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Ashdown Forest Grazing Action Plan

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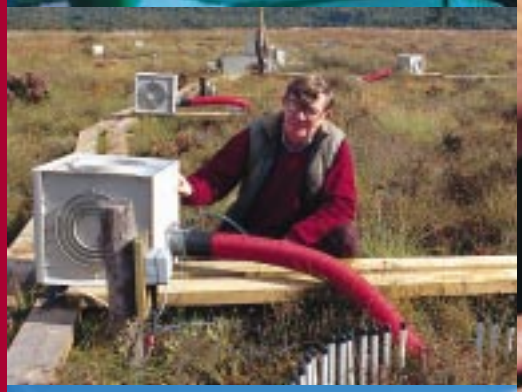

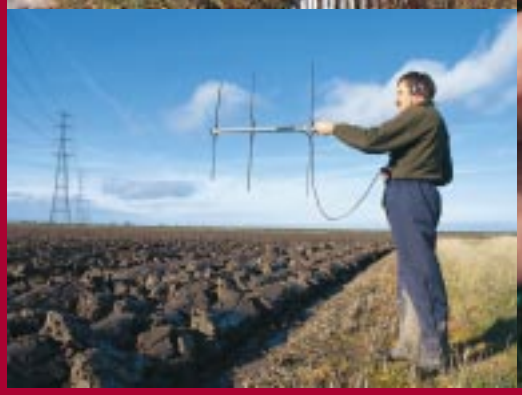

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Summary

In 1998, road-side fences were erected on Ashdown Forest to allow 547 ha to be grazed by free-ranging sheep and cattle. In ecological terms, this renewed grazing has been successful and the Conservators now wish to extend the grazing to other heathland areas. Many other conservation organisations working towards similar objectives were consulted in developing this Plan.

Traditional Forest practice in respect to grazing is considered, as well as the current grazing systems employed by the grazier Commoners. In this light, appropriate grazing systems can be devised.

Grazing is a valuable tool and it is most useful when combined with the other management operations which can be applied to heathland. The presence of grazing will not entirely eliminate the need for cutting, mowing, felling and burning.

The speed and volume of traffic precludes uncontrolled grazing across Forest roads. Any significant change to the road design to reduce the traffic problems will have effects beyond the Forest area and must be viewed as part of local transport strategies. Such measures would be prohibitively expensive.

If the Conservators are determined to carry out any fencing beyond enclosing the 100 acres permitted under the Act[1], they will have to apply to the Secretary of State for permission. A Public Enquiry would be expensive and time-consuming and should be avoided if at all possible, by convincing the neighbourhood of the benefit of grazing and incorporating sensible mitigation measures should fencing be necessary.

Robust surveying and monitoring (pre- and post-grazing introduction) will ensure that ecological objectives are being met in the long term.

Summary of recommendations

1. In commissioning this report, the Conservators have taken the first step towards extending the Forest grazing. The next step in this process is for the Board to **approve these recommendations** and to be familiar with the contents of this report.

2. It is important that, as much as possible, all those with an interest in the Forest should support the extension of grazing. There is some opposition to grazing, but there is much more opposition, both locally and nationally, to the fencing of commons. The question of how to demonstrate to the local neighbourhood (and beyond) that some fencing is necessary for the best management of the Forest should be left to public relations professionals. **Money spent at this stage could defray the cost of a public enquiry when consent for fencing is sought.**

3. Close-herding the animals can address the problem of stock on the roads, though employing additional staff is expensive. The number of animals that can be controlled

[1] Ashdown Forest Act 1974. Section 17(2) "The Conservators shall not…keep enclosed at any one time more than 100 acres of the forest without the consent of the Secretary of State"

by a herder is relatively small and some fencing is desirable to defend the A-roads and to create night-time enclosures.

4. **Fencing the Forest** is the obvious solution to controlling/protecting stock. This measure has to be viewed in the light of entrenched opposition to the enclosure of commons, the negative impact on the landscape of insensitive fencing and the perception that access to the Forest is reduced. There are mitigation measures which can reduce the problem but these measures are themselves expensive. Whilst a perimeter fence is considered, it is more realistic to break the Forest heathland into compartments and to treat these separately as resources allow. The four largest compartments total over 650 ha and should be the priority for new grazing initiatives. Smaller areas can be fenced using the 100 acres of enclosure permitted under the 1974 Ashdown Forest Act.

   This 100 acre enclosure should be used immediately. The benefits are:

   i) more heathland is grazed
   ii) winter grazing should be introduced, which has intrinsic merit but also offers help to existing Commoners having difficulty in housing stock through the winter.

   Initially, until larger grazing enclosures are possible, the 100 acres should be used to graze blocks within the highest priority compartments

5. The Conservators currently benefit greatly by not being stockholders. However, with the anticipated increase in stock numbers, this will change. In the short-term, limited numbers of grazing animals will be available by diverting stock from the existing enclosure and from transhumance. In the longer term, the **Conservators are likely to be directly involved in animal husbandry** and marketing. Cattle will be the mainstay of new grazing schemes. Sheep, despite their attendant management problems, will also be used. It is proposed that ponies should be grazed on a trial basis. Most upland or semi-upland breeds will thrive on Forest grazing and other factors, such as productivity, visibility, animal welfare and handle-ability, should be considered.

6. There are some options for funding, but **Stewardship Scheme capital payments would seem to be appropriate** for initial fencing projects.

7. The Conservators should **encourage the existing graziers to keep the right numbers of stock on the Forest**. The number of animals that the graziers can keep are determined by their winter carrying capacity (currently, no stock are kept on the Forest through the winter) and building a large barn for winter housing of cattle will help considerably. The Conservators should make the **acquisition of funds for the barn** a high priority.

8. The Conservators should be proactive in **acquiring land which would become the in-bye** for extended grazing schemes.

Contents

1. Introduction

Ashdown Forest covers 2467 ha of heathland and woodland on the High Weald in East Sussex. A vegetation survey carried out in 2000 found that there were 1000 ha of woodland, with the remainder being made up of various forms of heathland vegetation. (Marrable, in prep.)

The underlying geology consists of two main formations: i) Ashdown Sand, composed of silty sandstones, silt stones with some mudstone and shale; ii) Wadhurst Clay, composed of mudstones and shales, with some shelly limestone. The majority of the Forest lies on the Ashdown Sand and the infertile, acidic soil derived from this geology supports the heathy vegetation. Rainfall averages over 800 mm *per annum*, a locally high figure due to the topography of the so-called Forest Ridge. The soil, due to its small sand particle size and high silt content, is not as infertile or free-draining as other heathland areas over different geologies. These factors give rise to heathlands that are predominantly humid, relatively cold and with a tendency to re-afforest very rapidly once management is relaxed. Outcrops of Wadhurst Clay invariably coincide with woodland vegetation, usually oak standards with a hazel understorey.

1.1 Key events in the Forest's history

Ashdown Forest was "enpaled" (enclosed by a ditch and bank deer-proof fence) at the end of the 13th century by Edward I as a hunting area of 5000 ha.

In 1693, half the area was enclosed and sold off, with 2500 ha left for the benefit of the customary tenants (later known as the Commoners).

In 1885, the Forest was regulated under Commons Legislation and a Board of Conservators was established, primarily representing the interests of the Commoners.

In 1974, the fourth Ashdown Forest Act determined how the modern Forest would be managed – East Sussex County Council and Wealden District Council would help cover the Conservators' expenses in running the Forest in exchange for representation on the new Board. New bye-laws were written and the public was given free access on foot to the whole area.

In 1988, Earl De La Warr, the Lord of the Manor, sold the freehold of the Forest to East Sussex County Council, who placed it into a Trust. Ashdown Forest is all common land, with 730 registered Commoners. The total Commoners' grazing entitlement is 20,000 sheep, 4000 cattle and 300 horses. Due to repeated sale and division of Commonable land and apportionment of Rights, many Commoners may graze only a single sheep.

Grazing on the Forest probably reached a peak 100 years ago. It declined rapidly after the Second World War until it was effectively extinguished in 1984. By this time, increasing traffic volume and speed prevented free grazing on roadsides.

In 1989, the Conservators enclosed 40 ha of the Forest, using an entitlement stipulated in the 1974 Ashdown Forest Act.

In 1996, following the success of grazing within the first enclosure, the area was extended to 82 ha, with consent for the fencing having been obtained from the Secretary of State for the Department of the Environment.

In 1998, the fencing was extended to enclose 547 ha.

In 2003, grazing animal numbers reached 950 sheep (ewes and lambs) and 110 cattle (cows with single calves). These animals were owned and husbanded by two Commoners. This relatively high stocking rate reflects the high grass content of Forest heathland vegetation. Currently, there is grazing in the summer only.

The area managed by the Board of Conservators forms the greater part of the Ashdown Forest Site of Special Scientific Interest (SSSI). The same land is designated as an EU Special Protection Area (SPA) and is a candidate Special Area of Conservation (SAC). It is central to the High Weald Area of Outstanding Natural Beauty. Grants for conservation work are obtained from the Department of the Environment Food and Rural Affairs (Countryside Stewardship Schemes), Tomorrow's Heathland Heritage lottery money (Weald Heathland Initiative) and English Nature. There are some 1000 ha of the Forest which are heathland but not grazed.

An English Nature Research Report (Marrable 2003) described the success of grazing on the Forest since 1998. It concluded that options for extending grazing onto the remaining Forest heathlands should be investigated. This investigation is supported by English Nature, DEFRA, the ESCC County Ecologist and the project officers of the Weald Heath Initiative. The Board of Conservators, in approving the recommendations of their Conservation Committee on 8 September 2003, agreed to move to extend the area of grazing on the Forest.

1.2 The Brief (from English Nature)

"The overall aim of this contract is to investigate the options by which extended grazing might be introduced. The Action Plan for Grazing Ashdown Forest covers the following issues:

- examine options for the ownership, type, husbandry, density and effect of different grazing animals;
- identify which areas of the Forest are both the most practical and beneficial to graze;
- explore various options for constraining the grazing animals within the Ashdown Forest boundary such as hefting and fencing;
- estimate all likely costs and sources of funding;
- recommend a course of action for introducing grazing.

The contractors will consult Commoners, other organisations with recent experience of introducing grazing into conservation areas, and possible funders. Statutory bodies such as the Highways Agency will also be consulted to establish their requirements so that these can be built into the action plan."

1.3 The Approach

1. Widespread consultation with other conservation organisations that have grazing schemes in place.
2. Literature search, particularly aimed at management rather than research.
3. Assessment of the existing Ashdown Forest grazing, including consultation with existing graziers.
4. Consultation with East Sussex County Council (ESCC) highways department.

2. Domestic Grazing on Ashdown Forest

2.1 Historical grazing

It is valuable to consider the last 100 years or so of grazing on the Forest. The information is primarily anecdotal and to some degree apocryphal!

In this period, most of the land which was entitled to Rights of Common over the Forest was held by a limited number of wealthy land-owners; much of this land was in the form of small tenanted farms (Short 1994). Over a period of time, following the Regulation of the Forest in 1885, many owners of local small farmsteads claimed Forest Rights and their land was registered as commonable. At the end of the nineteenth century, around 200 farmsteads were using their Common Rights over the Forest. The viability of these farms hinged on their use of the common for "pasturage by mouth" (grazing) and for litter for wintering stock indoors. The Right to estovers was a moot point as by this time there was little or no firewood to be cut, with the possible exception of gorse.

The Commoners' system, which has parallels across Europe, was as follows: stock (cattle and pigs only, until sheep were permitted at the end of the 19th century) were grazed on the Forest through the summer, while in-bye[2] land was kept for fodder (hay) production; in the winter, litter[3] was collected and used as bedding material for the stock being kept in byres and fed on preserved grass; in the spring, stock was turned out onto the common and the byres were cleared out, with the dung-enriched litter spread onto the in-bye land. According to Webb (2002) it is likely that the in-bye land would have had an arable component; this is supported by the fact that there were several small corn mills around the Forest.

Records show that summer grazing on some farmsteads was diurnal: cattle were led out onto the Forest in the morning and folded back onto the in-bye land in the evening (this certainly applied to "house cows" or milking cows) but it is not known to what extent this was a common practice. Animal behaviour suggests that returning stock to in-bye land would lead to increased fertility of owned land (and lead to a loss of nutrients from the common). Modern experience throws up some difficulties with this system. At Woolbeding Common, the National Trust has attempted diurnal grazing of heathland by six cows – it was found that the animals preferred the pasturage on their in-bye land to that offered on the heath and spent the day sheltering from the sun and ruminating, while they grazed the in-bye land at night.

[2] *in-bye* land is used throughout this report to refer to improved land more or less close to the farm; equivalent to *infield* land or several other colloquial terms. In-bye land would usually have been required for hay production and therefore not used for summer grazing.

[3] there is some confusion about "litter"; some Commoners use "litter" to include bracken, heather and other low scrub, "anything that will come to a scythe", while bracken on its own was referred to as "brakes".

This leads to a transfer of nutrients onto the common (Paul Bruce, *pers. comm*.). In 2004, the stock were left on the common for the weekdays and taken to the in-bye land only at weekends.

How would the Commoners overcome this problem of better grazing at home than on the common? The only solution appears to be that animals were actually kept indoors. This mirrors the *plaggen* system in the Netherlands, where sheep only graze the heathland for six hours per day and cattle were kept indoors permanently, with fodder brought to them (Webb 2002). There is at least one example of New Forest cattle grazing on the heath during the day and returning to the farmstead to be fed at night – these stock are at least partially dependant on supplementary feeding.

The suggestion of extensive diurnal grazing on the Forest was roundly dismissed by an experienced grazier Commoner (Henry Osborne, *pers. comm*.) on the grounds that it would take too much time to round up the animals every night and that the animals have to graze the heathland for prolonged periods in order to collect sufficient nutrients to survive. (Incidentally, a stockman at Epping Forest, close-herding Longhorn cattle, observed the animals grazing periodically throughout the night. See Box 1)

There is at least one nineteenth century record (Short 1994) of oxen being turned out on the Forest *at night* and brought in to work during the day.

In contrast to diurnal grazing, Short (1994) records descriptions of close herding of cattle; small boys were sent out every morning to find the stock which had been on the Forest over-night to prevent them from wandering away. It seems that after a period of time, the cattle stopped straying too far and the herding could be relaxed. In other words, the stock stayed out on the common throughout the summer. Similarly, Webb (2002) suggested that, like the New Forest, Ashdown Forest has a tradition of free-grazing, with animals left more or less untended for long periods.

The records edited by Short (1994) show that summer grazing was the norm but that some stock were left out through the winter. Winter grazing of heather may have been significant, though this is contradicted by recent experience, where wintering stock have seriously declined in the absence of supplementary feeding; perhaps old breeds were better adapted to the poor diet.

Whilst historical precedent should not rigidly determine current practice, it offers the following advice: diurnal grazing for large numbers of animals is impractical; winter grazing without supplementary feeding is impossible; winter grazing of small numbers of cattle being fed on sacrificial areas can be beneficial; stock should be housed through the winter to prevent damage to in-bye land; though hefting probably does not occur, the stock certainly develop home ranges, which can help with close-herding.

2.2 Current grazing system

Most of the current grazing on the fenced 547 ha of the Forest is carried out by one grazier Commoner and it will be instructive to analyse his operation. The figures used are for 2003:

2.2.1 Cattle

i) On the 547 ha, there have been a total of 130 cows (110 Welsh Blacks belonging to the main grazier plus 20 Shetland cattle belonging to the only other grazier). This figure includes followers but does not include the current year's calves.

ii) Calves are born in April following bulling in August.

iii) No bulls are allowed on the Forest and so the cattle are off for that period in summer.

iv) Cows go back onto the Forest with calves at foot 10 days after birth.

v) Cattle are normally brought in around the end of October and the calves are separated off.

vi) Cows calve for the first time at three years and will have up to four calves.

vii) A Simmental bull was used in 2002 to improve the saleability of the carcass; as the animals are not over-wintered on the Forest, hardiness is less of an issue. An Aberdeen Angus bull is also under consideration.

Feeding cattle in winter

viii) The grazier uses two big bales per day for 180 days = £2520.

ix) An unspecified quantity of concentrate is fed at £140 per ton.

2.2.2 Sheep

i) There have been up to 950 sheep plus lambs on the 547 ha. They are mainly Beulah, crossed with Texel rams.

ii) Tupping begins in November for lambing in March/April. No entire rams are permitted on the Forest.

iii) Shearing takes place in May. Most sheep will not go out onto the Forest until after shearing.

iv) First tupping occurs at *circa* 20 months.

v) Ram lambs sold as stores at Christmas.

vi) A ewe will generally produce five lambs, before being sold at seven years as a cull ewe or in-lamb ewe.

Feeding sheep

vii) 800 ewes will be indoors for 210 days (Oct – May).

viii) 150 ewe lambs will be indoors for 180 days (Oct – March).

ix) Total ewe days = 195,000.

x) Each ewe eats 700g (1.5 lbs) hay per day.

xi) A big bale weighs 350kg (780 lbs) and costs £14.

xii) 375 bales are required, costing £5250.

xiii) Concentrates are fed at 230g (½ lb) per day per ewe for 9 weeks = £1575.

xiv) Feeding cost = £6825 *p.a.*

xv) Additional cost, eg health care (pesticide* spray at £2 per ewe *per annum*) etc.

xvi) Lambs are sold in September for £18 per head; in December they can fetch £30.

*Chemicals used to achieve parasite control: dicyclanil for sheep; abamectin and levamisole for cattle. There are no current plans for the Forest to become "organic", though this would be a desirable goal from both ecological and produce marketing viewpoints.

Grants include Sheep Annual Premium, Suckler Cow Premium, Beef Special Premium, Slaughter Premium and IACS. All these will be subject to change under CAP reform.

2.3 Assessment

2.3.1 Benefit

i) The main Commoner has a life-time experience of grazing animals on Ashdown Forest.

ii) The Commoners have an indisputable Right to have stock on the Forest.

iii) The Conservators have to commit very few staff hours to the scheme and no specialist in-house skill.

iv) Neighbouring land-owners are obliged to fence against the Common.

v) The Conservators receive payment from DEFRA for managing the heath in this way. (DEFRA payments are due to change; the new payments could include money for close-herding.)

2.3.2 Detriment

i) The Conservators have little control over grazing pressure, grazing period or breeds used.

ii) The Conservators pay to support the graziers.

iii) The Commoners have reduced options in stock management – the numbers of animals that graze through the summer are, more or less, governed by the number that can be over-wintered.

iv) The Commoners are governed by strict commercial imperatives; conservation goals come a distant second. This means that lambing / shearing and bulling / calving operations delay the time before stock are out on the Forest. (A non-commercial herd/flock would over-come some of these difficulties.)

v) The large number of animals being handled by the main Commoner preclude some operations which could extend the grazing period on the Forest – for example, scanning pregnant ewes could allow "single lambers" to spend the winter out on the Forest, while "twin lambers" could be brought in for special feeding and care.

vi) Stipulations in the 1996 Application to the Secretary of State to erect fences, included at the time to appease objectors, removed some options which would have been desirable – barbed wire on the top of the fence, winter grazing and internal fencing.

vii) Sheep have presented far more difficulties than the cattle (worrying by dogs, road traffic casualties, escapees). In conservation (as opposed to commercial) terms the benefits of including sheep grazing have to be weighed against these difficulties.

There is a 2004 proposal, supported by English Nature, DEFRA and the Weald Heathland Initiative, to build a large open-span barn on land adjacent to the current grazing enclosure. This will allow the main graziers to keep up to 100 cattle indoors through the winter, boosting the numbers available for summer grazing.

Note: On 29 April 2004, seven Exmoor ponies were released into the secure enclosure at the Kings Standing police training ground. They are grazing an area of five hectares, contained by an electric wire and ribbon internal fence, and are being checked daily by a team of volunteer "lookerers". To date (July), they have settled well and are having a heavy impact on the vegetation, particularly the improved grassy rides. They have already been moved to graze a new area of the enclosure.

3. Objectives of heathland management

Heathland is a plagioclimax maintained by activities such as grazing, wood-cutting, turf and litter collection and burning. This traditional exploitation suppressed scrub invasion and subsequent succession. In ecological terms, this traditional use is neither good nor bad – it would be to the benefit of some species and the detriment of others. The evidence as to which species thrived when the Commoners were at their height is sketchy – personal diaries, floras and collections of birds' eggs and butterflies give us some clues. Early 20th century photographs reveal treeless landscapes of short turf, which would not support many of the bird species which are so valued today.

Where the absence of exploitation leads to afforestation and loss of heathland, management decisions have to be taken. A decision not to intervene will lead to a loss of this valuable habitat. However, once non-intervention is rejected, managers must make the more difficult decisions of how the heath should be managed.

Heathland managers must identify their objectives, whether these are expressed in terms of vegetation condition, habitat features or even species populations, and apply the appropriate techniques to achieve them. In most cases, a number of techniques will be used, including grazing.

"If grazing animals are to be used as management tools in such a situation it is not enough to refer to 'tradition' or 'more natural' as the justification for a particular management regime. We need to be much more scientific in our approach – *what* is it we need to provide in the habitat and *how* may this be achieved?" (Offer and others 2003).

It is also not sufficient for heathland managers to claim that management will aim "to improve the heathland".

Any *benefit* derived from grazing is only a benefit in as much as it helps to achieve the ecological (or economic or aesthetic) objectives that the Conservators may have set. There is no absolute benefit from grazing. For example, a high level of grazing may be beneficial to an ant species which requires very short vegetation but it will be detrimental to a spider which requires tall vegetation to support its web. The term "benefit of grazing" used in this report should be viewed in this light.

3.1 Common Standards - UK Conservation Objectives

It is useful at this point to refer to the "Common Standards" method of assessing the condition of designated sites (Alonso and others 2003). Within the so-called "Common Standards" framework there are a number of heathland "Conservation Objectives", which are defined by one or more attributes. If the Conservation Objectives are being met, then the site will achieve **favourable** condition. *There is no mention of the means by which Conservation Objectives should be met, ie grazing* may *not be a pre-condition of achieving favourable status.*

For lowland heathland, there are six attributes, general targets which need to be tailored to individual sites: habitat extent, bare ground, vegetation structure, vegetation composition, indicators of negative trends, presence of rare species (or species that are notable for a site, contributing to local distinctiveness). There are separate sets of conservation objectives for wet and dry heathland but it is sufficient here to combine the two in outlining what constitutes **favourable** condition:

Attributes	**Broad objectives**
1. Habitat extent	no unconsented decline
2. Bare ground	at least 1% and not more than 10% (open and sunny for dry heath; muddy and wet for wet heath)
3. Vegetation structure	dwarf shrubs cover 25 – 90%; total gorse cover <50%; European gorse <25% ericaceous growth phase composition: pioneer 10 – 40%; building/mature 20 – 80%; degenerate phase <30%; dead <10% *(Dry heath on Ashdown Forest in 2000: pioneer = 14%; building and mature = 51%; degenerate = 35%)*
4. Vegetation composition	at least two species of dwarf shrub at least *frequent* (DAFOR scale) at least one graminoid *frequent* and two *occasional* at least two desirable forbs at least *occasional* bryophytes and lichens % cover maintained; >10% cover of Sphagna for wet heaths
5. Negative indicators	there should be no functioning artificial drains (wet heath) <1% habitat heavily eroded <1% exotics <1% ragwort, nettles, thistles <15% trees/scrub <10% dense canopy bracken
6. Indicators of local distinctiveness	targets set on a site basis, eg marsh gentians, Dartford warblers

Note that this favourable assessment refers to habitat condition, and not to animals (except for 6). The assumption is that these habitat objectives, when met, will lead to optimum conditions for the widest range of heathland animals. However, comments from Inspectors

ruling on fencing applications at Public Enquiries strongly suggest that it is necessary to demonstrate the local benefits of grazing for as wide a range of taxa as possible.

3.2 Habitat Action Plans

The National Habitat Action Plan objectives for Lowland Heathland are: i) maintain all existing lowland heathland; ii) improve by management all heathland in unfavourable condition; iii) re-create by 2005 of a further 6,000 ha of heathland.

The Ashdown Forest targets (determined by the Conservators and reinforced in the *Biodiversity Action Plan for Sussex*) are to maintain the 60:40 ratio of heathland to woodland by extensive grazing where possible.

3.3 Summary of heathland management options

Table 1 gives a summary of the techniques used on Ashdown Forest for heathland management and their observed efficacy at achieving the habitat objectives outlined above.

Table 1. Summary of management techniques and their efficacy at achieving habitat objectives.

	A	B	C	D	E	F	G	H	I	J	Sus	-VE
Light Grazing*	2	1	2	2	3	2	3	2	3	3	1	-
Heavy Grazing**	3	2	2	3	2	3	3	3	2	3	0	---
Cutting /felling	3	3	1	1	2	2	1	3	2	1	1	-
Mowing	3	1	3	3	2	1	2	1	1	1	0	-
Rolling	1	1	3	3	2	1	1	1	1	1	0	-
Forage harvest	3	1	3	3	2	1	2	1	1	1	0	-
Burning (controlled)	3	2	1	1	3	2	2	2	1	3	1	---
Herbicide	3	1	3	3	1	1	1	1	2	1	0	---

A prevent scrub invasion
B reduce excessive established scrub invasion
C controlling the spread of bracken
D convert existing bracken stands to more valuable habitats where appropriate
E maintain or increase plant species diversity
F introduce and maintain **age phase** mosaics across heather and gorse dominated communities
G introduce and maintain **structural** mosaics across heather dominated communities
H introduce and maintain **structural** mosaics across gorse dominated communities
I encourage, where appropriate, the spread of heather
J create and maintain bare ground and very short vegetation

Sus = Sustainability: 1 = sustainable 0 = not sustainable

-VE some impression of how damaging the treatment might be if wrongly applied (- low, -- medium, --- high).

* Light grazing could be less than one cow per five ha
** Heavy grazing could be above one cow per ha (on dry heath, over-grazing could occur at lower stocking rates)

1 = No effect 2 = Some good effect 3 = Good effect

It is anticipated that "pulsed grazing" will be employed: periods of heavy grazing will be followed by reduced grazing pressure or periods of no grazing. This will result in desirable "disturbance regimes" and increased diversity.

It is clear from Table 1 that a number of techniques will continue to be applied alongside grazing to achieve good heathland management. For example, no amount of grazing will reduce the woodland cover. However, it is also likely that, for Ashdown Forest, optimal heathland management will not be achieved in the absence of the ability to graze. Lake and others (2001) conclude the following:

- "Grazing by livestock is an appropriate management for lowland heathland, to deliver biodiversity objectives".
- "Appropriate grazing can produce a greater diversity of habitats and thus a greater biological diversity than other management types such as burning or cutting".
- "Grazing impacts must always be considered in terms of the intensity of grazing and the livestock types used; negative effects, or poor achievement of targets can arise from inappropriate grazing".

Lake and Underhill (2004) make a further interesting observation: "…one multi-site study found that grazed areas had greater botanical species richness than areas mown or recovering from burns, with a higher incidence of low-growing and small forbs and grasses".

4. Ashdown Forest heathland management objectives

Sixty per cent of Ashdown Forest (approximately 1500 ha) is managed as heathland. There are not only statutory ecological targets and constraints which direct the management of the area but also non-ecological objectives.

4.1 Ecological objectives

In respect to Ashdown Forest, heathland management will be carried out to achieve two groups of objectives, in line with the Common Standards Conservation Objectives described above. Firstly, there will be effects on the habitats directly (numbers 1 to 5 above) and secondly, there will be impacts on species which are 'notable' for the Forest i.e. contributing to "local distinctiveness" (these may be species which have Species Action Plans, species which are mentioned in the SSSI or SPA citations or species which are otherwise important for the Forest).

4.1.1 1. Habitat effects

Management should:

i) prevent and reverse excessive scrub invasion (<15% scrub);

ii) reverse the spread of bracken and convert existing bracken stands to more valuable habitats where appropriate (<10% bracken cover);

iii) maintain and increase plant species diversity at small and large scales (including bare ground); also, maintain a diversity of *non-heathland* forbs, whether on lightly grazed rides, ungrazed road verges or waste ground;

iv) introduce and maintain age mosaics across heather and gorse dominated communities;

v) introduce and maintain structural mosaics across heather and gorse dominated communities;

vi) encourage, where appropriate, the spread of heather;

vii) maintain eutrophic ponds;

viii) maintain and increase oligotrophic, acid ponds; reduce disturbance.

4.1.2 Species effects

Management should:

i) provide over-mature heather stands with some short, dense building phase gorse; **(Dartford warbler)**

ii) provide bare ground (for nests), short vegetation for feeding, tufted longer vegetation and some perching posts; **(Woodlark*)**

iii) provide woodland edge/heathland interface with bare ground under individual trees; **(Nightjar*)**

iv) provide mature heather for roosting; **(Hen harrier)**

v) provide short vegetation and bare ground for seed germination; allow flowering and seed production on a regular basis; **(Marsh gentian)**

vii) provide bare ground or short vegetation for host ants; provide nectar source (eg *Erica cinerea*) for flying insect; **(Silver-studded blue butterfly*)**

viii) provide eutrophic ponds and reduce disturbance; **(Great crested newt)**
(not a heathland species but mentioned in the SAC designation)

ix) provide bog pools with boggy margins and Sphagnum.
(Small red damselfly; black darter dragonfly)

* Sussex Key Biodiversity Species associated with Heathland Habitat (Sussex Biodiversity Partnership 1998)

These species objectives are the minimum criteria by which the ecological effectiveness of grazing might be assessed. More detailed study at the species level, particularly of invertebrates, would give better determination of the effects of the current grazing and also inform the choice of grazing regimes which may be applied in the future.

4.2 Non-ecological objectives

4.2.1 Landscape

It is the policy of the Conservators to maintain the open character of the greater part (60%) of the Forest, preserving long views. At a basic level, this simply requires the mechanical removal of scrub and trees. However, grazing animals have been a part of this landscape for centuries and are a popular feature for many visitors. While this alone might not justify the continued presence of sheep and cattle, the fact that grazing is a more economic and sustainable way of reducing scrub invasion increases their value.

The Sussex Historic Landscape Characterisation Map will show Ashdown Forest as an essentially unenclosed landscape, despite its earlier "en-palement". In facilitating a return to free-ranging grazing animals, the Conservators have to bear in mind this tradition of an open landscape.

4.2.2 Cultural

The traditional life-styles of the Commoners have been intrinsic to the development and maintenance of the Forest vegetation. Sheep and cattle will continue to be grazed for as long as there are Commoners who wish to take advantage of their Right to pasturage. The Conservators have an obligation to protect such Rights.

4.2.3 Archaeology

Archaeology is often over-looked in this context but it is apparent that a cover of woodland not only makes a site less obvious but probably also changes the landscape in which many of these features were originally situated. Trees can also physically damage remaining archaeological features.

5. Grazing options

5.1 Grazing without fences

With the notable exceptions of Epping Forest, the New Forest (Box 1) (Box 2) and the Ashdown Forest C3 Stonehill Road (Figure 1), there are apparently no lowland heathland grazing schemes in Britain which do not involve fencing to separate stock from traffic.

There are two options for grazing without fences – making the roads safe for grazing stock to cross them (Traffic Calming) or to close-manage the stock and prevent their access to the roads (Close Herding).

Can the New Forest and Epping Forest experiences inform the re-introduction of grazing to Ashdown Forest?

1. The New Forest has never lost its widespread grazing.
2. Grazing on the New Forest continued on the roadsides as the traffic volume and speed increased; traffic accidents involving domestic stock are seen to be the fault of the driver. The RSPCA has helped to prosecute drivers who have failed to report

accidents. This is very different from deliberately re-introducing grazing alongside fast and busy roads where there will inevitably be some accidents.

3. Four hundred Commoners directly benefit from the grazing on the New Forest; only two Commoners directly benefit from grazing on Ashdown Forest. The Rights of the Commoners dominate the management of the New Forest, and other groups, such as motorists, dog walkers, campers, riders, must accommodate the grazing animals.
4. Epping Forest management is reluctant to fence but face similar (or worse) traffic problems to Ashdown. Their solution has been to close-shepherd their cattle. The number of cattle that one stockman can supervise has been uneconomically small.
5. The size of the New Forest means that species monitoring in any inclusive way (*ie* a wide range of species over the whole Forest area) is impractical. The Verderers still argue that the traditional management is the best ecological management and concentrate their recording efforts on checking populations of some notable species. Epping, like Ashdown, wish to put robust monitoring in place prior to new grazing regimes being introduced.
6. Epping and the New Forest ecologists are unequivocal about the high value of grazing.
7. Epping Forest successfully enclose cattle using temporary electric fences.

5.1.1 Traffic calming

It is probably true to say (though there are no survey data) that the majority of Ashdown Forest visitors and residents are happy to see sheep and cattle on the area but object to fencing. It is therefore important to determine whether or not it is feasible to graze without fencing.

Cattle and ponies graze on the New Forest in the absence of fencing on many of the minor roads. Traffic calming is restricted to a Forest-wide speed limit.

Epping Forest Commoners graze a small number of cattle with a linear fence which only prevents *direct* access of stock onto the road. Close over-looking has generally prevented the stock from wandering onto the road but the organisers of this scheme admit to sleepless nights, justified by the occasion when 36 cattle nearly ended up on the M25! Three fatalities resulting from road traffic accidents involving deer have been the impetus for the local Highways Authority to impose a 40 mph speed limit.

The Ashdown Forest C3 has been included within the grazed area without fencing for 5 years. In each of those years there has been an average of 20 sheep killed on the road. The C3 has one of the lowest traffic speeds of all the Forest roads (Figure 1).

Box 1. The Epping Forest experience

Jeremy Dagley, Epping Forest Ecologist, *pers. comm.*

Epping Forest is unenclosed. There is a long history of grazing, particularly of wood pasture under veteran pollards but also of heathland. Grazing by Commoners' stock ended in 1996, following a long post-war decline.

In 2002, 12 Longhorn barren cows were introduced to the area immediately adjacent to the Warren, the Epping Forest administrative centre. There was no perimeter fence but a two kilometre linear fence defended the busy A104 main road. The cattle are owned by a Commoner (who is also a Verderer) and he employs a stockman to look after them.

The animals are more or less close-herded, with the stockman checking on them at regular (*circa* 3 hour) intervals. They are corralled at night in a temporary, electric-fenced enclosure. The cattle quickly accepted the corral as a safe haven, despite the fence consisting of only a single electrified rope; also, the stockman soon learnt to predict the behaviour of the herd, which developed a regular grazing routine. Grazing can take place from April to November (no winter grazing rights).

In 2003, the numbers of Longhorns was increased to 50, with 36 employed to freely graze a 300 hectare block, while the remainder were enclosed onto smaller heathland areas.

In evaluating the 2003 grazing, it was decided to reduce the number of grazing animals back to 12 for 2004. This is clearly a retrograde step and reflects the following problems:

1. The cattle were nervous of people and dogs; they would not feed properly with people around to the extent that they were losing condition; they stayed as a group rather than splitting into sub-groups which would be the expected behaviour; they would return to their (albeit flimsy) enclosure for security when they felt threatened; in the end, the stock were returned to their enclosure at week-ends and during the day, and released to graze *at night*.
2. When the cattle were disturbed they were easily able to get onto busy roads.
3. One stockman could not control many free-grazing cattle, especially when they are held at different locations.
4. Epping Forest managers are opposed to enclosure by fencing; the concession of the linear fence was conditional on the fence being largely out of sight below road level and was "leaky" (secure against cow escape but easily negotiated by walkers and their dogs via squeeze gates at 20 metre intervals).

Overall, while recognising the problems, the grazing on Epping is considered to be a success. The desired vegetation changes (re-establishment of a browse line, scrub reduction, non-typical grass control etc) are being observed and the public are once again getting accustomed to seeing cattle grazing over the area. They now have to face the challenge of increasing the stock numbers and their grazing range to cover the rest of the Forest.

Box 2. The New Forest Experience

Jonathan Spencer, Forestry Commission Ecologist*, pers. comm.*

The New Forest is effectively unenclosed, although a perimeter boundary was established in 1964 to restrict the distance to which stock could roam. Within this boundary, there are fenced off enclosures to allow the Forestry Commission to manage commercial forestry operations.

The total area of open, grazed Forest is approximately 20,000 ha, including large parcels of woodland, "Ancient and Ornamental", within that figure.

In 2004, the domestic grazing stock consisted of 3000 ponies and 2500 cattle plus perhaps 200 sheep and 100 pigs put out for pannage in the autumn.

Additionally, there is a very large herd of fallow deer, 800 of which are culled *per annum*, 120 Red deer and smaller numbers of roe, sitka and muntjac deer.

The major roads (A31, A35, A337) are fenced off, as is access to the larger towns and villages. The minor roads are unfenced.

There is a blanket 40 mph speed limit over the Forest area, with lower speeds through the villages.

There are some 450 practicing Commoners. They pay a marking fee of £20 for each animal that they depasture, which covers the costs of the Verderers and the Agisters. The Agisters over-look the Commoners' grazing animals and can order the removal of unhealthy or badly behaved stock. A new Stewardship Scheme will pay the Commoners a headage rate for depastured cattle, ponies and pigs (£9 million over the next ten years).

The cattle are mainly single-suckle beef animals; they are generally not over-wintered on the Forest, though they have that Right. Those that are over-wintered are fed to maintain condition, with feeding taking place on "sacrificial" areas of woodland or bracken. Calves are sold to be fattened on better land. There is at least one example of diurnal grazing, with the cattle returning to the holding voluntarily in the evening.

The majority of ponies are out-wintered and rarely require feeding. Though the mares can be of any breed, the stallions must be pedigree New Forest ponies. The number of stallions licensed to be out on the Forest gives some control over the number of foals born. By reducing the number of foals, the market price can be maintained. In 2003, a breeding mare was worth £300 and a filly foal was worth £100.

Though a Head Keeper claimed that there were few problems with the ponies, there have been several biting and kicking incidents, including one fatality (a young boy kicked in the head). It is against the Forest Bye-laws to feed the ponies. The interaction between the ponies and equestrians was not seen as a problem except when the stallions were out.

Despite the road speed limits, there are around 100 domestic animals killed in the New Forest every year. The great majority of these are ponies. The Commoners seem to accept these losses and the attitude of the RSPCA is clearly that the fault lies with the motorists in causing these accidents.

The speed limit signs are low-key, and tell motorists to keep their speed "below 40".

Fences alone are not determining whether the *character* of the area is open or not, rather it is the combination of the fences and the surrounding landscape. Fences beside roads passing through open landscapes *may* not spoil the impression of "openness".

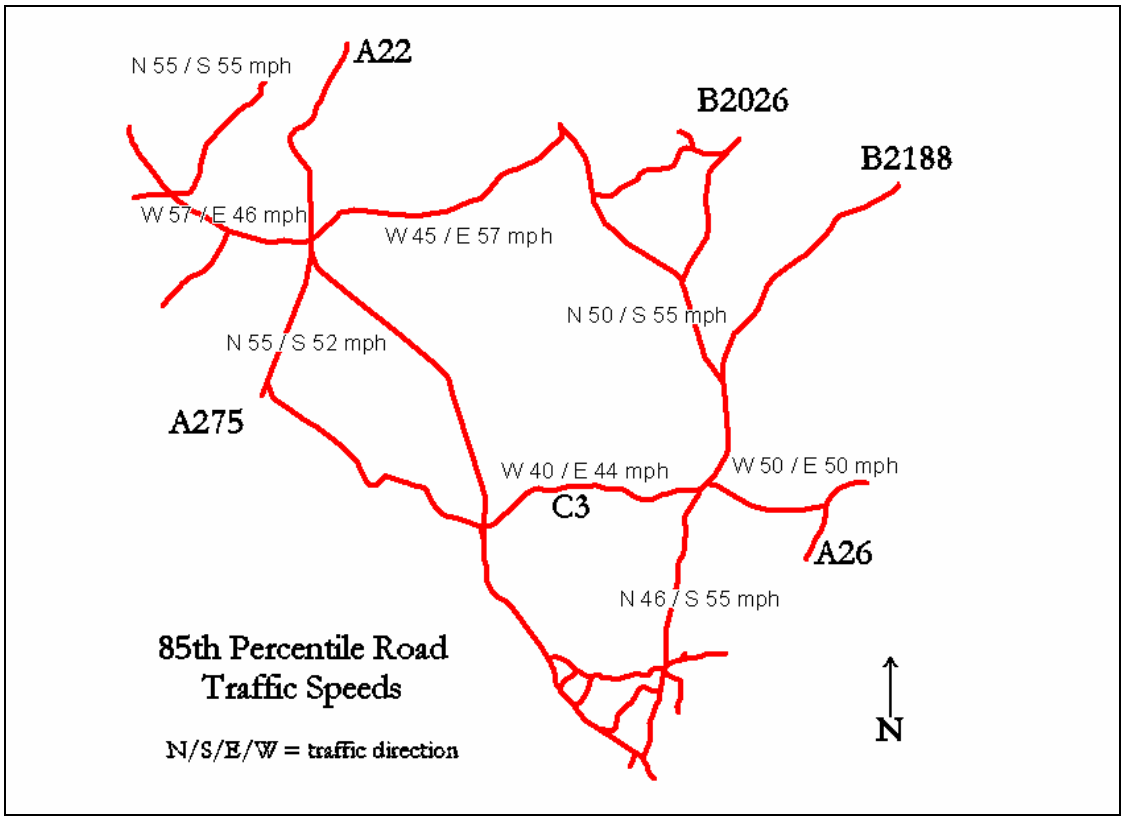

Figure 1. Traffic speeds on Forest roads (2004 data).

The traffic speed on the C3 is reduced due to the animals grazing on the verge, though this road is also narrower and more sinuous than most other Forest roads. In the absence of the stock, speeds would creep up closer to the 50 mph average (for the roads shown in Figure 1. It is difficult to justify the introduction of any new grazing regime which will inevitably lead to sheep being killed.

A meeting to discuss traffic calming on the Forest was held with the ESCC Department of Transport and Environment (Box 3).

Box 3. East Sussex County Council – Department of Transport and Environment

Summary points from a meeting held with those responsible for highway management in the Ashdown Forest area:

1. The presence of grazing stock on the roadside of the C3 has lowered the average traffic speed to around 40 mph. This is the lowest recorded figure for any of the Forest roads.
2. Despite this "low" figure, sheep and cattle are still killed by vehicles.
3. It is theoretically possible to reduce traffic speed below the existing figures by enforcing lower statutory speed limits, physical impediments such as single track roads or chicanes and education (particularly involving campaigning within local communities).
4. Any traffic calming on the Forest will have a greater or lesser effect on the surrounding roads network and has to be seen within the context of the Local Area Transport Strategy.
5. Traffic management in the Forest area should be seen as being beneficial not just for grazing animals and conservation but more widely as a benefit to people and their environment.
6. Research into traffic calming measures has been concentrated on urban areas and these solutions may be inappropriate in a rural setting.
7. The County Council are obliged to get best value from their financial resources and, as far as traffic management is concerned, this is likely to be achieved in urban or suburban situations rather than rural ones. Reducing traffic accidents which injure people is a higher priority than protecting grazing stock.
8. Any changes to the roads require staff time at County Hall as well as capital expenditure.
9. Grant aid may be available through "Interreg", a European scheme involving linked areas across EU countries. Traffic calming could be proposed to enhance the special character of the Forest area as a place of amenity and cultural landscape.
10. It has to be accepted that some roads will have to be fenced (A22, A275, Hindleap Road etc.) due to the weight and speed of traffic.

Conclusion: in the short term, the ESCC Department of Transport and Environment cannot be expected to put into place any new traffic measures on the Forest.

5.1.2 Close shepherding

The tradition of close shepherding stock on Ashdown Forest appears to be limited to sending small boys out in the morning to recover the cattle that had strayed too far during the night. The fact that the Lord of the Manor's reeve organised drifts (last one in 1869) to round up cattle and impound them until claimed by their owners indicates that the stock were not being closely herded (Short 1994). Within living memory, there are accounts of sheep being scattered across the Forest, wandering off the common and onto increasingly busy roads.

The New Forest Commoners pay a "marking fee" of £20 for every animal that they depasture; this money pays for Agisters, who patrol the Forest checking on the welfare of the Commoners' stock.

There are two main considerations for close shepherding:

1. **Stockman employment cost**

The actual cost of employing a Countryside Worker on Ashdown Forest is currently £17,500 *per annum*, including provision of a vehicle. One man alone, even with support from existing staff and volunteers, would not be able to manage a shift pattern which would require early starts and late finishes, week-end working and emergency cover. Two men would also be necessary for some of the handling operations associated with animal husbandry and movements. Realistically, a Senior Stockman could handle the administrative side of the grazing, including animal passports and movement records, marketing, volunteer over-lookers, grant applications and report-writing and also provide physical back-up to a Stockman, who would carry-out the day-to-day husbandry of the animals. The Stockman post could be summer seasonal. Assuming the Senior post is equivalent to a Ranger grade, the total employment costs are going to approach £40,000 *per annum*.

2. **Numbers and choice of stock**

The Epping Forest grazing scheme ended up with a very small cow/stockman ration (12:1). For such a scheme to be viable on Ashdown Forest, the ratio must increase dramatically in order to cover the additional stock required for grazing Ashdown Forest. Other measures would have to be implemented to make this option more acceptable: new stock should be biddable; cattle should not be matt-black but coloured, eg Belted Galloways (popular in the New Forest); fence major roads, so that, should the animals wander too far, the consequences should be less than disastrous!

The use of trained volunteers (a system developed by the National Trust and others) as over-lookers could reduce the burden on permanent staff.

5.2 Grazing with fences

5.2.1 Fencing options

Before looking specifically at Ashdown Forest, the options available should be considered in turn:

i) Perimeter fence: A permanent ring-fence enclosing the whole of the area.

ii) Fenced enclosures: Priority areas fenced.

iii) Road fencing: Permanent fencing of roads to keep stock and traffic apart.

iv) Temporary fence: Impermanent fences, probably electric, to create small(ish) enclosures.

v) Temporary enclosures and/or existing boundary fences combined with close-shepherding.

vi) Combination of the above.

It is important to recognise that there will be situations where temporary fences are appropriate (small sites, infrequent grazing) and other areas which demand permanent fences.

A "workable" example of a combination of these options could consist of: fencing the major roads, with close shepherding plus a temporary enclosure for night-time containment.

It is important to recognise that temporary fences will also require consent from the Secretary of State.

5.2.2 Types of fencing

Options for fence design:

i) Conventional stock-wire fence, with or without barbed wire. "Squeeze gaps" can be incorporated into the fence at regular intervals which will contain cattle or ponies but not impede human/dog/sheep passage (so-called "leaky fences"!). It may be possible to hide some fencing in the natural topography.

Cost estimated at £4.50 per metre, to include gates/stiles but not cattlegrids.
Cost of cattlegrids - £2000 for grids to Forest tracks and carparks
£10000 or more for roads

ii) Natural hedge (eg gorse or willow) – either planted or self-sown beside permanent, conventional stock-wire fences; this design has the advantage of hiding the stock fence and will (probably) extend the effective life of the fence, keeping the cattle from pushing the wire down. Vulnerability to fire can be reduced by mowing a break on either side of the hedge.

Cost as above plus £5 per metre for planting

iii) Electric fences – used to create temporary enclosures.

Cost to enclose approx. 4 ha:	£
1600 metres of wire	= 320
80 posts	= 220
energiser	= 220
battery	= 60
security box (live)	= 140
Total	= 960

iv) Ha-ha - a sunken fence, which will restrain animals but will not be apparent in the landscape. A conventional ha-ha, with a vertical face, would be too dangerous for public access land but a shallow ditch with a stock fence in the bottom would achieve the same effect. The cost would be prohibitive for extensive use, with 3 cubic metres of soil being moved for every metre of fence installed.

v) Open corridors between cattle grids – this is a system used in Dutch nature grazing areas so that fenced roads cease to be a barrier to free-roaming stock. The road is generally fenced on both sides; an unfenced stretch of perhaps 50 metres is contained between two cattle grids. The animals can cross the road via this corridor but the traffic is made aware of the presence of animals because of the cattle grids. The Dutch have also built "ecobridges" - wide, grassed over bridges which allow animals to cross roads in safety.

Cost is prohibitive due the requirement for two road specification cattlegrids.

vi) Electronic fencing – designed to restrain dogs, this system consists of a buried perimeter wire which sends a signal to a special collar worn by the animal. Whenever the animal approaches the perimeter, the collar is activated and the animal withdraws. John Bacon (*pers. comm.*) has carried out extensive trials with this equipment but has failed to make it work properly on a scale which would be useful to the Forest.

5.3 Summary

In the short to medium term at least, traffic speed will not decline sufficiently to allow safe open grazing on any Forest roads.

Close herding has potential but is limited by expense. The ratio of stockman:animal is small, especially over a large area and where the grazing stock split into smaller groups; fences are still required to provide night enclosures and to protect stock from the busiest roads.

No significant grazing will be achieved without some fencing.

It is tempting to look no further than conventional stock-fencing and to create grazing enclosures in the same way that a farmer fences grazing pasture. However, there are measures which can mitigate the impact of fencing, both aesthetically and from a public access standpoint, and such measures should be incorporated into fencing schemes wherever possible. The most suitable measures are likely to involve hiding fences in the natural topography and allowing fences to become hidden in appropriate vegetation (gorse).

6. Fencing options for Ashdown Forest

There are two options for fencing the Forest. The first involves, as much as possible, fencing to existing boundaries and reducing internal fencing to roadsides. The second involves fencing off heathland compartments.

6.1 Quasi-perimeter fence

A true perimeter fence would be 162 kilometres in length. There are several problems associated with such a fence (eg the fragmented nature of the Forest, the A22 trunk road, the multitudinous access points) but these can be mitigated by a compromise 'quasi-perimeter' fencing proposal.

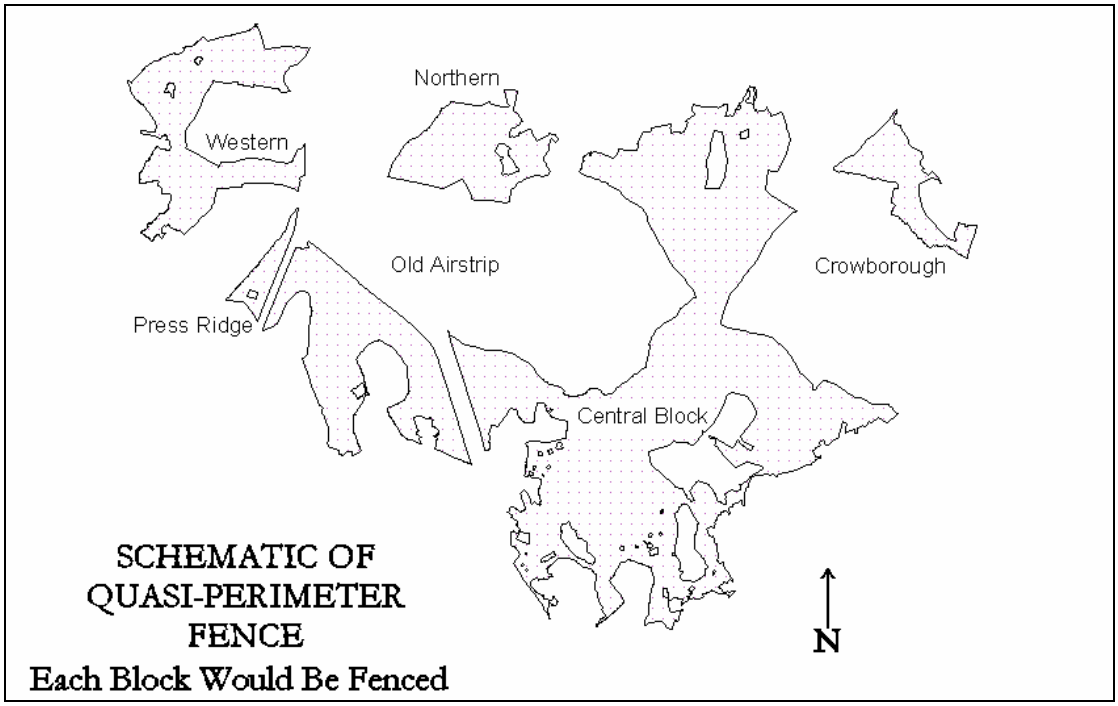

Figure 2. A quasi-perimeter fence.

The "quasi-perimeter" fences (Figure 2 and Table 2) could make sensible compromises:

i) The Forest would be split into six uneven compartments (Table 2).

ii) The A-classified roads would be fenced but all other roads would be open to grazing animals. The scheme would require up to 46 cattle-grids.

iii) The golf courses would be excluded (grazing is unlikely to be very beneficial to the golf course vegetation; opposition to grazing the golf courses will be vociferous; excluding the golf courses significantly reduces the number of cattle grids required).

iv) The woodlands south of Fairwarp would be excluded, as would narrow strips of woodland besides roads.

v) The Vachery woodland would be excluded.

Table 2. Quasi-perimeter fence details.

Compartment name	Perimeter length (km)	Area (ha)
Northern	8.7	171.6
Crowborough	7.6	96.1
Press Ridge	4.1	33.6
Old Airstrip	14.9	286.7
Central*	58.4	1334.0
Western	15.7	270.9
Total	**109.4**	**2192.9**

***** This includes the existing 500 ha block of fenced grazing

6.1.1 Advantages of quasi-perimeter fencing

The majority of the Forest (2193 out of 2467 ha) would be enclosed and stock would be contained within the six compartments.

The fences would largely coincide with existing boundaries (though the majority of these are not currently stockproof).

Further fragmentation of the Forest would be minimised.

All the Forest would be grazed, including small heathy areas in woodland which would probably not be grazed in the "compartment system" below due to the problems of fencing through woodland. (The ecological effects of grazing successional birch woods are unknown but there are two predictable advantages: grazing the woodland would be a more "natural" system, simulating the grazing of the "wildwood" by wild herbivores; clearing trees to restore heathland glades would be more efficient in the presence of grazing.)

6.1.2 Disadvantages of quasi-perimeter fencing

The total cost, at £4.50 per metre, would be in the region of £0.5 million plus cattle grids.

The fencing of (A-class) roads would lead to conspicuous fences (though this could be mitigated by imaginative fence design).

A perimeter fence would disperse stock to graze all vegetation on the Forest, including woodland types which may not benefit, rather than concentrating on the heathland areas.

All the minor roads would be accessible to grazing animals, with inevitable casualties.

6.2 Selected grazing compartments

Figure 3 shows 28 areas of the Forest for which grazing should be an available option. The map is derived from the Vegetation Survey carried out in 2000 and illustrates those areas of the Forest which were not at that time classified as "Woodland". Unlike the quasi-perimeter fence compartments, none of these compartments cross roads and they only include sufficient woodland to provide shelter and shade to the animals.

The area which requires consideration for additional grazing falls into 28 uneven compartments (Table 3).

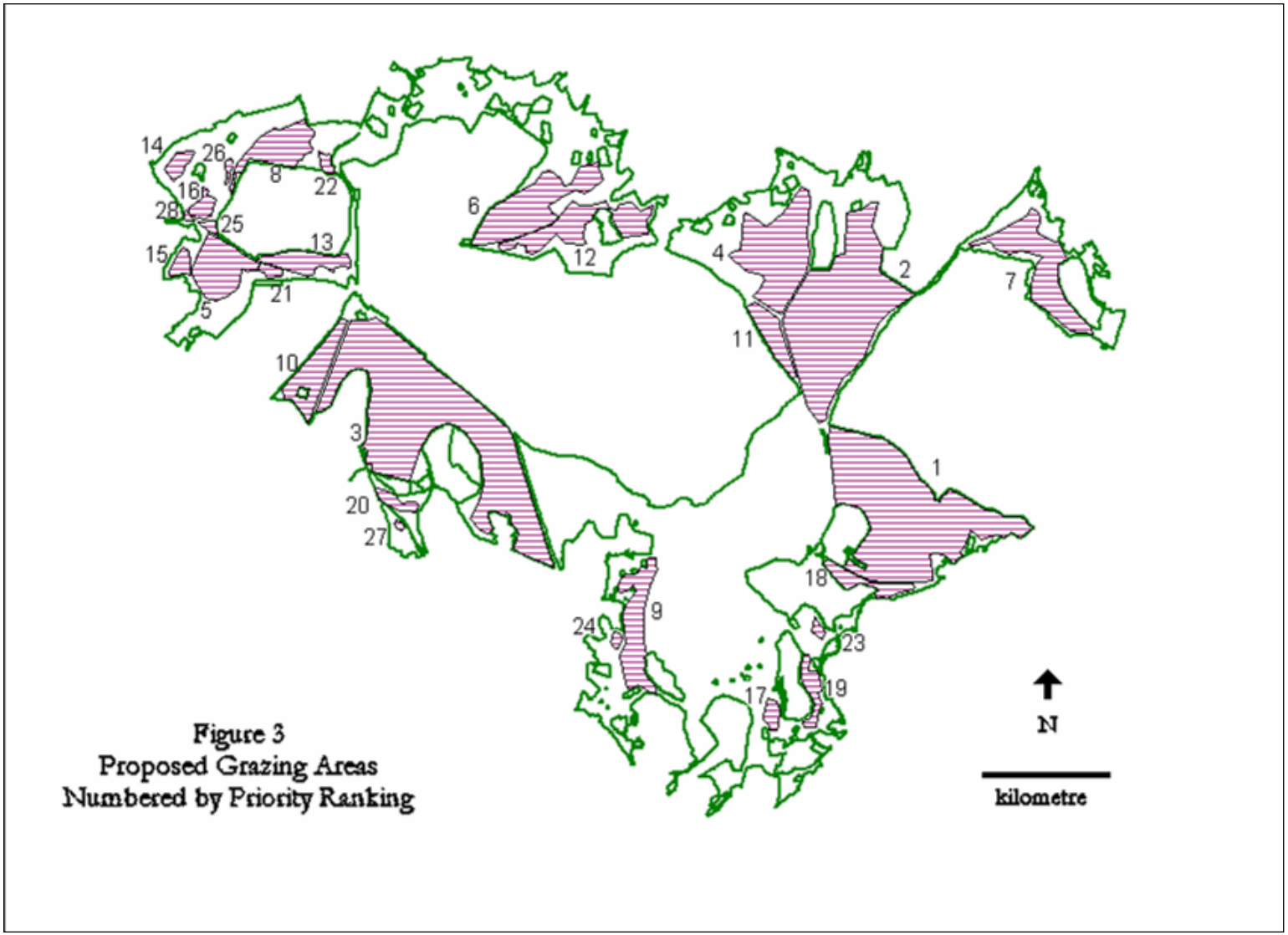

Figure 3
Proposed Grazing Areas
Numbered by Priority Ranking

Table 3. Proposed grazing compartments, numbered in order of priority for introducing grazing. Compartments are described in detail in Appendix 1.

Priority	NAME	AREA (ha)
1	Radio Station	189
2	Wrens Warren Valley	165
3	Vachery – west of A22, south of A275	229
4	Gills Lap Valley	71
5	Cripps Manor	33
6	Broadstone	54
7	Mardens Hill	52
8	Priory Road	29
9	Ardennes – west of Misbourne valley	36
10	Press Ridge	27
11	Tile Lodge	17
12	Ridge	38
13	Hindleap	18
14	Legsheath	6
15	Dallingridge	5
16	Goat Car Park	6
17	Fairwarp	5
18	New Road	12
19	Paynes Hill	10
20	Chelwood Common	6
21	Twyford	3
22	Cherry Orchard	3
23	Campfileds Rough	2
24	Nutley – Rough Ground	2
25	Goat Corner	2
26	Mudbrooks	2
27	Streeters Rough	1
28	Plawhatch	1
	Total	1024

It has been stated elsewhere (Marrable 2003) that grazing should be possible on all the Forest heathland. Should restoration take priority over maintenance? Restoring 6 ha of deteriorating heathland (for example, the management of over-grown mire vegetation at Priority16, which can be best achieved by grazing with cattle or ponies) could take the same effort as maintaining 70 ha of near-favourable heathland at Priority 4. Prioritising here is achieved using a pragmatical scale – where will it be easiest to introduce grazing, and which areas will return the best cost-benefit?

The biggest compartments are the most cost-effective to fence, especially where existing boundaries are utilised. Also, the larger areas are easier to graze – there are fewer worries about stocking rates (it is easy to over-graze a small site), visitors can more easily avoid the animals if they choose to, the consequences of a wild-fire are less and the animals are likely to be exposed to a wider choice of food. It is these considerations which have determined the priority of the compartments in Table 3 above.

6.3 Summary

A perimeter fence enclosing the whole Forest is considered and rejected.

A more feasible proposal is the so-called quasi-perimeter fence, producing 6 unequal compartments formed mainly by fencing the busiest roads and reinforcing fences on existing boundaries. This proposal minimises further fragmentation of the Forest but includes grazing on the quiet(?) roadsides. This should perhaps be a future goal, which will be achieved only when the roads have been effectively 'calmed'.

Close-herding could have a role within a quasi-perimeter fencing scheme, as could temporary electric fencing, but the manpower cost is high and the number of animals involved too small to solve the Forest grazing problem.

Fencing selected compartments to address specific aspects of heathland management is the preferred option. To achieve the best cost-benefit, the largest areas should be fenced first.

Any extensive fencing scheme will require permission from the Secretary of State and this can take a long time. The Conservators have the opportunity to fence up to 100 acres immediately and this should be used to create a new enclosure in the Radio Station compartment, using the Kings Standing Police Training Area fence as one boundary.

7. Animals

7.1 Sources of animals

As discussed elsewhere, the grazing pressure (utilisation of vegetation) on the 500 ha of enclosed Forest reached something close to a maximum in 2003. The long, hot summer reduced plant growth and the stock were forced into areas where they do not normally graze. Whereas this is perceived to be a desirable effect occasionally, several years of the same weather would in effect reduce the carrying capacity of the existing enclosure. Some of the existing stock could be usefully moved onto other parts of the Forest, changing the stocking rate of the old enclosure and introducing stock to a new area of grazing.

If the currently ungrazed Forest heathlands were to be grazed in a similar way to the existing grazing area, an additional 500 livestock units (l.u.) (1 cow or 5 sheep = 1 l.u.) would be required *ie* 1000 ha to be grazed at 1 l.u./ 2ha / yr (Appendix 1). However, if the new grazing is to vary from no regular grazing to heavy grazing, with durations from short period summer grazing to over-winter grazing, the stock requirement could drop to something less than a half. This means that eventually the Conservators must find the equivalent of some 200 additional livestock units *per annum*.

Sources of stock are discussed below.

7.1.1 Transhumance

It is tempting to see transhumance (the droving of animals from summer to winter grazing grounds and *vice versa*) as reinstatement of some ancient activity. However, Harris (2002) demonstrates that the Forest was not settled in a way which suggests that extensive transhumance occurred.

Regardless of the history, modern transhumance can supply summer grazing animals for the Forest – whether the animals "belong" to the Forest and are out-wintered or they "belong" elsewhere and are summer grazed on the Forest. The first modern transhumance occurred in December 2003 when a Forest Commoner moved 20 Welsh Black cattle to National Trust land near Devil's Dyke, grazing through the winter in an attempt to reduce tor grass (*Brachypodium pinnatum*) on chalk downland.

According to Caroline FitzGerald (Weald Heathland Initiative, Project Officer. *pers comm*.), there are some numbers of animals whose owners are looking for summer grazing. She cites, for example, 27 (currently, though the number is set to rise) Exmoor ponies kept at Seven Sisters Country Park for winter grazing of downland (see 2.2 above); also, there is a farmer in west Kent who has several Highland cattle for which he hopes to find summer grazing.

While transhumance is in many ways an ideal solution, not enough animals are available to stock the whole of the ungrazed heathland on Ashdown Forest.

7.1.2 Commoners

Though only two Commoners currently graze animals on the Forest, several more have expressed an interest in doing so. With the financial support that the Forest receives from conservation grants, it may be possible to offer financial incentives for more of the Commoners to take up their Right of pasturage.

A Commoners' "grazing co-operative" could be formed, whereby a commercially viable flock would be made up by pooling individual Rights. This would allow those Commoners whose entitlement consists of grazing one, or a few, sheep to get involved with the grazing of the Forest. Again, the numbers involved are unlikely to provide enough grazing on the Forest.

7.1.3 Contract grazing

Sutton Park in Birmingham manage to charge local farmers a licence fee to keep stock on the Park (See Box 4). This contrasts with the Ashdown situation where Commoners are paid to graze. Presumably, the attraction to these farmers is that they can depasture their stock into an enclosed area, leaving their in-bye land for winter fodder or cereal production. This could be a good option for stock-holders close to Ashdown Forest, particularly if the 30 month beef rule is relaxed and there is less rush to finish animals for market.

Box 4 Sutton Park, Birmingham

John Porter, *pers. comm*.

Sutton Park is an enclosed area of 1000 ha of grassy heath in urban surroundings. It was granted as a public space by Henry VIII in 1528.

The area is SSSI and NNR; much of the area is Scheduled Monument. There is close liaison with English Nature and English Heritage.

There are some 2 million visits per year.

The management plan proposes that the area should be grazed by 250 cattle: last year (2003) the grazing consisted of 164 cattle on c. 800 ha plus 20 Exmoor ponies on c. 200 ha.

The cattle are owned by, and remain the responsibility of, "contract graziers" who pay a licence of £10 per year.

The cattle are grazed through the summer only, approximately Easter to November.

In an average year, the cattle can be fattened on the grazing available in the Park; in 2003, due to the prolonged dry weather, the grazing was of lower quality.

The Exmoor ponies are of "wild stock" (not domesticated) and do not interfere with the activities of the visitors. Only mares, plus one gelding, are kept.

The ponies remain on the Park all winter and are not fed.

Monitoring of the effects of grazing is *ad hoc*, though a more systematic approach is anticipated.

7.1.4 Buy and sell

This option is to purchase steers in the spring and sell them in the autumn. In 2003, there was a reduction in value between spring and autumn steer sales of 5p/Kg live-weight (Nix 2004). Assuming the animals are around 400 kilos (weight gain during their time on the Forest will be unpredictable, dependant on breed, stocking rate, weather and quality of grazing), the worst case would be a cost per animal of £20. Additional costs would be staff time, transport to and from markets, market costs and vet fees. This seems to be a cost effective means of obtaining grazing animals, especially as it gives great flexibility in animal numbers – the number bought matches the grazing requirement, without depending on third party graziers.

The Pembrokeshire Living Heathland project (Box 5) has developed contacts with members of the Welsh Black Cattle Society to buy and sell pedigree animals at a premium.

BOX 5. Pembrokeshire Living Heathland

Andrew Tuddenham, *pers. comm*.

Since the early 1990s, the project has run a herd of 10 – 15 Welsh Black steers.
They are aged from 7 – 18 months and are bought and sold through members of the Welsh Black Breed Society.

The animals are kept for either one summer and one winter, or one summer and two winters.

They are used for "restoration" grazing, alongside Welsh Mountain ponies, at rates of up to one livestock unit per 1.5 ha.

The animals are enclosed on the heath; some temporary electric fences are used and these have been successful at restraining the stock.

The animals are kept out all year but are moved off very wet heath in the winter. *Molinia* in winter offers no feed value.

The animals put on weight while they are out on the heath and also develop good conformation. They are sold in late summer, allowing some fattening time on improved pasture prior to slaughter in October / November.

In 2003, the animals were bought for £420 and sold for £500; if staff costs are ignored, there is a modest profit to be had from this scheme.

Monitoring is restricted to Common Standards vegetation condition monitoring.

7.1.5 Feral stock

The Dutch are experimenting with the concept of "nature grazing", introducing animals to areas and then managing them by a process of minimum intervention (Helmer 2002). The process can only mimic the natural world to a degree: the areas are too small to allow normal migration, there are no large predators and humane issues demand interference to prevent suffering.

The advantages are that the animals are out of the human food chain and so there are no market targets, the staff costs are reduced due to minimum handling (over-looking is still essential), and the animals learn about the seasonal availability of feed across the site. The main disadvantages are that when, eventually, the animals do have to be handled, they are unused to it and can be difficult to manage. Also, feeding may be necessary in hard winters.

There may be a public perception problem: stock out on the open heath in winter may look forlorn, even if they are sufficiently well-fed and perfectly capable of thriving under those conditions.

7.1.6 Conservators as stockholders

The adoption of most of the above options would require the Conservators to become to some degree stockholders in their own right. This is not a light undertaking and the necessary expertise is not currently available in-house. New personnel or training of existing personnel would be essential to cope not only with the husbandry of the animals but also with the paperwork of grant applications, movement orders and so on.

7.2 Species of animal

Table 4 shows that each of the domestic species has advantages and disadvantages. If possible, they should all feature in the planning of new grazing regimes because they all offer different effects on vegetation.

Table 4. Characteristics of different grazing animals (Putnam 1986; Lake and others 2001)

	Sheep	**Cattle**	**Ponies**	**Goats**
Prefer grassy habitats	++	++	++	+
Prefer wet grassy habitats, especially *Molinia*	-	++	++	
Graze, rather than browse	+	+	+	-
Graze selectively	++	-	+	
Graze to short turf	++	-	+	
Variable diet	++	-	+	
Eat dead material (*Molinia* straw)	-	+	-	
Eat gorse and some scrub	+	++	++	++
Eat coppice growth and kill stumps	+	++		
Selectively graze flowers and current year's *Calluna* growth	++	-	-	
High volume of fodder consumed, due to relative inefficiency of digestion	-	-	++	
Cause trampling (kills bracken, but also kills heather)	-	++	++	
Graze long, coarse vegetation	-	++	+	
Easily handled (eg with dogs)	++	++	-	-
Prone to disease	++	-	-	
Worried by dogs	++	-	-	+
Prone to traffic accidents	++	-	+	
Disturbed by visitors	++	-	+	
Learn disruptive behaviour (to visitors)	-	-	++	
Interfere with equestrians	-	-	++	
Range freely, covering a lot of ground	-	++	++	
Herds in small groups	+	++	++	
Groups conjoin at water sources	-	++	++	
Most frequently grazed animals on heathland	-	+	-	-
Hardy under Forest winter conditions (depending on breed)	+	+	++	++

Key: ++ strong agreement with characteristic
+ agreement with characteristic
- disagreement with characteristic
empty box denotes lack of information

There is no account here of exotic grazing animals. A determination of their value to a grazing scheme should wait until the animals become available.

7.3 Breeds of animals (Tolhurst & Oates 2001)

There are many breeds of domestic stock; some are more suitable for grazing heathlands than others. This section gives an account of some these breeds, concentrating on examples of those that have a history of conservation-style grazing.

Cattle

i) Upland beef (eg Welsh black)
Hardy, thrifty breeds; small-medium size; may have handling problems; slow growing and late maturing; produce good beef.

ii) Dual purpose (eg Dexter, Shetland)
Can be hardy and thrifty; some are small; good handling characteristics; can be finished in 30 months on conservation grazing; produce good beef.

Sheep

i) Primitive sheep (eg Hebridean)
Very hardy; small size; thrive on poor vegetation; commercially poor; good browsers; can lamb out and unaided; can have handling problems.

ii) Hill sheep (eg Welsh mountain)
Very hardy; small size; thrive on poor vegetation; first in the chain of "stratification" (hill ewes crossed with lowland breeds to give lambs fattened on improved lowland pasture), therefore commercially valuable; good browsers; can lamb out and unaided.

iii) Upland sheep (eg Beulah)
Hardy; graze poor vegetation but not as successfully as Hill/Primitive sheep; less likely to browse; twins should lamb indoors, singles will be fine outdoors.

Ponies

i) Native ponies in free ranging environment (eg Exmoor)
Hardy, can graze all year if allowed to range; can cause problems with equestrians and picnickers; can be difficult to handle; some commercial value, especially pure-bred dams.

i) Non – native primitive and hardy breeds (eg Konik)
Hardy, can graze all year if allowed to range; can cause problems with equestrians.

Goats

i) Feral
Difficult to manage if not handled; good on difficult terrain; suited to free-ranging existence; available; hard to contain.

ii) Dwarf
Easier to manage; do well in conservation situations; small and easy to contain.

7.4 Age and sex

The age and sex of grazing stock can have important implications for the choice of stock to graze the Forest.

Stallions should not be used due to the increased likelihood of their interfering with ridden horses. Bulls, however, represent less of a threat to Forest users than a cow and calf and should be allowed to graze the Forest. Entire rams will not be used, by traditional agreement among Commoners, for husbandry reasons.

Old sheep would not cope well with the coarse grazing offered on the Forest heathland but are known to be good at directing younger animals to the best grazing. Some older animals should be kept.

7.5 Numbers of animals

"There is growing evidence that in fact a certain healthy dose of fluctuation in large herbivore population is crucial in the long run for the conservation of species diversity and a more developed landscape pattern" (van Brouwershaven and de Smet 2002).

The current stocking rate on the Forest is governed by the economic benefit to the Commoners – previous experience and observation of stock condition determine the number of animals present. The average stocking rate has been 1 l.u. / 2ha.

In the absence of detailed information on the effects of grazing on Forest animals, the stocking rate should be aimed at achieving the habitat objectives outlined above (3.1). As there is a degree of flexibility in these objectives, two principles should determine the intensity of grazing in any new area: i) the new grazing should be *different* from the current grazing regime which exists in the fenced enclosure. As the existing grazing pressure is probably somewhere near to a maximum (unless detailed monitoring should prove otherwise), the new grazing should begin at a much lower density of animals per area. ii) the duration of the new grazing should be different, for example, heavy pressure for short periods ("pulsed grazing") or light pressure for long periods (over-winter?).

Grazing effect can be loosely split into "restoration" and "maintenance". The former suggests that the vegetation is rank and scrubby and that a large volume of material should be processed – a relatively high grazing pressure, using cattle or ponies, possibly over a short period of time, and probably including some mechanical treatment such as burning or felling. "Maintenance" implies that the existing vegetation is somewhat "favourable" and requires a lighter hand: lower grazing pressure, with the addition of some mowing (Symes and Day 2003).

7.6 Summary

- Animals can be acquired from a number of sources. Initially, it would be possible to reduce the stocking rate of the current 500 ha enclosure to graze new areas; animals can be imported onto the Forest from winter grazing schemes; any new scheme should not be limited to summer-only grazing, which would allow a feral herd to be kept. In the longer term, a Commoners' Co-operative could be tried, perhaps alongside a local marketing initiative.

- All available domestic species should be used, at least in a trial capacity. Sheep have a benefit and should still be used, despite their husbandry short-comings. The degree to which the different grazing is important to heathland management is unknown but the very short turf associated with Ashdown Forest rides (sheep) and New Forest lawns (pony grazing) is beneficial to many species. Cattle should be the mainstay of new grazing enterprises but serious consideration should be given to ponies. Goats are somewhat unknown but have been used successfully on scrubby sites (R. McGibbon, Surrey Heathland Project, *pers. comm.*) and, if they were available, could have a valuable role in restoration-type grazing.
- As far as breeds are concerned, anything with an upland background is likely to thrive. Highlands are always popular with the public and, for example, Belted Galloways are more conspicuous. Small animals, such as Dexters, would be more manageable.

  The breeds should have a sensible balance between hardiness and productivity (i.e. commercial value), as well as being biddable and not upset by the other activities which occur on the Forest. Bulls should not be excluded from the Forest unless husbandry requires it. Stallions and rams should not be allowed on the Forest. Despite possible health problems, older animals will be a benefit.
- On the basis of the existing grazing, around 200 additional livestock units would be needed to graze all the currently unenclosed heathland at a lower stocking rate than currently employed. The final figure will depend on the management objectives of individual compartments, as well as the type of vegetation being grazed and the growth season.
- Animals of the appropriate type are available in the short term at no great expense to the Conservators. Any increase in numbers of grazing animals can only be considered in the light of the Conservators' ability to dedicate staff time and resources to their husbandry.

8. The visitor/animal interface

Although this paper is not tasked with addressing the public relations issues associated with introducing more grazing or fencing on the Forest, it is useful to include some evaluation of the Health and Safety aspects of grazing public access land. This is extended to include a short section on the welfare of the animals, particularly in respect to the preconceptions of the public.

8.1 Public welfare

"Visitors are not at undue risk in areas populated by large grazing animals" (Henkens and Maasland 2002).

These authors make the following points, based on 30 million visits by members of the public to 140 Dutch "nature grazing" reserves with free grazing animals:

- ten incidents occurred requiring medical intervention (GP or hospital visit);
- there were a "few dozen" sprains or bruises caused by bites from horses or head-butting by cattle;

- the larger the reserve area, the lower the number of incidents per unit area;
- ponies are responsible for most injuries;
- there is a high incidence where animals are stroked and fed; this usually applies to ponies;
- there are no known cases where stock turned on visitors in an aggressive way (begging for food, bulls defending cows and cows defending calves are not seen as aggressive behaviour).

On the basis of these observations, the same authors have formulated a Risk Assessment:

- careless actions by visitors are the greatest risk – clear information is required on appropriate behaviour (this also applies to site managers, along with proper training);
- an accepted code of conduct should be publicised;
- visitors should not be afraid of the animals nor over-familiar, but treat them in the same way as other countryside hazards, eg rough ground, deep water;
- there should be an action plan for serious incidents (access for ambulances, nearest hospital, ability to control dangerous animals);
- incident recording should be rigorous and the information shared among other graziers;
- continued research into animal and visitor behaviour should be carried out, leading to recommendations to avoid incidents, eg the need for legislating against feeding or stroking grazing animals.

In addition to the above, specific recommendations can be drawn up for the different species (Tolhurst & Oates 2001).

8.1.1 Cattle

- Cattle are unlikely to be fed by humans therefore do not develop the dangerous behaviour associated with equines.
- Dogs can cause cattle to become aggressive, especially when there are calves present.
- Cows known to be aggressive, whether or not accompanied by calves, should not be turned out onto access sites.
- Cows with calves under twelve weeks should not be turned out (older calves will be less stressed and the dams will be calmer about them). (This is contrary to current Forest practice, where much younger calves are depastured.)
- Dairy bulls may not be grazed on public access sites.
- The keeper must ensure that no dangerous animals are kept on public access sites.
- Bulls on public sites must be accompanied by cows/heifers; it is advisable to warn the public if a bull is present.
- Young store cattle can be alarmingly boisterous but rarely aggressive.
- Polled cattle are less threatening, though most incidents are due to butting rather than goring.

8.1.2 Ponies (and horses)

- May be aggressive towards dogs and pursue them.
- May react aggressively to unknown horses, which could affect horse-riders.
- Are frequently fed by visitors, in which case they soon learn to scrounge; this can lead to biting and kicking incidents.

8.1.3 Sheep

- Rams can be aggressive, particularly in the breeding season or when old.
- Some sheep breeds stand up to dogs but most panic (for good reason!).
- Sheep are most vulnerable to disease and can exhibit easily recognised signs of distress, eg fly strike, foot-rot.

8.2 8.2 Animal welfare (Tolhurst 2001)

The grazing animals on Ashdown Forest fall somewhere between intensively farmed livestock\pets and wild animals; they are "semi-domestic" stock. There has to be an appropriate ethical policy towards these animals: specifically, to unconditionally help distressed animals. However, there are two provisos: first, the sheep have low economic value and will not justify expensive veterinary care; second, the uninformed perception of distress can be some way from the true state, eg a thin animal may be healthier than a fat one.

Enforcement of animal health legislation (including welfare during movement, identification etc.) is the responsibility of County Council Trading Standards. There are several pieces of relevant legislation but the most important is the Welfare of Farmed Animals (England) Regulations 2000. Feral stock become the responsibility of the owner of the land where they are found, as do unmarked and unclaimed domestic animals. It is not just the owner of the stock who takes responsibility for the welfare of livestock but also the "keeper"; this is relevant when stock are being grazed "away", eg conservation grazing on another reserve.

The Five Freedoms principle (Webster 2001) underpins the welfare requirements of all domestic animals. It states that domestic animals should experience freedom:

- from hunger and thirst;
- from discomfort;
- from pain, injury or disease;
- to express normal behaviour;
- from fear and distress.

There is no statutory requirement for routine inspection of extensively grazed domestic animals; over the hundreds of hectares of grazing land on the Forest which includes woodland and deep valleys, it would be impossible to check all the stock regularly. However, attempts should be made to ensure the well-being of all animals at least weekly. Where livestock are exposed to intense public scrutiny, failure to react rapidly to *perceived* or real distress in animals cannot be acceptable.

The use of (trained) volunteers as “lookers”, checking on extensively grazed livestock on a regular basis, can reduce prolonged suffering and prevent distress to, and complaints, from visitors.

Avermectin pesticides

There are concerns about the effects of systemic pesticides used to treat domestic stock against endo- and ecto- parasites. The main problem comes from Ivermectin (active ingredient avermectin), frequently administered as a “pour on” or as a bolus, giving a slow release over the period of the summer. The chemical is known to adversely affect coprophagous invertebrates, which could negate the benefits to biodiversity that the presence of dung should bring. The known high toxicity to fish and crustaceans is not likely to be an issue on Ashdown Forest.

No other single pesticide offers the protection promised by avermectin, though a combination of other chemicals (benzimidazoles plus salicylanilides/substituted phenols, for example) would appear to give good protection.

This is still an unresolved issue on the Forest.

Zoonosis

There is a small risk of spread of disease between grazing animals and man, eg *E. coli* and Lyme’s disease. However, there is no reason to believe that the presence of domestic animals increases the risk compared with land where only wild animals are grazing. (The only case of Lyme’s disease known to Forest staff occurred on land with no cattle or sheep.)

8.3 Summary

It is clear from the above that increased public awareness will address many of the issues associated with grazing stock in public access areas. English Nature is already funding the introduction of interpretation panels into five car-parks inside the grazing area and this process should continue as the grazing is extended.

Animals that are used for grazing must be trustworthy in the face of provocation from the public and those that show any aggressive temperament towards humans must be removed promptly. It may be necessary to distinguish between aggressive behaviour and defensive response to disturbance by dogs.

The highest standards of animal welfare must be maintained, with a rapid response procedure to deal with distressed animals. It will be necessary to distinguish between the public perception of a distressed animal and one that is really distressed.

9. Recommendations

The Vision provides a goal towards which the Conservators can work.

A Vision

In 20 years, Ashdown Forest should have grazing on all its heathland areas.

Different species of domestic stock will graze different parts of the Forest at varying stocking densities and for varying periods, creating a complete range of appropriate wildlife habitats.

The roads will be neither a barrier nor a threat to grazing animals and the open landscape will not be marred by intrusive roadside or internal fences.

Visitors to the Forest will find a variety of open and wooded landscapes, with access unimpaired plus the additional attraction of domestic grazing animals.

Routine, extensive and robust monitoring will measure the results of grazing against management objectives and ensure that the grazing is creating the ideal conditions to fulfil these objectives.

The livestock enterprises will be profitable, being run by commercial organisations representing the Commoners, who will each take a share of the profits.

The produce will be marketed locally, and command a premium for the sustainable and humane way in which it is husbanded.

The Brief for this report states that the conclusion will "Recommend a course of action for introducing grazing". However, there are decisions which must be made at a fundamental level regarding the character of the Forest: in particular, is it acceptable to fence the common? The Board of Conservators must make this decision, giving due weight to all the factors outlined in this report, plus the results of any public consultation exercise. In this light, it seems appropriate to come up with two recommendations, one based on extensive fencing and the other based on reduced fencing. Whilst these choices are being made, new grazing can be implemented immediately.

9.1 Grazing using the Act (a stop-gap solution)

Using the powers granted under the 1974 Ashdown Forest Act (Section 17, 2) the Conservators should, as soon as possible, erect a 100 acre enclosure in the Radio Station compartment valley, using the Kings Standing training area fence as one boundary. Grazing animals could be provided by diverting a dozen cattle from the existing enclosure and, for example, half a dozen ponies from the South Downs.

In the longer term, once wider-ranging schemes are in place, the 100 acre option should be used to enclose smaller heathland blocks which do not justify permanent fencing and/or to create night enclosures for close herded animals.

9.2 The fencing option

This section describes the way that new grazing can be introduced using fenced enclosures, over and above the 100 acre block described, avoiding grazing on roadsides.

1. A successful application to fence the Forest will be at least partly dependant on an extensive public information campaign, convincing Forest users of the value of grazing and the need for fencing. This exercise should begin as soon as possible.
2. Submit to the Secretary of State a complete scheme (Fig. 3) covering all the larger areas, for permission to erect fences and gates on Ashdown Forest. It is better to apply for a complete scheme, rather than having to apply several times. There is no restriction on fencing the existing boundaries, so these need not be included on the application (indeed, there is an obligation on Forest neighbours to maintain these boundaries i.e. to "fence against the common").
3. If permission is granted, fence the largest areas first. Fences should be sensitively designed and positioned to minimise their visual and access impact.
4. Fence the busiest roads, providing cattle-grids, stiles and gates as necessary, to separate the stock from the traffic. 5. Aim for "maintenance" level grazing pressure of around one livestock unit per 2 ha.
5. Stock should initially come from i) "transhumance", ii) reduced grazing pressure on the existing enclosure, iii) stock retained for winter grazing.
6. The smaller compartments (say priority 12 to 28) described below (Appendix 4) need not be permanently fenced because they can be covered by the 1974 Act allowance to enclose 100 acres.

The four highest priority compartments (see Table 3) would give enclosures totalling over 650 ha. The fences for these areas are described in more detail (see Figs. 4 to 7).

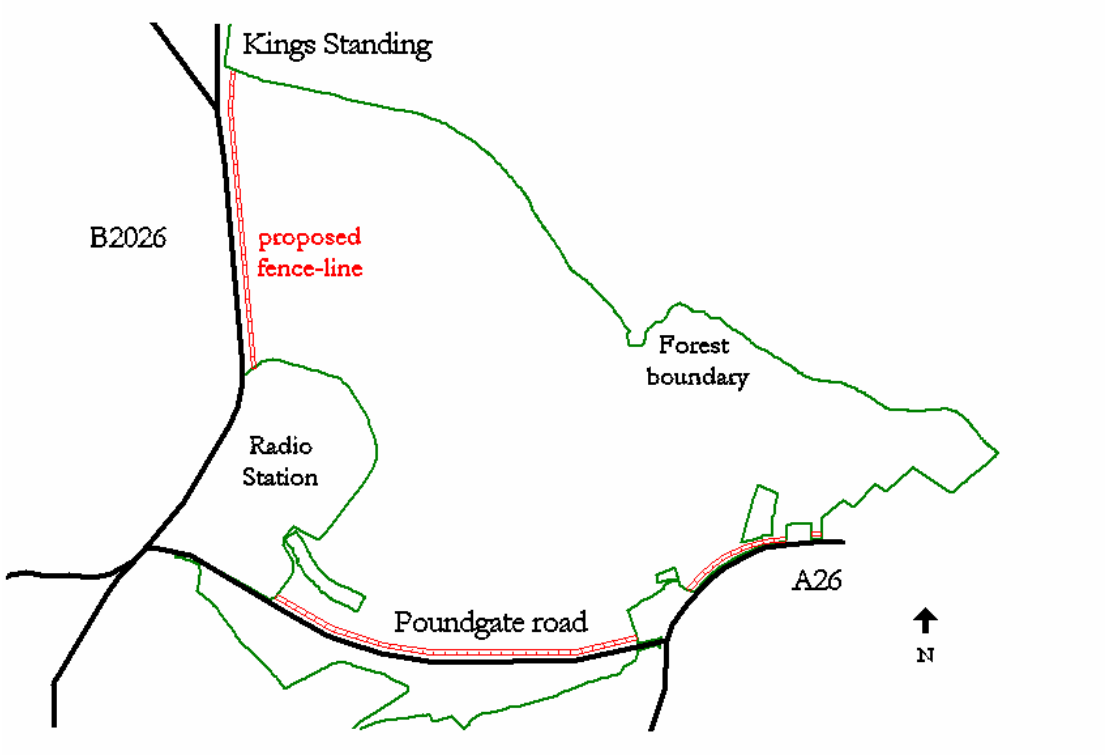

Figure 4. Compartment Priority 1. Kings Standing

Fence B2026 from Radio Station fence to King Standing Farm fence; fence Poundgate Road from Radio Station fence to A26; fence gaps along A26 (total 2400 metres). Remedial stock-proofing will be required on the northern boundary. Six cattle-grids required, two on car-park entrances, the remainder on tracks to properties. Assuming conventional stock fencing, costed at £4.50/m to include gates/stiles at approx.200m intervals, cattle-grids at £2000 each and that the Conservators will have to bear the cost of remedial fencing on boundaries, this scheme would cost up to £28,000.

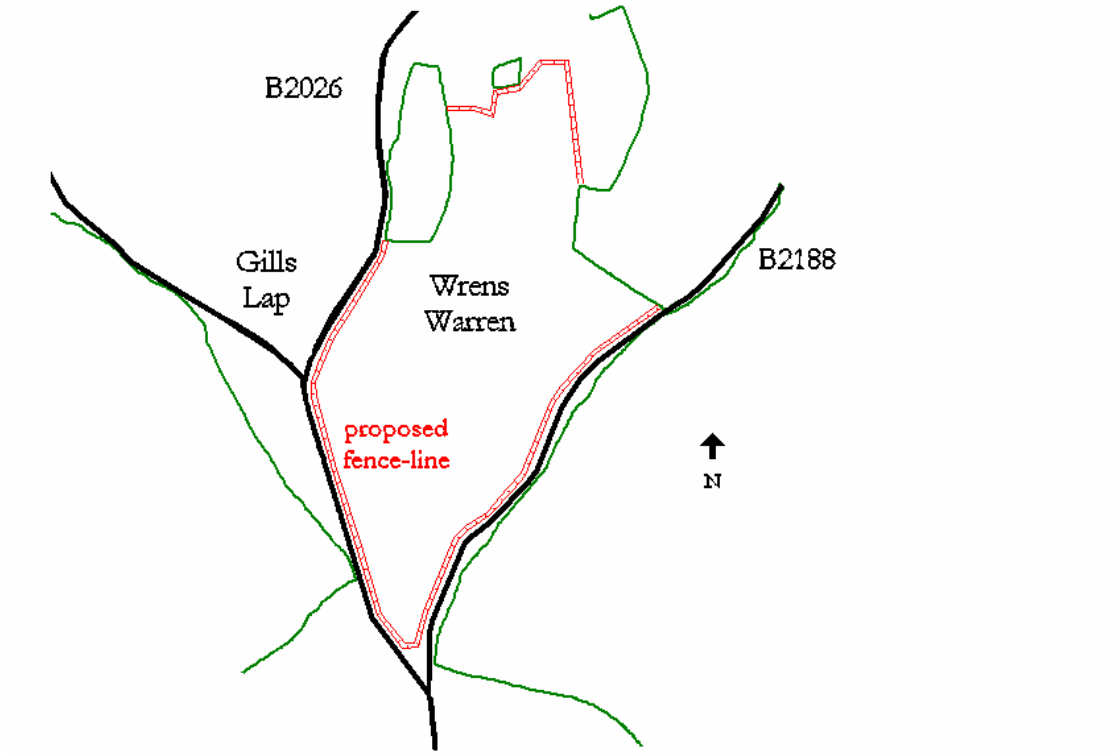

Figure 5. Compartment Priority 2. Wrens Warren Valley

Fence from the south-west corner of Wrens Warren along the eastern side of the B2026, behind Pines car-park and north up the western side of the B2188 to the Forest boundary at Forest Holme. Fence from the corner of the exchange land at 500 Acre across the open heath to Lone Oak Hall and then follow the horse-ride west to the Wrens Warren boundary (total 5000 m). (One cattle-grid required at Black Hill car park entrance.) Fences on the Wrens Warren boundary will need remedial work to achieve stock-proofing. Cost, same assumptions as above would be over £30,000.

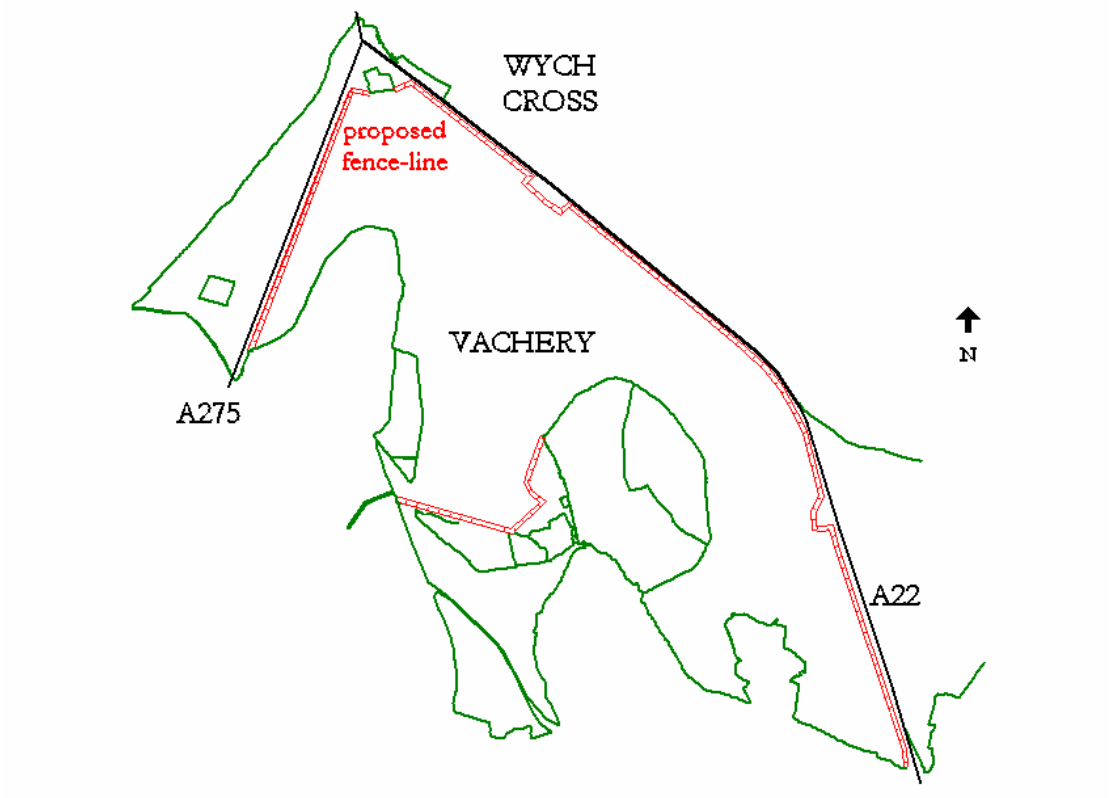

Figure 6. Compartment Priority 3. Vachery

Fence the western side of the A22 from Millbrook Farm to Wych Cross. Fence behind the Wych Cross reservoir to the A275 and along the eastern edge of that road to Chelwood Gate. Fence the northern edge of Braberry Hatch between the Isle of Thorns and the Vachery (total 6000 metres). Remedial stock-proofing will be required on southern boundary, particularly around the Forest-owned section of the Vachery. (Three cattle-grids required, two on tracks and one on Trees car-park entrance.)

Cost, same assumptions as above, would be up to £57,000.

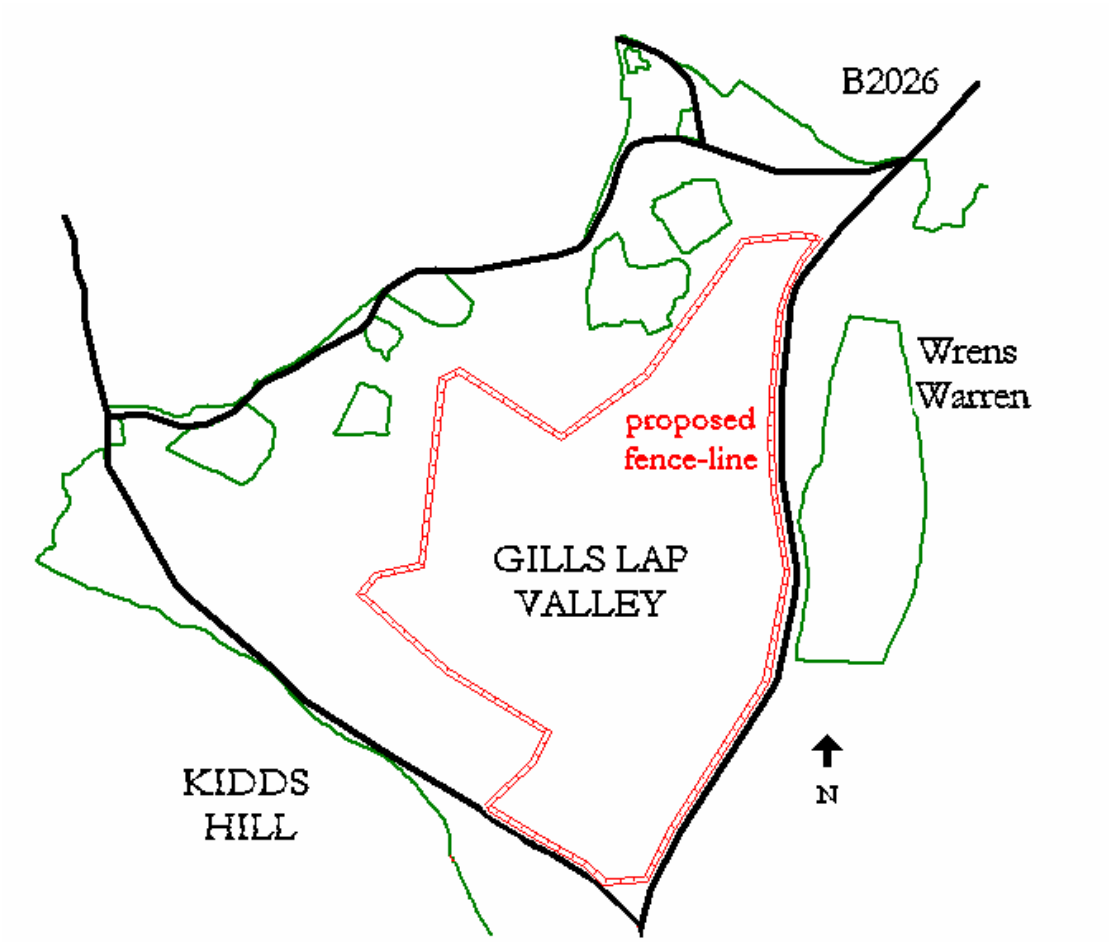

Figure 7. Compartment Priority 4. Gills Lap Valley

Fence the northern section of Kidds Hill, behind Gills Lap car-parks and along the western edge of the B2026 to north of Wrens Warren car-park. Build a fence crossing the heath (to avoid enclosure of several domestic properties and high woodland) passing behind Jumpers Town, Spring Farm and The Rough, and joining the original fence at Kidds Hill (total 4300 metres). Four cattle-grids required, all on car-park entrances.
Cost, same assumptions as above, would be up to £27,000.

9.3 The reduced fencing option

Should extensive fencing be rejected, an alternative to the Fencing Option would be to:

1. Fence the major roads only, as a "safety net". Fences should be sensitively designed and positioned to minimise their impact.
2. Stock should initially come from i) "transhumance", ii) reduced grazing pressure on the existing enclosure, iii) stock retained for winter grazing.
3. Close-herd the stock, keeping them to the areas which require grazing and away from roads.
4. Return the stock to a sizeable temporary enclosure at night.

This option can be achieved in the following way :

1. Submit an application to the Secretary of State to fence off the major roads (A22, A26, A275).
2. Ensure that relevant boundary fences are stock-proof i.e. those fences around the proposed grazing area
3. Employ a stockman. (Close cooperation with existing Commoner graziers could be a source of "on-the-job" training)
4. Purchase enough electric fencing to create sizable temporary enclosures (10 ha would cost in the region of £2,500).
5. Acquire stock as suggested above.
6. Close-herd the grazing stock, keeping them away from roads.
7. Return the animals to their enclosure at night. Move the enclosure to fresh ground as required.

10. Funding

10.1 Current funding sources

All the above proposals cost considerable sums of money. However, every year the Conservators receive around £90,000 from DEFRA, the Weald Heathland Initiative and English Nature, in order to manage the 1500 ha of Forest heathland. Heathland conservation on Ashdown Forest is more cost-effective (and ecologically superior) where grazing is available than where there are only mechanical means and initial investment in grazing infrastructure is eventually re-paid by reduced costs. The actual cost-benefit is hard to quantify but manifests itself as i) reduced direct-labour and contractor costs for scrub management, ii) reduced tractor time (at £22/hour) committed to mowing fire-breaks, road verges and bracken.

The Haskins rural policy review could have wide-reaching effects on how the funding of countryside schemes will be delivered in the future. Currently, it seems most appropriate that DEFRA, via its Countryside Stewardship Schemes (CSS) and its Environmental Stewardship successor, will be the source of funding for the capital works of fencing. Ashdown Forest has four CSS at present and it is intended that the remaining parts of the Forest will be swept up into a fifth Scheme. (The Royal Ashdown Golf Club also has an application for CSS to improve the heathland management of that part of the Forest.) Over a period of time, this complicated situation should be rationalised by combining the individual Schemes into one. The intention to fence heathland areas in line with the compartments described above should be built into the new Scheme and DEFRA should be approached to fund fencing within the existing CSS as Amendments.

English Nature have funded some projects outside the current grazing areas (eg in 2003/4 they paid for scrub removal at Poundgate in the east of the Forest) and applications for this sort of funding should continue.

The Weald Heathland Initiative could provide funding until this project finishes in 2006. They should, for example, be approached to pay for the fencing of the suggested 100 acres in Kings Standing valley.

The Conservators will have to plan to provide some of the matched funding for introducing grazing from their own budgets.

10.2 LIFE-Nature

"The specific objective of LIFE-Nature is to contribute to the implementation of Community nature protection legislation: the Birds Directive and the Habitats Directive, and in particular the establishment of the Natura 2000 network for the *in situ* management and conservation of Europe's most remarkable fauna and flora species and habitats." (www.newforestlife.org.uk)

Funding can be 50% of the costs or, in exceptional circumstances, 75%.

As an example, the New Forest has a LIFE-Nature project involving a consortium of ten organisations aimed at securing the Natura 2000 objectives. These include restoring their candidate SAC habitats to favourable conservation status. The total budget for this project is 7.5 million Euros (approx. £5m), with LIFE contributing 3.75 million.

LIFE-Nature could offer a source of funding for the Forest, perhaps as part of some bigger initiative, such as a grazing co-operative and local marketing scheme.

10.3 INTERREG III

INTERREG III is an "EC Community Initiative to promote transnational co-operation on spatial planning by encouraging harmonious and balanced development of the European territory" (www.interregiiib.org.uk). INTERREG is managed by the Office of the Deputy Prime Minister through the International Planning Unit; this unit can also provide some match funding.

Support will be focused on several areas, including "promoting the

environment and good management of cultural heritage and natural resources". All projects must have partners from more than one country (East Sussex County Council has experience of INTERREG partnerships with Departments in northern France) and must demonstrate concrete, visible and innovative results. As far as the Forest is concerned, projects involving environmental benefit, such as traffic management schemes or local produce marketing schemes connected to a grazing co-operative, might attract partnerships from (loosely) similar areas in Europe. Some such projects could link with the kinds of items currently under discussion by the Ashdown Forest Tourism Forum.

11. Previous experience of applications to fence common land for grazing

The importance of presenting a convincing argument in support of an application to fence the Forest cannot be over-stated. The case studies give important clues as to what helps an application to succeed.

11.1 Case studies

11.1.1 Ashdown Forest 1996

(From the Ruling by Inspector C.A. Robbins)

i) The application was to enclose 547 ha of the Forest's 2467 ha in two phases, to allow safe grazing for conservation reasons and to fulfil the Conservators' duty under the 1974 Ashdown Forest Act to protect the Rights of the Commoners.

ii) The site was SSSI, with free access to the public.

iii) Of the 700 or so Forest Commoners, three were currently grazing and 40 were collecting estovers.

iv) Whereas all the other applications described here were made under Section 194 of the Law of Property Act 1925, this application was made under the Ashdown Forest Act 1974, Section 17(2), which requires that the Conservators obtain consent from the Secretary of State to enclose at any time more than 100 acres. The process is the same – application, advertisement, consultation, consideration and possible public enquiry.

v) 16 objections to the proposal were received by the Department of the Environment and 11 letters were received in support.

vi) In giving his consent to the proposal, the Inspector gave consideration to the stipulations in Section 16 of the Ashdown Forest Act, rather than the over-riding consideration under Section 194 of the Law of Property Act that there should be "no loss of benefit to the neighbourhood". (Section 16 of the AF Act states that the Conservators should regulate and manage the Forest "as an amenity and place of resort subject to the existing rights of common,…..and to conserve it as a quiet and natural area of outstanding beauty".)

11.1.2 Odiham Common, Hampshire 2003

(K. Chatters, English Nature, *pers. comm.* and Fieldhouse 2003)

i) The scheme proposed was to permanently fence 116 ha in order to maintain the character of the area by the introduction of free grazing.

ii) English Nature stated that grazing was imperative to bring the SSSI area into "favourable" condition and that other forms of management would not achieve this aim.

iii) Permission had been granted five years previously to temporarily fence part of the common to allow grazing. This was considered to be an experimental area.

iv) The Inspector judged that:

a) the fencing would reduce the accessibility and perceived openness of the common; she pointed out that the "fence would remove the ability to walk onto the common in places other than where the common was crossed by customary paths, and this ability distinguishes the common from other countryside generally";

b) the experimental area had failed to prove a significant benefit to the neighbourhood in terms of nature conservation;

c) cattle-grids would prove to be a noise nuisance to local residents and users of the common;

d) fencing would have an unacceptably harmful impact on the character and appearance of the common, as well as reducing accessibility;

e) permanent fencing was not necessary to provide security for stock;

f) there was no convincing evidence that grazing was the only method of maintaining or improving biodiversity.

v) Permission to fence was refused.

11.1.3 Wisley Common, Surrey 2002

(S.J. Chimbwandira, S.W.T. Countryside Services Ltd, *pers. comm.*)

i) The scheme was to permanently perimeter fence 105 ha; two sides of the site were already fenced.

ii) The area is common land owned by Surrey County Council with no registered commoners.

iii) The fencing would allow grazing; the application claimed that grazing would control scrub establishment, provide habitat to benefit wildlife, enhance the open landscape and enhance access to the area.

iv) Wisley had been grazed within temporary fences for five years.

v) There had been two years of consultation with the local population (as well as other interested groups) prior to the application being made to the Secretary of State. The information dissemination included the circulation of a well-designed leaflet, guided walks and many casual discussions between users of the common and a respected site Ranger.

vi) All the options were considered properly, including shepherding, electric fencing and maintaining the *status quo.*

vii) Permission to fence was granted, despite the Inspector admitting that the fence "would be an eyesore and a physical and psychological barrier to access". The Inspector judged that the scheme would provide sufficient benefit to the neighbourhood.

11.1.4 Chobham Common National Nature Reserve, Surrey 1998

(Chimbwandira 2000)

i) Surrey County Council applied for permission to perimeter fence 150 ha of Chobham Common to facilitate grazing for conservation purposes.

ii) The public have access to the Common by virtue of a Deed of Access of 1936.

iii) Chobham Common is designated as SSSI, NNR, potential SPA and candidate SAC.

iii) Among the benefits that the Inspector recognised were that:

  a) the fence would be hidden;

  b) that grazing would be effective in reversing the decline in heathland;

  c) that the fire risk would be reduced.

iv) The Inspector also stated that:

  a) it was the unfenced and ungated nature of the Common which distinguishes it from the surrounding countryside;

  b) the fence would significantly alter the appearance of the Common and would not protect the existing benefit;

  c) he believed that the open and wild nature of the landscape would be protected using the existing techniques.

v) The Inspector accepted that there was considerable local opposition to the proposal but concluded that "neither the process nor the content of the consultation affected the expediency of granting consent".

vi) However, in turning down the application, the Inspector noted that the reduced accessibility and the negative appearance of the fence would outweigh the additional benefits of grazing to the neighbourhood.

11.1.5 Sutton Common, Suffolk 2002

(Warman 2003)

i) Sutton Parish Council applied for consent to fence 80 ha of Sutton Common.

ii) The area is SSSI.

iii) The area had been grazed using temporary seasonal electric fencing since 1989.

iv) In 1997, this proved to be impractical due to the time and expense of erecting and removing the fence, its maintenance, its vulnerability to theft and its questionable stock-proofness.

v) The Common is edged by a fast and busy road and escaped sheep represented a danger to themselves and to traffic.

vi) Grazing was suspended and subsequently there had been a noticeable increase in birch scrub, pine and rank grasses.

vii) Due to military infrastructure, mechanical methods of management could not be applied to areas of the Common.

viii) This case did not go public enquiry because:

ix) DEFRA judged that the benefit to the neighbourhood was not compromised. The fencing would facilitate the reintroduction of grazing to maintain the important wildlife habitat and bring the SSSI into "favourable" condition.

x) Alternative measures had been considered but the proposal represented the most appropriate, cost-effective and safest solution.

xi) Visual impact would be minimised by use of appropriate materials and careful fence positioning. Gates will allow continued access.

xii) English Nature and the local Ramblers Association supported the proposal and no objections were received.

11.1.6 Stedham Common, West Sussex 1998

(Chimbwandira 2000)

i) Sussex Wildlife Trust applied to fence 35 ha of Stedham Common to facilitate grazing for nature conservation purposes.

ii) The area is common land but has no right of access other than statutory Rights of Way; the Trust encourages open public access.

iii) Stedham Common is designated as a SSSI and is a Local Nature Reserve.

iv) The Inspector's opinion was that there would not be a practical loss of accessibility with the fence and gates and did not accept that the proposal constituted an infringement of liberty.

v) The Inspector stated that there would be some loss of benefit, particularly to horse-riders, due to the need to use gates but there would be no significant loss in the benefit of being able to roam and that stock constituted an attraction, rather than a deterrent.

vi) The Inspector agreed that grazing represented the best option for managing the heath, combined with a range of other techniques – optimum rather than convenient management should be pursued.

vii) Local opposition was strong but those objecting had limited experience of enjoying grazing animals on heathland. If consent were to be given, a lot of effort should be put into involving the local community and the fence should be removed if grazing were not successful.

viii) In giving his consent, the Inspector summarised the case by saying that the need to maintain and enhance the habitat outweighed the loss of benefits.

11.2 What can be learnt from these case studies?

The appointed Inspectors have no *specific* guidance when judging a case. This leads to variation in interpretation of the terms "benefit to the neighbourhood", the major requirement in determining cases made under the Law of Property Act. The Inspector at Chobham stated that "existing" benefit must be protected over and above any "additional" benefit – fencing represents a loss of existing benefit; the effects of grazing on the heath represent an additional benefit. The application was turned down. At Stedham, the Inspector interpreted the rule differently, saying that the loss of existing benefit was out-weighed by the additional benefit

due to grazing. ***Lesson: Prove that a benefit has been achieved and prove that the benefit can be achieved only by grazing.***

The conservation importance of the site being considered appears to be of little significance: Chobham, SSSI, National Nature Reserve, candidate SAC, potential SPA, failed to get permission to fence; Stedham, SSSI and Local Nature Reserve, succeeded in its application to fence. ***Lesson: Do not rely on the statutory designations.***

Precedent is not an over-whelming consideration in the Inspectors' decision process. Many sites are given permission, some fail, but in every case the same issues are debated. English Nature, in consultation with other interested bodies, is attempting to resolve this paradox through a report due for public release at the end of June 2004. (See 8 below) ***Lesson: Campaign for a consistent approach to fencing on common land.***

The Odiham Common ruling suggests that it is not sufficient to demonstrate that grazing has been beneficial on other areas. ***Lesson: Monitoring the (ecological?) impact of fencing and grazing should be undertaken on the Forest. With five years experience of large-scale grazing on the Forest, it is now essential that the Conservators can prove that there is a local (ecological) benefit, particularly in comparison with non-grazing means of managing the heath. Prove unequivocally the local conservation benefit of grazing. In demonstrating a benefit to the neighbourhood, the additional positive aspects of grazing should be demonstrated – sustainability, "natural-ness", tradition and welfare of animals.***

Permanent fencing as a solution for safe grazing should only be proposed after proper consideration has been given to all other options. ***Lesson: Prove that all options have been properly evaluated and that due consideration has been given to reducing the visual impact of fencing.***

In each case, the Inspectors judged that a fence was a barrier to access, physical and psychological, and that there was a negative visual impact. More than one Inspector pointed out that the absence of fencing and the ability to access the common at any point are the characteristics which distinguish the common from the surrounding area. ***Lesson: Design fences that do not impede pedestrian access and that "disappear" in the landscape.***

Though public relations are beyond the scope of this report, it is clear that going into a Public Enquiry with a "formed group" or many local people opposing the proposal will massively jeopardise a successful outcome. The Wisley Common application appears to be a text-book success in this regard. Despite opposition from the Open Spaces Society, local opposition was defused by two years of consultation, discussion with a trusted Ranger on site, leaflets and education. ***Lesson: Disarm local opposition to the fencing scheme prior to any formal application by proving the benefit and build up a strong local forum of support for the re-introduction of grazing.***

The spin-off from the failure of the Odiham application and other failures (eg Chobham) has forced English Nature into making the decision that no new fencing/grazing applications should be supported until the ecological case is unconditionally proven. English Nature has brought together several interested parties to consider a national policy on the management of common land, including fencing applications. The groups include English Nature, Countryside Agency, DEFRA, Open Spaces Society, National Trust. The final report will

constitute a code of practice for planning works on common land rather than a streamlined route to allow fencing where the conservation requirement for grazing is demonstrated.

12. Monitoring

"There are often high expectations of the effects of grazing on plants and animals, but these are rarely worded specifically as to which species should produce these results. This uncertainty is however inherent to a natural process. The collective efforts of scientists have done little to add to our knowledge about grazing effects, ecological and otherwise. It is remarkable that our current knowledge hardly surpasses that of a quarter century ago. It is generally difficult to predict scientifically if grazing will have a positive effect on the whole range of species groups in an area. It is impossible to say whether grazing is better than mowing or felling. Perhaps, species which occur in extensive open, low-nutrient landscapes cannot survive by grazing alone." (van Brouwershaven 2002)

"To date there has been little research on the impacts of grazing on lowland heathlands in the UK, and it is not possible to predict the consequences for all heathland wildlife." (Lake & Underhill-Day 2004)

12.1 Monitoring the existing grazing: towards the ten year review

In 1996, when consent to fence the Forest was granted, the Conservators determined to review the effects of grazing after ten years. It was subsequently decided that an intermediate review should be carried out after five years of grazing and this was the impetus for the English Nature Research Report *Ashdown Forest – A review of grazing* (Marrable 2003). In compiling this review, it was clear that there was a paucity of objective information on the ecological effects of grazing. There is opportunity to assess the direct impact on the vegetation (compared with similar vegetation outside the grazing area) and it is apparent that the "habitat effects" that are associated with grazing described above are being met. Also, many non-ecological aspects can be evaluated or described (cost effectiveness of management operations, landscape issues, cultural issues, for example). **However, the effects on heathland animal species due to the grazing have not been demonstrated on Ashdown Forest.**

From the case studies above, particularly the Odiham Common public enquiry, it is predictable that in any proposal to extend the fencing, the ecological benefits of grazing must be proved unequivocally. This means that the monitoring of a suite of (heathland specialist?) taxa should begin as soon as possible.

"There is an urgent need for more information to guide the use of grazing as a management tool for lowland heathland." (Lake and others 2001). The authors go on to describe five methods of collecting data, ordered by their value in terms of cost effectiveness and scientific rigour.

1. Comparing effects of grazing pressure on replicated plots.

   This would require the creation of fenced plots within the grazing area, manipulation of the number of animals in each plot, followed by an assessment of the effect. While it is true that grazing pressure has varied within regions of the grazing area, it is impossible to quantify the grazing pressure (or 'utilisation of vegetation', which is a

better measure of the "heaviness" of grazing) because the animals are free to wander. Subjectively, it appears that some parts of the enclosure are "over-grazed" (excessive bare ground and trampling) and some parts are "under-grazed" (no observable grazing effects). Though this method, properly replicated and controlled, would provide the highest level of scientific rigour, it is time-consuming and probably unnecessary due to the area of ungrazed Forest adjacent to the grazed enclosure which can act as a control.

2. Establish standardised monitoring of representative groups on comparable areas which are grazed and ungrazed. This is the preferred method for the Forest and is explored further below (12.2).

3. Meta-analysis of existing data from the monitoring of other heathland projects.

   This method assumes that appropriate monitoring is being carried out on other heathland areas; this may not be the case. Also, experience shows that it is important to prove the local effects of grazing. In the broader context, investigating national trends for species populations may help to explain trends within the Forest area.

4. Detailed study of potential impacts of different breeds and extrapolation of these impacts to the area to be grazed.

   Some of this information is available through the Grazing Animals Project.

5. Autecological studies of key heathland species to understand their precise habitat requirements.

   Studying the detailed ecology of Forest species with a view to predicting how they will respond to grazing is generally beyond the scope of Forest work, due to problems of manpower and expertise. However, there have been discussions recently with Butterfly Conservation about planning an MSc project on the autoecology of silver-studded blue butterflies. This approach could be extended to other species if student input could be found.

12.2 Monitoring the proposed grazing areas

Assessment of the effect of grazing is achieved by comparing grazed areas with *similar* ungrazed areas; it currently covers only birds, butterflies, marsh gentians plus the Common Standards vegetation monitoring. A better evaluation of the impact of grazing would be demonstrated by collecting data prior to grazing, followed by repeated data collection at periods after grazing has started.

Importantly, this pre-grazing assessment would also be used to determine the suitability of an area for grazing and the type of grazing which should achieve the desired ecological objectives (Offer and others 2003).

12.3 What to monitor

Other than birds, butterflies and flowering plants, there are no systematic records of nationally and locally (Sussex or S.E. England) important species held at the Forest Centre. Indeed, very little is known about common species on the Forest. Surveying and monitoring must look at a wide range of species to establish i) their status on the Forest as a whole and then ii) the impacts on them of grazing. The Conservators should monitor the following groups:

12.3.1 Plants

i) Flora

The Ashdown Forest Flora (Rich and others 1996) is a comprehensive account of the flora of the Forest; the presence of a species is recorded in each kilometre square, covering the whole of the Forest area. There is some account of the abundance of each species. The whole Flora exercise should ideally be repeated, perhaps at the ten year anniversary, but in the absence of such a large undertaking, re-sampling squares inside and outside the grazing area could give an assessment of the effects of grazing.

ii) Vegetation map

The Ashdown Forest vegetation survey, carried out in 2000, gives an over-view of the plant communities. Any change in vegetation can be mapped and the effects of the grazing can be established.

iii) Other studies

A study focussing on the effects of grazing on heathland mire vegetation was carried out by Wirdnam (2003). The study was designed to be repeated periodically and will give information on the impacts of grazing over time.

12.3.2 Birds

The Ashdown Forest Bird Group members have been collecting data on Forest birds for 14 years. Some members of the Group have been directed to begin collecting information in a standardised way, using point transects within and without the grazing enclosure. Over a period of time, the impact of grazing on the bird fauna can be evaluated. These data will also show how bird populations on the Forest are varying in comparison with national trends.

12.3.3 Reptiles

Sampling of reptiles can be achieved using sheets of corrugated tin or roofing felt; the animals congregate under the sheet for the warmth and can be counted by lifting the sheets periodically (Sutherland 1996). Over the very large areas of ground under consideration, a proper assessment would require many sheets. A compromise number must be arrived at to take account of the labour available to be committed to the project.

12.3.4 Amphibians

The same ponds chosen for monitoring Odonata can be used for amphibians (5.i) below). Trial visits in the summer will determine whether amphibians are present in these ponds and at that point it will be decided whether or not estimates of population sizes will be relevant.

12.3.5 Invertebrates

i) Odonata

In 1999, a study of Odonata was carried on most of the water features on the Forest (Marrable 1999). By re-visiting streams and pools that are inside the grazing area, an assessment of the effect of grazing on their condition (turbidity, emergent and marginal vegetation etc.) and Odonata populations can be made. Again, a control set of pools outside the grazing area should be assessed.

ii) Lepidoptera

Three butterfly transects used to be undertaken by Forest staff. Following a training day organised by Butterfly Conservation and subsequent recruitment of volunteers, there are now 4 full survey transects plus 3 partial transects targeting silver-studded blues. These transacts cover heathland within and without the grazing areas.

iii) Other invertebrates

A team of entomologists has been contracted to devise a rigorous scheme for assessing the status of several difficult invertebrate groups. Two separate methods are operating, one to cover a wide range of animals and a second to look at ants only. See Appendix 2 and Appendix 3.

The Grazing Impact Assessment (GIA) (Offer and others 2003) offers a means of assessing the effects of grazing by predicting what the impact is likely to be on plants which are important for invertebrates (or reptiles *etc*.), either as food (foliage or nectar) or structure. Areas which are being considered for new grazing should be assessed using this protocol to inform the type of grazing in respect to numbers, grazing period and species.

12.3.6 Mammals

Mammals are difficult to survey and monitor. The status of mammals on Ashdown Forest is not known.

i) Small mammals

In the New Forest, grazing markedly reduced the number of small mammals (Putnam 1986). In the light of the habitat and food requirements of mice and voles and the known effects of grazing animals, this is unsurprising. However, what is surprising is that the numbers did not fall across all species – some sensitive species (eg bank voles) were completely absent (though the animals were present on near-by ungrazed areas) but others (eg wood mice) were not affected by the grazing.

If resources are forthcoming, monitoring effort should concentrate on water voles, harvest mice and dormice, as species of particular national conservation concern, to determine whether or not they are being affected by grazing.

ii) Other mammals

Lowland heathland is not an important habitat for foxes and badgers and they are unlikely to be affected by grazing.

Deer and rabbits are common on the Forest and are valuable because they provide some (unquantified) level of grazing and browsing. They are unlikely to be affected by domestic grazing and monitoring is a low priority.

12.4 Conclusion to monitoring

Whether or not the information provided by monitoring is used to support any application to extend fencing, the Conservators should be re-assured that the effects of grazing are indeed maintaining or improving the ecological value of the Forest at the species level in line with their management objectives.
If, as seems inevitable, some species decline under grazing, a decision must be made on how to react to that information.

Proper monitoring of the existing grazing scheme, along with clearly stated goals for the management of the Forest, represent criteria by which the grazing of the Forest can be said to be successful. However, in the absence of new objective data from monitoring, the Conservators and the other organisations concerned have already stated that the grazing should be extended and this goal is itself a management objective.

13. Conclusion

Grazing is an invaluable tool for the sustainable ecological management of lowland heathland. Also, the landscape of the Forest is, in most people's eyes, enhanced by the presence of grazing domestic animals. The Conservators have previously agreed that grazing should be extended in so far as there is the option to safely introduce livestock onto all the open areas of the Forest. The problems of re-introducing livestock onto common land are well-known (ironical, given that the common exists only due to the grazing offered over past centuries!) and they are explored fully in this report. Some solutions are also suggested, though they are disappointingly familiar – there does not appear to be any innovative solution to the problem of separating animals from cars. New fencing will be required.

The acquisition and husbandry of livestock are also explored. There are a limited number of animals which could be diverted immediately from the existing grazing scheme into any new enclosure. This would represent a short-term solution while the Conservators determine whether or not to become stockholders in their own right. Eventually, if grazing is to become as extensive as this work suggests, the Conservators will want to have direct control over at least part of the grazing herd.

The extension of grazing on the Forest is described fully in this report but implementation will proceed in a piecemeal fashion, dictated firstly by approval for fencing being granted by the Secretary of State and then by the Conservators' access to resources such as additional

livestock, in-bye land and man-power. Additional grazing will also be contingent on the success of the existing grazing, as determined by the results of ecological monitoring and public perception.

Consultation with a number of heathland wildlife site managers has shown that many are determined to introduce grazing. In every case, these managers are experiencing difficulties and it is a measure of how valuable they consider grazing to be that they continue. The Conservators will also face difficulties in the short term, but once grazing is made possible, the future of the Forest heathland will be more certain.

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Appendix 1 Details of each compartment

See p.67 for repeat of Figure 3 for reference.

	Name	Area (ha)	Perimeter (m)[1]	Main vegetation types	Pre-grazing work required	Natural water	Roads	Existing fences	Cattle Number[2]	Fence cost[3]	Recommendation
1	Radio Station	189.2	8246	Wet/dry heath, bracken, birch	Increase bracken mowing; scrub clearance	Yes	Yes	Yes	95	£18425 incl. 6 grids	Introduce grazing asap with perimeter fence of new road-side fences and improved boundary fences
2	Wrens Warren valley	164.6	6474	Wet/dry heath, gorse, bracken, birch	No	Yes	Yes	None effective	82	£31133 incl. 1 grid	Introduce grazing asap with permanent perimeter fence. Eventually combine blocks 2, 4, 11 into one compartment
3	Vachery	229.5	11412	All heathland types plus mixed woodland	Increase bracken mowing; scrub clearance	Yes	Yes: A22 & A275 (4920m)	No	115	£57354 incl. 3 grids	Introduce grazing asap with permanent perimeter fence.
4	Gills Lap valley	70.8	4181	All heathland types plus birch/oak woodland	No	Yes (seasonal?)	Yes	No	35	£26814 incl. 4 grids	Introduce grazing asap with permanent perimeter fence. Eventually combine blocks 4, 2, 11 into one compartment
5	Cripps Manor	33.3	2436	All heathland types with extensive bracken mowing and wet heath	No	Yes (seasonal?)	Yes	No	17	£10962	Introduce grazing asap with permanent perimeter fence. Eventually link to 15
6	Broadstone	53.7	4230	All heathland types plus birch/oak woodland	No	Yes	Yes	No	27	£19035	Introduce grazing asap with permanent perimeter fence. Eventually link to 6 across Ridge Road
7	Mardens Hill	51.5	4990	Dry heath and bracken: block of mature woodland	Increase bracken mowing; scrub clearance	Yes	Yes	Poor condition	26	£24455 incl. 1 grid	Introduce grazing asap with permanent perimeter fence.
8	Priory Road	29.0	3124	Wet/dry heath, bracken, birch/oak woodland	No	Yes	Yes	None effective	15	£16058 incl. 1 grid	Introduce grazing asap with permanent perimeter fence. Links to 22 and 26
9	Ardennes	36.1	4144	Acid grassland following prolonged	No	Yes	No	Yes, if existing	18	£13385 incl.	This is the most obvious expansion of the grazing

	Name	Area (ha)	Perimeter (m)[1]	Main vegetation types	Pre-grazing work required	Natural water	Roads	Existing fences	Cattle Number[2]	Fence cost[3]	Recommendation
				bracken mowing.				grazing fences remain		1 grid	enclosure, requiring only the additional fencing plus 1 cattle grid
10	Press Ridge	27.1	3387	Predominantly dry heath	No	No	Yes	Yes	14	£17191 incl. 3 grids	Introduce grazing asap with permanent perimeter fence.
11	Tile Lodge	16.6	2137	Predominantly dry heath with some bracken mowing	No	No	Yes	Yes	8	£9206 incl. 2 grids	Introduce grazing asap with permanent perimeter fence. Links to 11, 4 and 2
12	Ridge	38.3	4962	Dry heath and woodland	No	Yes (seasonal?)	Yes	Yes	19	£27539 incl. 4 grids	Introduce grazing asap with permanent perimeter fence. Links to 6, using grids to form open corridors (?)
13	Hindleap	18.0	2479	Predominantly dry heath	No	No	Yes	None effective	9	£17155 incl. 3 grids	Introduce grazing asap with permanent perimeter fence. Links to 21, using grids to form open corridors (?)
14	Legsheath	5.9	1039	Predominantly dry heath	No	No	No	No	3	£4675	Introduce grazing asap with temporary perimeter fence. Link to 16 and 26
15	Dallingridge	5.4	955	Dry heath with some valley wet heath	No	Yes	No	No	3	£4297	Introduce grazing asap with permanent perimeter fence. Links to 5
16	Goat car park	5.9	1136	Wet heath and scrub	Tree/scrub removal	Yes	Yes	No	3	£5112	Introduce grazing asap with temporary perimeter fence. Link to 25 and 28 to form a Forest "gateway"
17	Fairwarp	4.6	919	Dry heath and bracken mowing	No	No	Yes	No	2	£4136	Introduce grazing asap with temporary perimeter fence. Extend fence to include 19
18	New Road	12.1	2543	Dry heath with birch and bracken mowing	No	No	Yes	Yes	6	£5445	Introduce grazing asap with permanent perimeter fence. Links to 1, using grids to form open corridors (?)
19	Paynes Hill	9.9	2146	Dry heath and bracken mowing	Increase bracken mowing; scrub clearance	Yes	No	Yes	5	£5760	Introduce grazing asap with temporary perimeter fence

	Name	Area (ha)	Perimeter (m)[1]	Main vegetation types	Pre-grazing work required	Natural water	Roads	Existing fences	Cattle Number[2]	Fence cost[3]	Recommendation
20	Chelwood Common	5.6	1214	Mature heather, wet heath and some birch	Birch and gorse reduction	No	Yes	No	3	£5463	Introduce grazing asap with temporary perimeter fence
21	Twyford	3.0	773	Dry heath	Tree reduction	No	Yes	No	2	£3478	Introduce grazing asap with temporary perimeter fence. Links to 13, using grids to form open corridors (?)
22	Cherry Orchard	2.8	758	Bracken and birch	Bracken mowing	Yes	Yes; A22	No	1	£3411	Introduce grazing asap with temporary perimeter fence. Link to 8
23	Campfields Rough	2.1	642	Bracken	Bracken mowing	Yes	No	No	1	£2889	Temporary enclosure grazed by few animals
24	Nutley-Rough Ground	1.6	505	Bracken	Bracken mowing and birch removal	Yes	No	No	1	£2273	Introduce grazing asap with temporary perimeter fence. Link to 9
25	Goat Corner	2.1	674	Bracken	Bracken mowing or scrape	No	Yes	Yes	1	£2403	No intrinsic merit in grazing but forms Forest gateway with 16 and 28
26	Mudbrooks	1.6	685	Acid grassland with bracken mowing	Tree reduction	No	Yes	No	1	£3082	Introduce grazing asap with temporary perimeter fence. Link across Priory Road to 8
27	Streeters Rough	0.8	362	Trees, remnant heath, *Molinia*	Bracken mowing, tree/scrub reduction	Yes; mire	Yes	No	1	£1629	V. low priority but would benefit from grazing; temporary fences
28	Plawhatch	0.7	391	Bracken and scrub	Bracken mowing, tree/scrub reduction	No	Yes	Yes	1	£1170	No intrinsic merit in grazing but forms Forest gateway with 16 and 25
	TOTAL	1021.8	76944						514	343935	

Notes on Compartment Details:
1."Perimeter fence" in the context used above means a fence around the area to be grazed, rather than a perimeter following the Forest boundary.
2. "Cattle number" is based on one cow (or five sheep) / 2ha.
3. Fence cost calculated at £4.50 per metre, to include gates and stiles (R. McGibbon, *pers comm*.; Nix 2004). The 1996 Ashdown Forest fencing had one access point at an average distance of every 200 metres and this distance is used to calculate costs here.

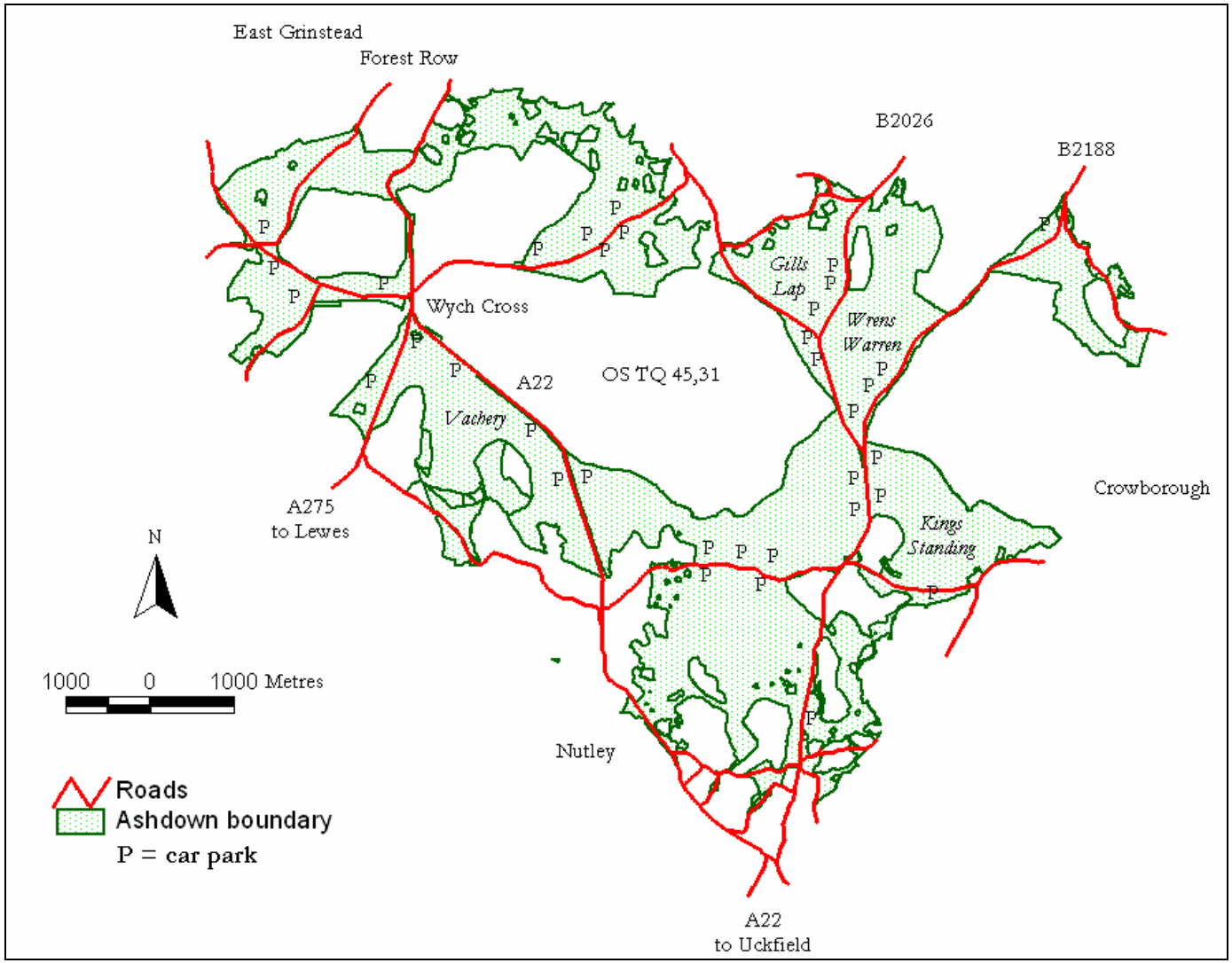

Figure 8. Ashdown Forest, East Sussex:

Appendix 2 A research project to further the understanding of invertebrate assemblages on Ashdown Forest in relation to grazing of heathland by livestock

This project provides comparative data on invertebrate assemblages in both grazed and ungrazed areas. It meets the Conservators' requirement to begin assessment of areas prior to grazing being introduced as well as new baseline data for the Forest. The project is funded by the Weald Heathland Initiative, English Nature and the Conservators of Ashdown Forest.

1. Identify nine quadrats, each approximately 1 square kilometre in area, three quadrats to be inside the existing grazing area and six quadrats to be outside. These numbers reflect the proportions of heathland inside and outside the grazing area on Ashdown Forest.
2. The research team will comprise four invertebrate specialists covering the following taxa: Arachnida, Coleoptera/Diptera, Hymenoptera/Heteroptera, Lepidoptera (looking for moth caterpillars). Other taxa will be also be recorded, eg Orthoptera.
3. Three pitfall traps will be set up in each quadrat.
4. The team will allocate four days for quadrat visits in the middle of April, May, June, July and August. The best three days will be used for data collection, the fourth day for identification and recording.
5. The team will visit three quadrats per day and spend 2 hours in each quadrat. They need not cover the quadrat systematically but will home in on habitat most appropriate to their speciality animals.
6. The data gathered will lead to the identification of invertebrate assemblages for different habitats. The effects of gazing on these assemblages will also be considered.
7. Though these data are essentially qualitative, the design will be such that some statistical analysis will be possible, particularly to compare variation between ungrazed sites with variation between grazed and ungrazed sites. Also, the method will be easy to replicate at a future date.
8. Cost:

	£
4 entomologists @ £230 each per day incl. mileage	920
4 days per month	3,680
5 months	18,400
report writing	1,600
	20,000

9. By agreement with project supervisors, costs could be reduced by sacrificing the number of months that sampling takes place.
10. The project will commence on 23 April 2004 and be completed following the hatch and identification of Lepidoptera in 2005.
11. An interim report will be submitted by 31 January 2005 and a final report by 31 March 2005. Copies of the reports will be circulated to all project supervisors.

Appendix 3 A research project funded by the Weald Heathland Initiative to identify the distribution of ants on heathland areas of Ashdown Forest

1. Ants will be assessed using transects of roofing tiles. Ants will be attracted to nest under the tiles due to the warmth trapped there.

2. Each transect will consist of a line of up to 20 tiles placed at 20 metre intervals.

3. There will be one line transect in each quadrat (See Appendix 2; there will be three quadrats inside the grazing area and six quadrats outside).

4. Assessment will be carried out once a year. The tiles will be lifted and any ants found sampled.

5. Identification is difficult and expertise outside of Forest staff will probably be required.

6. One off cost of £1000 to set up the transects; additional annual cost for identification.

7. The survey should be repeated for as long as possible but at least for five years.

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Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Middle left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell/English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
Paul Glendell/English Nature 24,888