced and grazed, with a review agreed after five years. This document forms a part of that review and outlines the effects that five years of grazing have had on the ecology of Ashdown Forest.

The situation at Ashdown Forest, where part is grazed and part ungrazed, provides an ideal opportunity for a comparison to be made on the ecology of the grazed area with that of the mechanically managed area. English Nature commissioned this report to identify how successful grazing has been as a management tool, and to establish the most appropriate form of management for the future of Ashdown Forest. The Forest Ranger, Chris Marrable, has many years of experience at Ashdown Forest, and has comprehensively surveyed the entire area as part of his work for the Conservators. This has given him an intimate and detailed knowledge of the Forest, which puts him in an ideal position to write this report.

This report concludes that the grazed areas have an increased plant diversity and are far more structurally diverse than the ungrazed areas. Grazing has enabled bracken-mown areas to become heather *Calluna vulgaris* dominant stands where acid grassland would be the usual result. The grazing has also helped control Purple moor grass *Molinia caerulea.* Whilst scrub needs to be initially mechanically removed, maintaining grazing pressure will inhibit regrowth, and though Bracken *Pteridium aquilinum* still requires mowing within the grazed area, trampling by stock has enhanced the effect of mowing. The grazing has also allowed management to take place in areas too wet or steep for mechanical management. Breeding birds have increased within the grazed area, as well as a range of other important species including silver-studded blue, lapwing, and marsh orchid.

As a result of the findings in this report English Nature considers grazing is likely to be the most appropriate way of managing Ashdown Forest. Consequently a further, more detailed study is planned to provide scientific evidence to support and facilitate this approach.

Dr. Isabel Alonso
Heathland Ecologist
English Nature
June 2003

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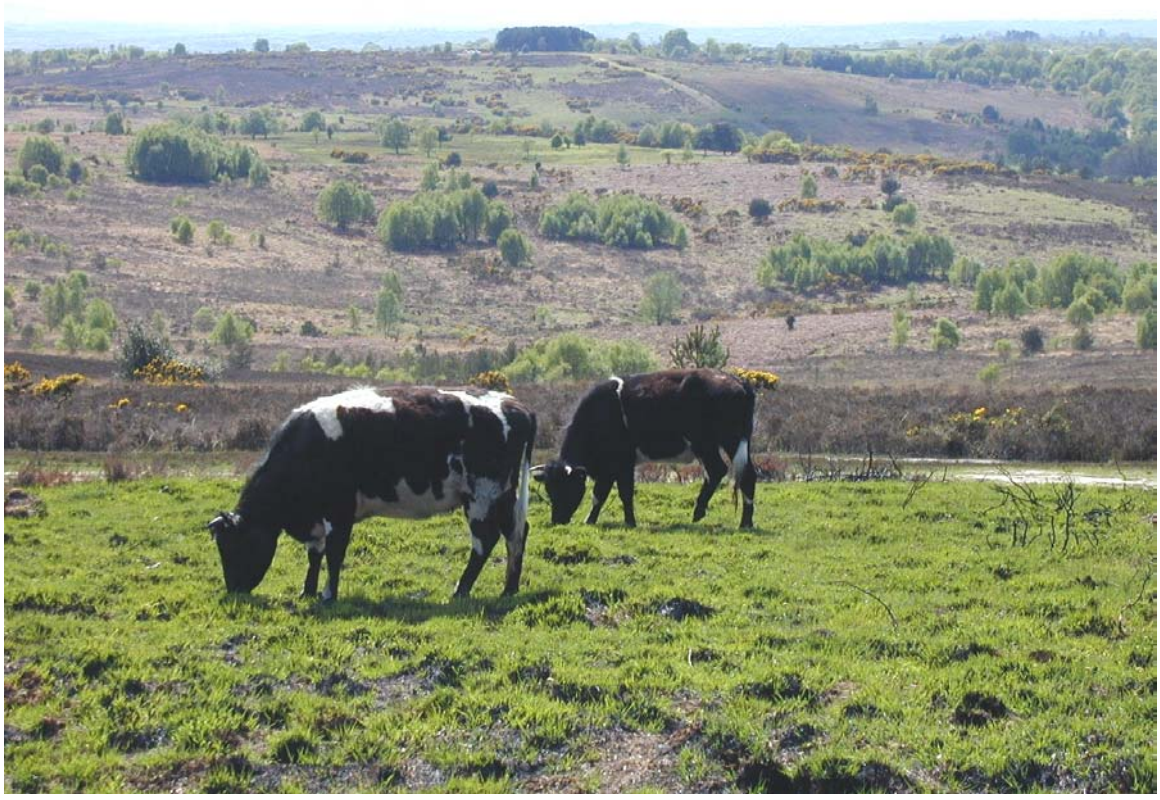
1. Introduction

Ashdown Forest covers an area of 2590 ha in the High Weald of East Sussex. It is owned by East Sussex County Council but managed by a Board of Conservators first established by Act of Parliament in 1885. It is all common land with some 730 Commoners holding rights to graze sheep and cattle, cut firewood and collect bracken and other litter. Until the Regulation of the Forest in 1885, it was the Waste of the Manor of Duddleswell and had little value to the Lord other than for hunting, quarrying and timber extraction. To the Commoners, the Forest was absolutely key to the viability of their pastoral lifestyle.

The decline in the traditional activities of the Commoners has lead to an accelerating re-afforestation at the expense of close-cropped heather-turf; bracken has also spread. The Conservators manage the Forest to maintain a balance of 40% woodland and 60% heathland.

The word "forest" in this case is being used in its Medieval sense. It is derived from the Latin "*foris*" and refers to land outside of cultivation or structured ownership and thus did not necessarily have a connection with trees or woodland. This may lead to confusion in the eyes of the public, who think that Ashdown *Forest* should be woodland and therefore oppose tree-felling.

Outside of ecological circles, Ashdown Forest is best known as the home of Winnie the Pooh.



Shetland Cattle on Ashdown Forest. C.J. Marrable

1.1 Historical context

There is a long history of grazing domestic stock on Ashdown Forest. Jenks (1967) and Irons (1982) give the following estimates of stock grazing on the Forest (Table 1), using contemporary documents as their sources (collected by Raper, 1885).

Table 1 Historical estimates of numbers of domestic grazing animals on Ashdown Forest

1273	Customary Tenants entitled to graze cattle
14th Century	2000 cattle; 400 pigs; (1000 deer)
1658	2746 cattle (the medieval Forest covered 5,800 ha, up to 1693)
1885	Raper took oral testimony from many Commoners in support of their claims for Common Rights over Ashdown Forest; invariably they claimed the right to collect bracken litter and, almost invariably, they claimed that they had grazed varying numbers of cattle and pigs. Some grazed horses on the Forest, but none admitted grazing sheep, which was illegal until the 1900s, despite many complaints that sheep were being grazed (Short, 1994).
1887	The *Conservators' Minute Books* (Conservators, 1887-) are full of applications for the grant of Common Rights in respect of properties more or less close to the boundaries of the Forest. In every case, the right to collect bracken (litter) was predominant (showing that stock was being over-wintered at home) and, for the closer holdings, stock was "turned out".
1962 – 67	Two small herds of cattle; 580 sheep.*

(* There were other Commoners grazing the Forest at this time; the Minute Books covering the Sixties and Seventies have references to incidents such as sheep worrying by dogs, encroachments made to allow cattle access to streams, sheep involved in traffic accidents and sheep being grazed without Rights, although no numbers are quoted. In 1967 there were, according to the Minute Books, 12 grazier Commoners.)

By 1983, the Commoners had almost completely ceased to turn stock out onto the Forest. There are several reasons for this decline:

1. the nature of farming had changed significantly since the World Wars, with extensive, low-input systems unable to compete with modern high productivity farming. There were only a few Commoners using farming systems which could benefit from their Forest Rights;
2. there had been a migration of workers from pastoral small-holdings, offering hard-work and low living standards, to the burgeoning industrial and commercial areas;
3. traditional grazing on open land was increasingly difficult in the face of commuter traffic and uncontrolled dogs.

The current cost of property with Forest Rights ensures that no new Commoners **dependent** on grazing livestock are likely to appear.

In 1985, the Conservators commissioned a study from Land Use Consultants into the feasibility of re-establishing safe grazing (Cole and Knightsbridge, 1985). The study concluded that a combination of mechanical measures and extensive grazing was the optimum management solution and recommended methods of implementation.

In 1989, the Conservators enclosed 40 hectares in the Millbrook area, under pressure from a Commoner to provide safe grazing, to test the response to fencing and grazing on the Forest.

In 1996, with the consent of the Department of the Environment (DoE), the grazed area was extended to 82 hectares, to include all the Millbrook valley.

In 1998, the enclosed area was extended to 547 hectares, covering most of the heathland on the south side of the Forest. Since 1998 the number of animals has built up to 900 sheep (all Beulah cross apart from 20 castlemilk moorits sheep) and 100 cattle (Welsh black and Shetland). These animals come off for lambing/calfing and shearing. The time they stay on Ashdown varies with weather conditions. If they start to lose condition they are also taken off, so there is no exact data on how many sheep/cow days per year have been in the grazed area.

There are a number of Commoners who are still in a position to benefit from the free grazing available to them, especially as agri-environment schemes can provide additional financial incentives.

There were five Commoners grazing at the time of the 1985 Feasibility Study (Cole and Knightsbridge, 1985). Twenty Commoners attended the initial meeting to assess interest in grazing their stock on the Forest in 1998, and other land-owners have expressed an interest in grazing animals since the initial meetings. Five Commoners have grazed stock on the Forest since 1996.

1.2 Recorded vegetation change

The decline in numbers of grazing stock coincides with, and is at least partly responsible for, a change in vegetation. Lake *et al* (2001), in a review of grazing for English Nature, describe "the massive decline in the agricultural grazing of lowland heaths …. as one of the major causes of the degradation and loss of biodiversity of European lowland heaths".

Postcards and photographs (see, for example, Kirby, 1998) from the beginning of the 1900s show an almost unrecognisable forest. The vegetation is generally very short; it appears to be composed of a grass-heath mix, with some scrub, probably gorse, but very few broadleaved trees. Records (Conservators, 1887) show that bracken must have been present in some quantity and was carefully conserved by winter cutting and control of summer fires. There are a few pine trees. The earliest aerial photographs (Ivan Margary undertook to aerial photograph the line of the Roman Road across the top of the Forest in the 1920s) reinforce this view; there was no woodland, virtually no trees and the clear definition of ground features shows that the vegetation was very short.

It is possible to study a chronological series of aerial photographs, analysing the composition of the vegetation over time. This work has been carried out by Jon Douch (2002), who looked at Gills Lap and two other areas of the Forest (amounting to 34% of the total Forest area) in approximately ten year steps, starting from 1947. His conclusion is remarkable: woodland has increased from 7.1% to 49.2% of the study area. This corresponds to an **annual** change of heathland to woodland of 0.78% (c.20 ha) of total Forest area. If this were to continue unchecked, the whole Forest could be wooded in 75 years.

In parallel studies of the whole Forest area (Marrable, in prep.), comparisons of four complete vegetation surveys from 1965 to 2000, show the same picture – a rapid invasion of open habitats by successional birch woodland.

Whereas lowland heathland is a rare habitat on which many specialised birds, insects and reptiles depend, secondary woodland has a wide distribution across the country.

The Conservators, representing the freehold owner of the land, along with statutory conservation bodies (particularly English Nature) have legal obligations to maintain the quality of the Forest heathland habitats. This is especially true as Ashdown Forest is not only a Site of Special Scientific Interest under national legislation but also a *Natura* 2000 site (Special Protection Area and candidate Special Area of Conservation) under European law. Extensive grazing is now considered by all conservation organisations to be an invaluable tool in heathland management (Lake *et al* 2001).

In spite of considerable local opposition, a large block of the Forest was fenced in 1998 to allow Commoners to graze their stock safely. It was determined at the time that the effects of the scheme should be reviewed after ten years. Subsequently, it was felt that ten years was too long and that a five year interim assessment should be carried out.

A "minor" assessment (ie not under-pinned by new research) is undertaken at this point because ecological changes are likely to take longer than five years to be apparent and because a "major" evaluation is scheduled for year ten (2007).

This document represents an overview of the effects of the grazing in the enclosure, primarily from an ecological standpoint, five years after its inception. In producing this overview, no new ecological work has been commissioned; rather, existing records have been analysed and subjective assessments evaluated.

1.3 Duty of Conservators

Whatever the ecological and social impact of the fencing and grazing, it is clear that the Conservators have gone a long way to fulfil their duty to protect the grazing rights of the Commoners (Ashdown Forest Act, 1974. Section 16.). The fact that few Commoners have taken advantage of the free summer grazing available to their stock is regrettable and leaves the Conservators dependant on one grazier for the provision of the majority of the stock.

2. Opposition to grazing

The grazing proposal was opposed for four broad "reasons"*, mainly associated with the necessity to fence. These are:

1. aesthetic reasons; degradation of the landscape;
2. reduction of access and loss of amenity;
3. opposition to the enclosure of the Forest;
4. that grazing will not achieve the predicted results.

This section addresses these causes of opposition and how they have developed as grazing was introduced.

(* these "reasons" are distilled from the documents circulated by the DoE, particularly the final "permission to fence" report of 1996).

2.1 Aesthetic

Nobody wanted to fence the Forest; the fence was expensive to install, is expensive to maintain and is visually intrusive. However, the Conservators considered that there was no alternative.

Most people would now agree that the fence is less visible as vegetation grows around it and is almost invisible in any wider view of the Forest. With the fences positioned alongside the roads, it can be argued that they become part of the road furniture rather than additional features. In other words, as the Forest is already blighted by roads (and other enclosure boundaries) the new fence causes little extra impact.

If the fence is to be extended or replaced, perhaps the Conservators should look to actively hide the fence, for example in a ha-ha or by appropriate screening, and make maximum use of existing boundary fences.

There is a balance here; the degradation of the landscape due to the fencing is countered by the fact that enabling grazing allows the maintenance and improvement of the historically, culturally and ecologically important open landscape of the Forest.

2.2 Reduction of access and loss of amenity

There is generous provision of access points (gates and stiles) to the enclosed area.
In response to requests from the public, one field gate has been repositioned and a new stile has been erected to improve access. There is an on-going maintenance programme to ensure that all gates are easy to use.

'Loss of amenity' was claimed by those who felt that they could not walk freely among the grazing animals. It is unlikely that they will have changed their opinion. However, there are increasing numbers of comments from people who like to see the Forest being grazed and who actively seek out the sheep and cattle. Many people enjoy driving across the Forest and seeing sheep and cattle grazing along the verges; this benefit is counterbalanced by those who are frustrated because their journeys are slowed by stock in the road.

The main reason that people do not enter the grazed area is because their dogs are likely to chase sheep or cattle. In some National Parks (eg Snowdonia) there is a positive attempt to train dogs and their owners to be safe with stock. If the Conservators intend to persist with the grazing, perhaps some kind of free stock familiarisation training for dogs should be considered.

Horse-riders and some dog owners have expressed the opinion that the fenced area has contained their animals when the two have become separated.

2.3 Opposition to enclosure

Those who were opposed to the "enclosure" of the Forest will not be placated.

2.4 Has grazing achieved the required effect?

Grazed area fenceline. C.J. Marrable

The rest of this report concentrates on the effects of grazing, beginning with observed effects from the practical managers of the Forest. The ecological evidence that grazing has had the desired effect is outlined below in Sections 4 and 5 of this report.

The South Chase Ranger (D. Pennington, pers. comm.) has reported the following practical benefits from the grazing, which occurs primarily on his Chase.

i. The need for "amenity" mowing (fire-rides, car-parks and picnic areas, road verges) has been dramatically reduced, because a short turf is created by grazing sheep.

ii. The efficacy of normal conservation operations is enhanced:

- There is no need to chemically treat cut birch stumps because grazing prevents regrowth (eliminating the requirement to repeat scrub clearance every five years); at the correct stocking rate, scrub invasion is halted.
- Grazing animals are attracted to the more palatable young growth under bracken *Pteridium aquilinum* which is exposed by mowing and the increased trampling reduces bracken recovery. (Bracken constitutes 16% of Forest vegetation and invades geriatric heathland; it has little ecological or amenity value and over 100 ha are mown annually to reverse its spread)

- Grazing has dramatically curtailed regrowth from oak stumps left after large areas have been flattened by the forest grinder. The reduced use of a tractor leads to lower diesel costs and lower pollution.

In effect, grazing makes heathland management a more sustainable proposition, where mechanical management costs are reduced. Indeed, innovative marketing of Forest produce could lead to grazing products achieving a profit. The Conservators should attempt to install sustainable (self-financing) management while conservation grants are at their present all-time high.

Despite only having 'legal' status as Commonable animals since the 1900s, sheep have shown to have particular benefit in controlling re-growth from cut birch stumps, rapidly leading to the death of the tree (without the use of herbicides). Several heathland managers favour ponies for heathland grazing, and the Conservators should consider this option.

3. Habitat change

With the exception of the data provided by Wirdnam (in prep.), the absence of quadrat-based data means that the following observations are qualitative.

Grazing pressure has been variable over the area of the enclosure. Heavy grazing has occurred in the southern end of the Misbourne valley and at Duddleswell. Heavy grazing also takes place at wild-fire sites. Under-grazing has occurred in the areas where rank vegetation predominates; fifty years ago these areas would probably have been burned to recondition the vegetation. Cattle in particular have traversed these rank areas and a low level of grazing has occurred; higher cattle stocking rates would probably see these areas grazed down.

An example of the effects of burning can be observed following the fire on the Old Lodge boundary. The area of the fire was very heavily grazed in following seasons, removing virtually all the purple moor grass *Molinia caerulea*, leaving a short cross-leaved heath *Erica tetralix* community. For comparison, an unburnt area just across a fire-break from the site of the fire has developed into tall, rank *Molinia* monoculture, which is hardly grazed.

Where grazing has occurred at a moderate to high level, changes in the structure of the vegetation compared with ungrazed sites are discernible at the micro-habitat level – there is an increased amount of bare ground; there is an architectural mosaic; there is an age mosaic; and there is an increased plant species diversity. There is no question that grazing leads to a reduction in homogeneity at an intimate scale. Ecologically, this is a much improved habitat compared with the large blocks of vegetation created by mowing and will favour a greater species diversity. As an example, silver-studded blue butterflies require flowering heathers for the flying adult, but bare ground or very short turf for the host ants to incubate the larva. Ashdown Forest particularly benefits from large-scale, extensive (low stocking rate) grazing because all the components of the heathland habitat can co-exist. (Heavy grazing of small sites has led to important local extinctions).

One of the important changes brought about by grazing is based on the palatability of the different species present. Purple moor grass and other grasses are selectively removed; this is reversing one of the problems which occurs on ungrazed areas, ie the invasion of heath by

grass. It also helps create heather *Calluna vulgaris* dominant stands where acid grassland would otherwise be created by mowing bracken.

Ungrazed Purple Moor grass *Molinia caerulea*. C.J. Marrable

Scrub is still a problem within parts of the grazed enclosure and will require mechanical removal. However, if the grazing pressure is maintained, scrub regrowth will be inhibited.

Bracken *Pteridium aquilinum* still requires mowing within the grazed enclosure. Trampling by cattle (and some grazing of crozier-stage bracken by sheep, as reported by Ranger Pennington) enhances the effect of mowing.

Grazing has effectively taken management into areas where mechanical access is impossible, due to wet ground or difficult terrain.

The effect of grazing on bog communities is notable. The wet areas seem particularly attractive to cattle where they have the effect of physically breaking up *Molinia* tussocks and reducing grass dominance by grazing. There is no mechanical way of achieving this.

A comparison of grazed and ungrazed mire vegetation on the lowland heath of Ashdown Forest.

Wirdnam (2003) carried out research for a degree project on the effects of grazing on eight Forest mires. Quadrat data were collected and subjected to statistical analysis. Her results can be summarised as follows: 1) grazing has caused a reduction of sward height which has allowed gullies between tussocks (of *Molinia*) to remain clear; this facilitates regeneration of other plant species; 2) there is a greater abundance and more species diversity of plants in the grazed areas; 3) the total number of plant species is higher in the grazed areas, to an extent that is unlikely to pre-date the grazing; 4) four tree species seedlings (*Betula*, *Quercus*, *Ilex*, *Frangula*) were found in the ungrazed sites but none in the grazed areas.

Grazed mire. C.J. Marrable

Nutrient enrichment is an important issue on heathland sites, especially where there is considerable nitrogen deposition in rainfall (UK mean deposition equals 16 kg ha^{-1} $year^{-1}$) (Power, 2001). Ideally, grazing animals should be folded off the heath at night, so that nitrogenous products are removed by off-site dunging. Where animals are kept on the site, the only fertility reduction is achieved by the animals' weight gain and the loss of nitrogen products through leaching and volatilisation. However, there is a benefit of grazing due to the translocation of nutrients in dung and the creation of fertility gradients and mosaics.

Some researchers believe that the hot-spots of high fertility can lead to increased invasion of birch *Betula* spp. but any such effect would be masked by continued grazing and there is no recorded evidence of this on the Forest.

4. Species reports

4.1 Butterflies

David King, West Chase Ranger, (pers. comm.) has been walking a butterfly transect within the grazed area for seven years.

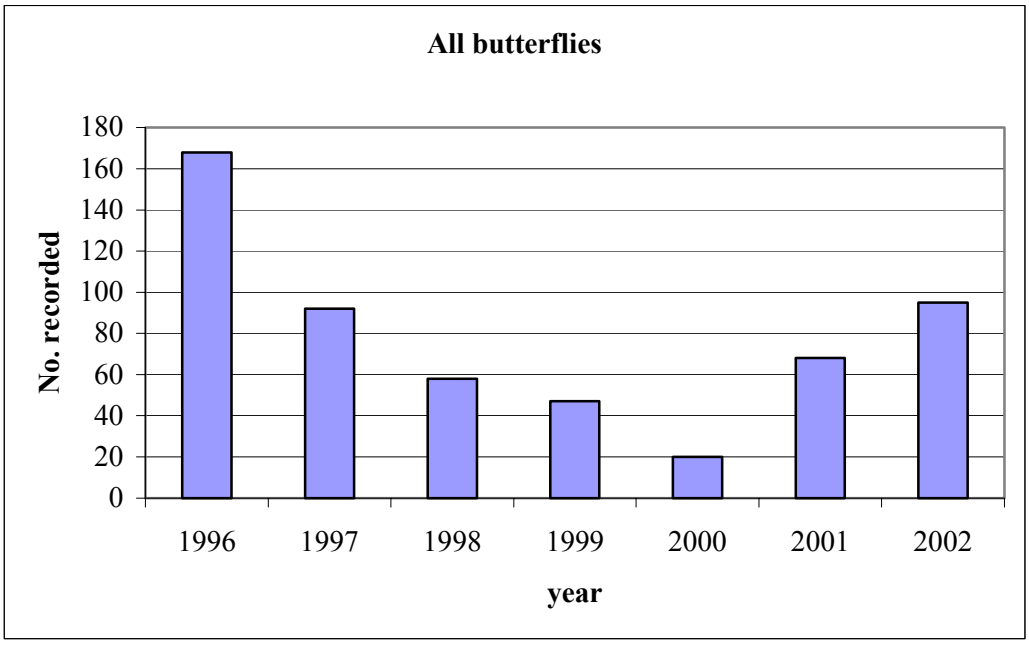


Figure 1 Total numbers of butterflies recorded in the Millbrook (grazed) Transect

Figure 1 appears to show a decline in butterflies in the grazed area, followed by a recovery. (*A note of caution must be applied to these data because they are not controlled and cover a short period of time*). These data do not take account of seasonal variations in numbers but do reflect a trend also observed in silver-studded blue *Plebejus argus*. These data can be explained as follows, backed up by subjective observations : prior to grazing, many butterfly species are breeding and feeding in the short turf of the rides, which are annually mown. When grazing begins, the rides are, in butterfly habitat terms, over-grazed. Butterfly numbers decline. Over the following years, the rides remain unsuitable but the surrounding vegetation is made into better habitat as it is grazed down. The butterflies recover. It has been noted by several observers that butterflies are less concentrated on the ride areas and are becoming

more wide-spread over the heath. This has particularly been noted in respect to silver-studded blues, which is a 'flag-ship' species for the Forest.

A wide-spread population is more natural and likely to be more resilient in the face of management or environmental changes.

High brown fritillary *Argynnis adippe* is a nationally declining species, recorded from the Forest in the 1980s. English Nature is supporting a reintroduction programme where suitable habitat can be found. Parts of the Forest, with appropriate grazing, could provide the correct conditions.

4.2 Other invertebrates

"…the heaths of Southern England are one of the most important habitats for invertebrates, supporting more than 50% of the British species in some orders" (Lake *et al* 2001*)*.

When the ten year review of the impact of grazing on the Forest is carried out, effort should be applied to evaluating the impact of livestock on invertebrate populations. Intuitively, it is expected that the increased age diversity, architectural diversity and species diversity, plus the bare ground and dung, will all have a positive effect on invertebrate numbers and species. With the large area grazed and the variable grazing pressure, the Forest enclosure should provide both breeding and feeding stations for a wide range of animals, reducing the risk of local extinctions caused by rapid habitat change.

Unfortunately, no data on groups other than Odonata and Lepidoptera is available at this stage; specialist recorders will have to be employed to carry out this work.

4.3 Orchids

Early marsh orchids *Dactylorhiza incarnata* occur at two sites on the Forest, some 200 metres apart, both within the grazing area. This species is found in only three other places in Sussex and is nationally uncommon.

In 2002, in response to a request from Dr. David Streeter, an area including some of the marsh orchids was fenced against the grazing because he felt that they should be protected until seed could be set. What actually happened is that even those orchids outside the fence, exposed to grazing, had a bumper year, with 50 spikes counted. This figure has only been exceeded once, in the 1980s, when John Gascoigne (from an article in the *Ashdown Forest News*) reported over 70 spikes.

The early marsh orchid has fluctuated over the years and it is likely that it thrives when the surrounding vegetation is maintained at a low, non-shading height and when the water-table is high. (Rank vegetation, especially scrub and trees, can lower the water-table due to transpiration). These conditions prevail after a fire and with an appropriate level of grazing.

An important post-script to this section: in June 2003, a new colony of marsh orchids (nine flowering plants) was discovered 150 metres east of the nearest known site. This is still within the grazed enclosure. It is strongly believed that this is a new colony, not one that was previously over-looked. It provides further evidence that extensive grazing is compatible with a diverse flora.

Grazed mire with orchid. C.J. Marrable

Early marsh orchid. C.J. Marrable

Autumn lady's-tresses *Spiranthes spiralis* occurs at only one site on the Forest, within the grazing enclosure. For years it was maintained by road-verge mowing. This has now been replaced by sheep grazing. Autumn lady's-tresses survives tight grazing in the form of a flat rosette; it flowers whenever the grazing pressure is reduced. The position it occupies on the Forest is typical of the species.

For the first time after several years of no flowers being found, three spikes were found in 2002, when the grazing pressure was relaxed in the aftermath of Foot and Mouth restrictions.

4.4 Marsh gentians

Table 2 Marsh gentian Populations

	Total spikes in grazed area	Total spikes in ungrazed area	Total
1998	251	53	303
2000	599	37	636
2002	524	72	596

In 2002, 88% of marsh gentians *Gentiana pneumonanthe* occurred within those parts of the Forest which have been more or less continuously grazed (Misbourne valley) or grazed since 1989 (Millbrook).

Marsh gentian population figures demonstrate a predictable change, ie increasing where adjacent vegetation is low and non-shading, with bare ground for seedling recruitment; declining where over-shading from rank vegetation stifles development and germinating seeds cannot grow. In these areas, gentians may survive in a vegetative form, not flowering, which would make recording extremely difficult. These plants would flower if they were "released" by a fire, mechanical removal of vegetation or grazing.

In the grazing area, despite the loss of some plants by eating and trampling, the numbers of marsh gentians are rising as the vegetation, particularly *Molinia*, is suppressed. Outside the grazing area, numbers are maintained in small, vulnerable populations as vegetation becomes more and more rank.

The 2002 colony numbers illustrate the population dynamics of Forest marsh gentians – of the 13 grazed sites, 11 are increasing; the two that are declining are the experimental enclosure area in Millbrook and the area east of the Airmen's Grave, where the vegetation is rank. Of the 11 ungrazed sites, all are declining (three have failed altogether) with the exception of the Trees car-park site, which was burned off, and has shown an increase from five to 58 spikes!

In support of the argument for the beneficial effects of grazing on marsh gentians, two previously undiscovered colonies were discovered in 2002, totalling 23 spikes, within the area which was winter-grazed.

A longer period of study needs to elapse before the evidence is complete, but it appears that marsh gentians thrive under the type of extensive grazing applied on the Forest. It is certainly true that without intervention, marsh gentians are swamped by more vigorous species.

4.5 Wild daffodils

Wild daffodils *Narcissus pseudonarcissus* occur on half a dozen sites across the Forest, mainly alongside the larger streams. In the Millbrook enclosure the wild daffodil population has been monitored for several years in response to a claim from a local resident that plants were being destroyed by cattle. The figures fluctuate widely, from a high of 970 flowers in 2000 to a low of 350 in 2003 but there are appears to be no correlation with grazing pressure. Certainly, there is no evidence that these colonies are threatened by the grazing and may be benefiting from increased bare ground created by trampling. Introduction of cattle too early in the spring could damage these plants.

4.6 Birds

The Ashdown Forest Bird Group provides fairly comprehensive records of birds on the Forest and has been doing so for the last decade. These data have not been published yet.

4.6.1 General effect

- The reduced number of dogs entering the grazed area will cause reduced disturbance and damage to nests of ground nesting birds.
- The reduced vegetation height will favour certain breeding species (eg waders), as will a mosaic of vegetation heights.
- Reduction of trees and scrub may reduce some bird populations.
- Increased invertebrate numbers associated with stock defaecation and increased plant diversity will favour insectivorous birds.

4.6.2 Specific effect

The data described below are the results of a standardised bird population monitoring census carried out by Ranger David King.

Figure 2 shows that there is an upward trend in breeding birds in a grazed area. This is particularly shown in Figure 3, which concentrates on four species which are important breeding Forest birds: reed bunting *Emberiza schoeniclus*, stonechat *Saxicola torquata*, Dartford warbler *Sylvia undata* and skylark *Alauda arvensis*. Additional breeding species which are doing well on the Forest are tree pipit *Anthus trivialis* and meadow pipit *Anthus pratensis* (contrary to the national decline) and linnet *Carduelis cannabina*. The grazing area is the only Forest site for breeding snipe *Gallinago gallinago*.

Figure 4 shows total sightings of three important Forest species (stonechat, Dartford warbler and skylark) which are benefiting from the grazing, and the same effect is seen if all species are included.

The only species which may have been identified as suffering in the grazing enclosure is nightjar *Caprimulgus europaeus*. The data is entirely subjective at this stage but it seems that the heathland landscape may be too open for nightjar breeding. This is probably not a criticism of grazing *per se,* rather that a return to landscape scale heathland will not favour breeding of this species.

Contrarily, it seems that, while breeding may be depressed, total nightjar records for this area are increased and this may be due to the increased invertebrate food supply associated with the grazing animals.

If the grazing is to be extended beyond the current boundaries, it would be necessary to take account of nightjar breeding habitat requirements, to ensure that there is no decline in breeding numbers (nightjars and Dartford warblers are the two species on which SPA status is predicated and English Nature would oppose any work which might lead to a decline in breeding populations for the Forest overall). This would mean leaving more 'woodland edge' in the form of clumps or individual trees. The same caution must be applied to 'landscape scale' clearance where grazing is not anticipated.

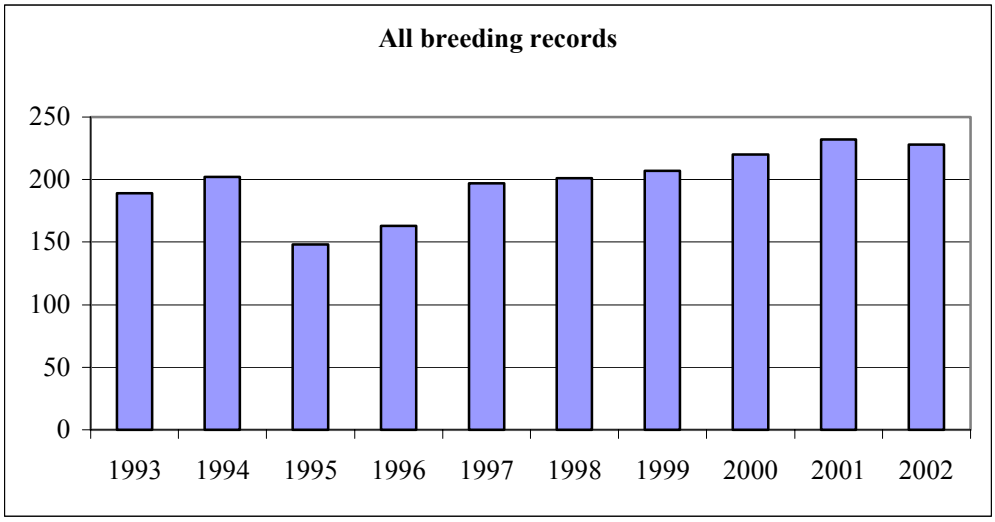


Figure 2 Numbers of Recorded Breeding Birds in the Millbrook Grazing Area.

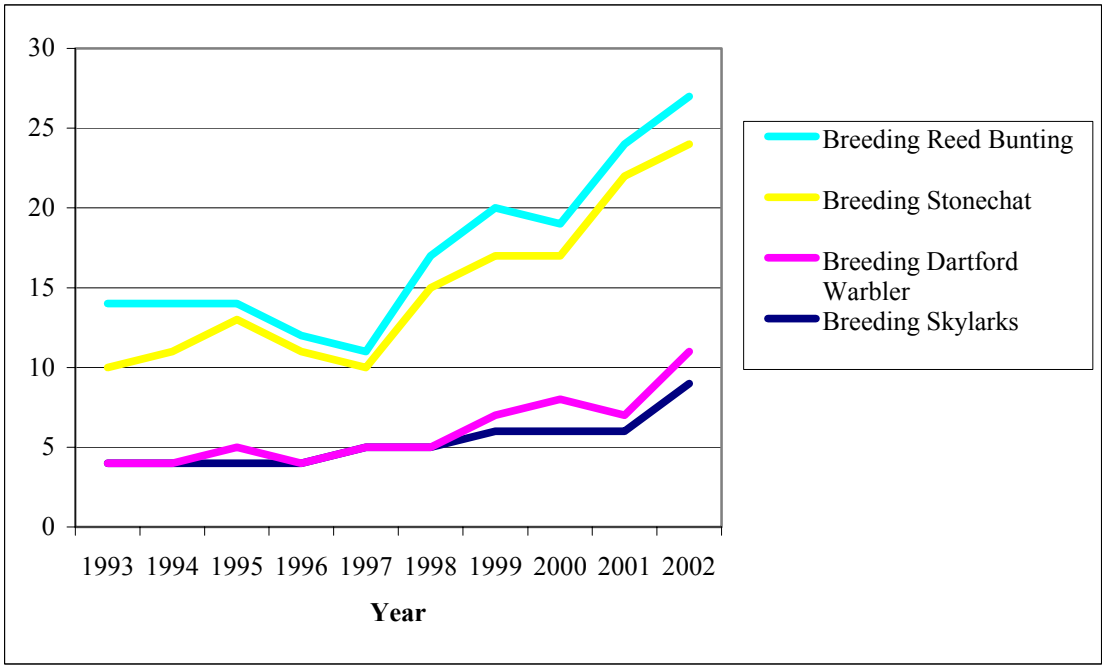


Figure 3 Breeding birds in the Millbrook grazing area

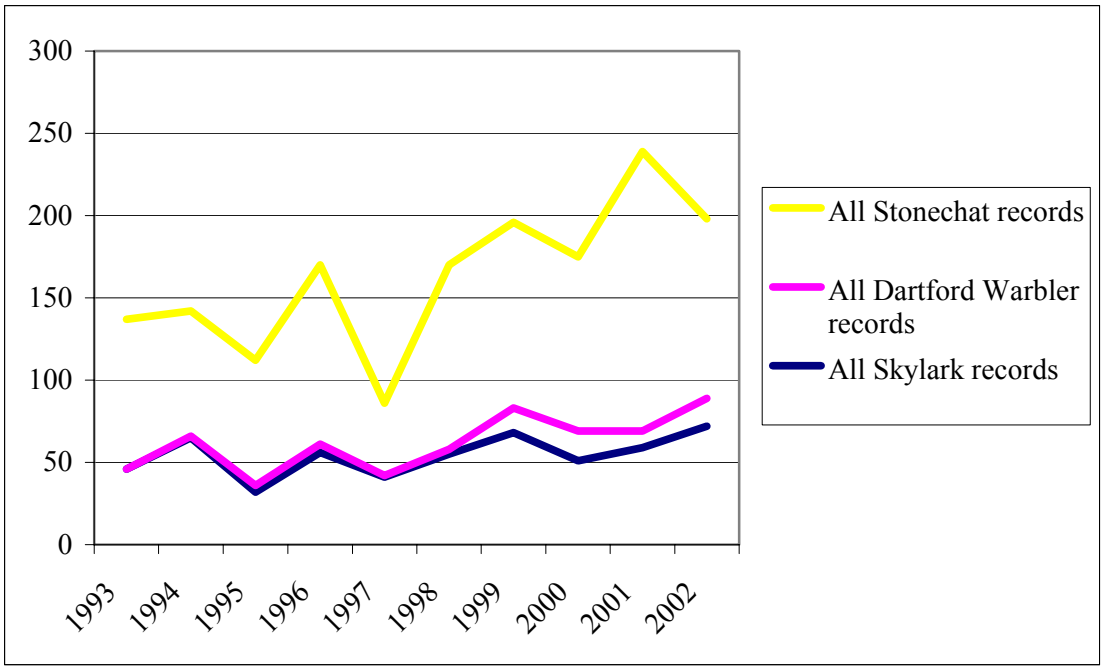


Figure 4 All sightings of three species of bird in the Millbrook grazing area

Lapwing

The single greatest success of the grazing has been the return after several decades of lapwings *Vanellus vanellus* to the Misbourne valley. These birds have not been seen on the ground in any other part of the Forest. They have nested for the last three seasons but 2002 saw the first proof of breeding success with up to three pairs nesting and a minimum of five young fledged.

The success is probably due to a combination of three factors – vegetation is low and variable; the presence of grazing animals has reduced dog disturbance, enhanced by the continuance of grazing through the winter and into the spring; increased food supply associated with livestock.

In spring 2003 there were two pairs of lapwings in the grazed area but after the beginning of June there were no further sightings and there is no evidence of successful breeding.

Table 3 Summary of grazing effects

Grazing	No grazing
Fences are undesirable on the open Forest	No fences
Economic cost associated with fences	No fences
Visitors response to livestock is ambiguous	No livestock
Reduced requirement for mechanical management; reduced costs	Management entirely mechanical
Fulfils a Duty of the Conservators	Fails to fulfil a Duty of the Conservators
Manages the heath in a way closer to traditional methods	Mechanised management makes the Forest look farmed
Potentially sustainable	Unsustainable; dependant on financial support
Enhances scrub clearance	Scrub clearance requires frequent re-treatment (every five years minimum)
Enhances bracken control	Bracken will take longer to clear
Reduces grass invasion	Grass invasion is a consequence of bracken mowing
Favours most heathland birds	Damage to nests by mowing
Increases invertebrate populations	Reduced diversity of invertebrates
Increases heterogeneity on the micro- scale; increased age, biodiversity and architectural mosaics	Increased homogeneity on a macro- scale
Creates areas of high and low fertility; leads to a small reduction in fertility over-all.	Fertility becomes homogeneous over the area
Increases ecotones on a micro- scale	Reduced ecotone; mechanical management creates hard edges
Prevents build up of rank and geriatric vegetation, including litter accumulation	Build up of rank and geriatric vegetation, including litter accumulation can only be achieved by fire or forage-harvesting

5. Conclusion

It is important to understand that the ecological changes brought about by grazing are subtle, but no less important for that. It is unlikely that any new plant or animal species will be found in the grazed area because there is no nearby source of heathland from which new species can colonise. Local extinctions are much more likely to occur. The grazing will bring about higher populations of important heathland species.

There is no less bracken or scrub in the grazing area because these problems are being addressed mechanically in the ungrazed parts of the Forest.

However, a detailed study will reveal a habitat which is more diverse and stable, being maintained in a way which is more sustainable in the long term.

It should be recognised that there are criticisms in the way that the grazing is carried out on Ashdown Forest:

- stocking rates are not adequately controlled to provide optimal grazing pressure;
- stock should ideally be folded off the Forest at night to transfer nitrogenous reserves off the heath;

- one part of the Forest (Misbourne) is subject to continuous heavy grazing;
- there is a demonstrable benefit to extending the grazing season to, for example, 10 months of the year;
- in some areas fire should be used to condition the vegetation prior to grazing.

These criticisms should in no way detract from the over-all benefit which has accrued from the existing scheme.

On the basis of this interim report, the Conservators should certainly begin to put into place the means by which grazing should be extended to other parts of the Forest heathland.

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Paul Glendell/English Nature 24,888
Middle left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Bottom left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Main: Radio tracking a hare on Pawlett Hams, Somerset.
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