New Forest SAC Management Plan

Part 3

Generic prescriptions

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3.1 Introduction

Part 3 of the cSAC Management Plan presents the issues which affect, or have the potential to affect, habitat condition of the cSAC habitats and the Inclosure woodlands. It sets out the generic management prescriptions required both to maintain those habitats in favourable condition, and to restore those habitats in unfavourable condition.

The management requirements of the vast majority of species for which the New Forest is designated (under SSSI, Ramsar, SPA or cSAC), or indeed for which it is of importance in relation to UK Biodiversity, are covered by these generic habitat management prescriptions. However, there are specific issues associated with certain species or groups of species which are given special protection under the Wildlife & Countryside Act and / or the Habitats Directive. Where relevant to this Management Plan these issues together with management guidance and advice are presented under Parts 1 and 3 (Issues) under the relevant sections dealing with flora and fauna particularly birds, reptiles and invertebrates.

3.2 Overarching management policy

A number of issues may affect the condition of each habitat; the choice of generic management prescriptions to address these issues depends upon the severity of their impact on habitat (or habitat unit) condition. Overarching management policies have been derived from the nature conservation objectives for each habitat, based upon whether the objective is to maintain a unit in favourable condition, or to restore a unit to favourable condition. Hence Condition Assessment is the principle determinant of which generic management prescriptions to follow.

3.3 Relationship between condition assessment, management policy and implementation programmes

The relationship between Condition Assessment monitoring, overarching management policy and Partners implementation programmes (Part 4's) is illustrated diagrammatically in Figure 3.3.1.

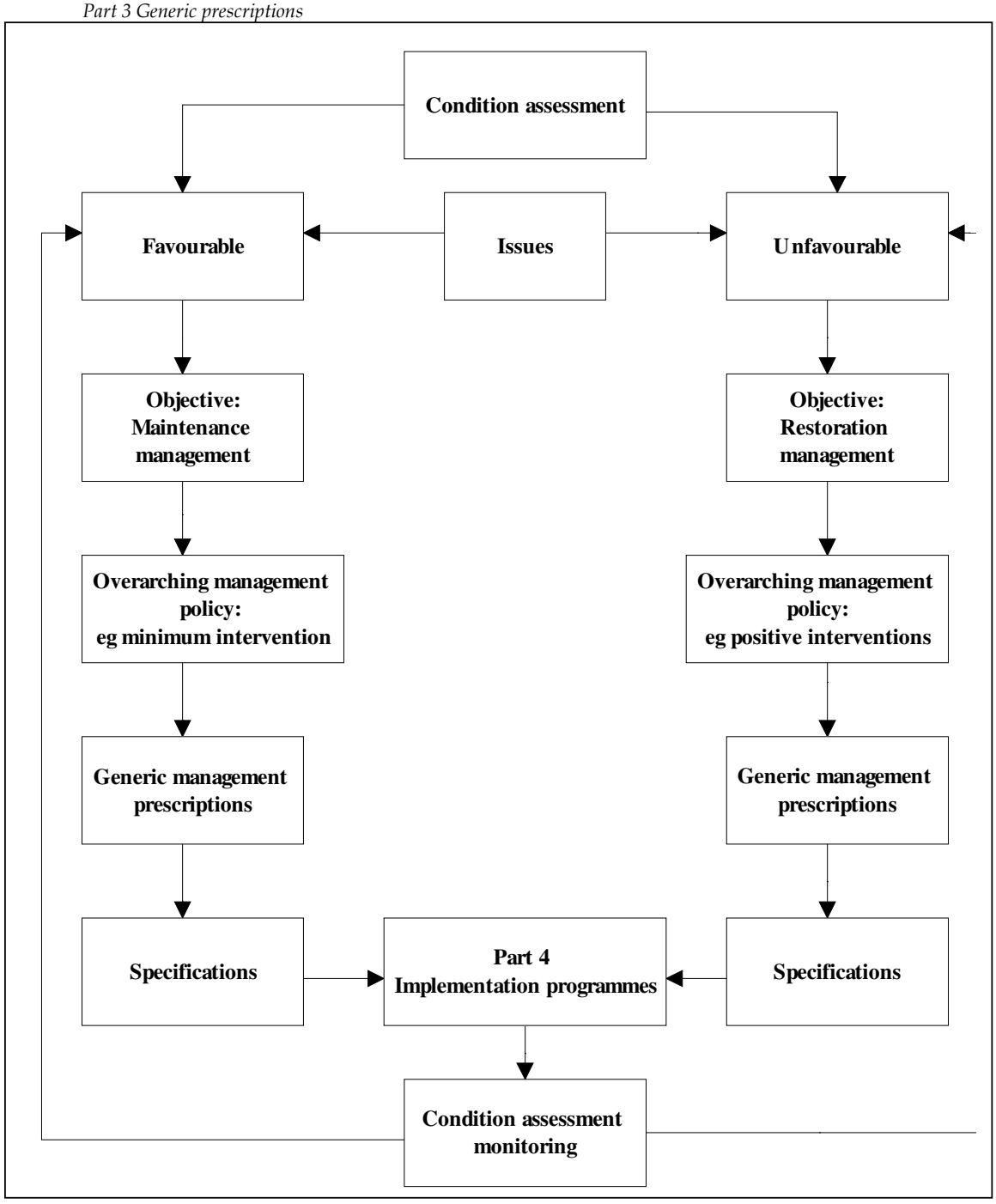


Figure 3.3.1: The relationship between Condition Assessment monitoring, overarching management policy and Partners implementation programmes (Part 4's)

3.4 Pasture woodland: issues, generic prescriptions & rationale

Introduction

This section discusses the issues affecting the condition of pasture woodland and sets out the generic management guidance and rationale required both to maintain those units currently in favourable condition, and to restore those units currently in unfavourable condition.

Whilst much of this section of the Management Plan is informed by the recent work of Peterken, Spencer & Field *(Plan for the Ancient & Ornamental Woodlands of the New Forest* 1999), some areas have been further developed in the light of more stringent requirements to maintain favourable condition under the Habitats Directive, and the recent changes to Forestry Commission management policy with the revised Ministers Mandate (1999 -2008).

Overall there is agreement that minimum intervention is the most appropriate management strategy for pasture woodlands in favourable condition. This means that management will only be carried out where intervention can be justified for the conservation of features of nature conservation or cultural heritage importance which are a significant part of the international value of the pasture woodlands. This implies that in many areas little activity other than maintenance grazing will occur.

Overarching policy

A number of issues may affect the condition of pasture woodland; the choice of management prescriptions to address these issues depends on the severity of their impact on unit condition. The following overarching management policy is derived from the nature conservation objectives for pasture woodland:

Where the objective is to maintain the unit in favourable condition, then the favoured management option will be one of minimal intervention implemented through a limited series of maintenance operations conforming to the policies and prescriptions under 3.4.2 A below.

Where the objective is to restore units to favourable condition, then additional management operations may be required in the short term, conforming to the policies and prescriptions under 3.4.2B below.

3.4.1 Issues affecting pasture woodlands

Significant issues affecting or having the potential to affect the condition of Pasture Woodland are listed in the following table, and are discussed below:

Issues pertaining to management required to maintain favourable condition		**Issues pertaining to management required to restore favourable condition**
Woodland Regeneration: The importance of depasturing stock & the impacts of grazing levels.		Trapped pre-Inclosure pasture woodland Emergent woodland Open space & shading: Pollarding & holly pollarding Potential of the restoration of grazing : Impact on flora & fauna.
Stock feeding		Tree canopy collapse Tree & shrub recruitment
Stock pesticide treatments		Bracken management
Standing & Fallen Deadwood: Importance as habitat & in woodland regeneration Firewood collection		Inadequate deadwood resource
Native tree management Veteran trees and public safety.		Management of Regeneration Plots
Deer: species and impact		Non-native tree & shrub management
Grey Squirrel		Drainage & soil disturbance
		Recreation: Camp Sites & Car Parks

Issue 1. Woodland regeneration: the importance of depasturing & the impacts of grazing levels

The de-pasturing of domestic stock has long played an important role in defining the structure and nature of the New Forest pasture woodlands, developing and maintaining a high forest tree canopy interspersed with glades in a mosaic of other woodland and heathland habitats. The open aspect, long continuity of tree cover and the presence of high numbers of ancient trees has resulted in the development of exceptionally rich habitats, particularly for saproxylic invertebrates, epiphytic lichens and bryophytes, fungi and breeding birds. (See Part 1 for description and Part 2 for evaluation).

In common with other habitats favourable condition depends on grazing pressure being within acceptable levels; neither too high nor too low. The pulsed phases of tree regeneration in response to lower stocking or reduced deer population levels are well documented. Tubbs and Peterken (1965) identify three periods of tree regeneration: 1600-1750 when most of the current large beech, oak and holly originated, 1850-1900 following reduced grazing pressure as a result of implementation of the Deer Removal Act of 1851, and 1940-1960 in response to wartime pasturage reductions. The last pulse of widespread regeneration ended with increased common rights pasturage on the Open Forest, increased access by ponies and cattle to Inclosures and a rise in deer populations. This does not mean that no regeneration has occurred between these pulses; it manifestly has. For example we are currently (2000) in a period of high stocking levels and high deer

numbers, yet nevertheless, there is active natural regeneration occurring in parts of the pasture woodland complex to this day.

It is apparent (eg Chatters and Sanderson 1994) that the severe reduction or absence of domestic stock grazing from wood pasture systems results in the rapid regeneration of trees and shrubs with a consequent loss of open ground and changes in light condition and micro-climate. The special interest features, particularly lichens and bryophytes, respond negatively to such change and the system becomes poorer over time, for nature conservation (eg Woodfidley, Roydon Woods)

On the other hand excessive grazing, especially in combination with other activities which also reduce habitat structural diversity (particularly removal of dead and fallen trees), can severely limit tree regeneration, at least in the short term. It will also, by reducing flowering, decrease the overall availability of nectar sources for woodland invertebrates, and may if sufficient food sources are not available in nearby inclosed woodland, impact on important invertebrate populations.

Canopy collapse

Over time, as existing trees age and die, woodland cover will gradually retreat if regeneration is absent for long periods. Oak are long-lived, beech less so and it is evident that the older beech dominated stands which originated after the fellings of the late 17th century, are now 250-300 years old and not surprisingly many are disintegrating. They are undoubtedly increasingly vulnerable to natural events such as the weakening effects of alternate wet and dry hot summers and storms of the kind experienced in 1987 and 1990. There is evidence that a canopy gap which results in the sudden exposure of ageing beech trees accelerates disintegration and death; gaps tend to get larger as trees on the margin are more likely to get blown over or die.

The FC survey of 1996 revealed that some 5% (172 ha) of the pasture woodlands on the Crown lands show signs of canopy collapse, with some 15% of their area having suffered severe collapse in recent years. The ten most seriously affected woods are Berry, Bratley, Denny, Eyeworth, Mark Ash, Ridley, Stricknage, Studley, Undersley and Vinney Ridge. (This does not include those sites eg Hollands Wood, where the provision of camp sites has resulted in severe reduction in canopy). Regeneration is least likely for those woods located on acid soils and dry ridges (Berry, Bratley and Mark Ash woods), where open ground under current management tends to develop swards of bracken and grass, rather than a protective growth of hawthorn, holly, blackthorn or bramble which readily colonise the more clay rich soils. Whilst Undersley and Vinney Ridge woods are located on similar soils, their relatively small size and protected location surrounded by Inclosures offers opportunities for greater control of browsing damage and thus makes them easier sites for nurturing natural regeneration. For woods on the heavier clay soils, (Eyeworth, Studley, Stricknage), conditions for natural regeneration tend to be more favourable and in Stricknage Wood for example, there is a strong representation of younger trees elsewhere in the wood, to confirm that progressive regeneration can be assured.

There can be no regeneration without gaps developing in the canopy, a natural process and many species are dependent upon alternating light and dark phases of open and closed canopy. In the total absence of regeneration woodland cover would over time retreat towards parkland as the canopy decreased to less than 30% cover. It should be noted here that parkland is a stable (over many centuries) habitat and one which can be rich and varied in its own right.

Tree recruitment

Recruitment beneath the existing woodland canopy will generally lead to the development of beech whilst open grassy glades will be colonised with oak. Oak regenerates well in short grass with light cattle grazing, but seedlings often get smothered under bracken, grow poorly amongst heather and are shaded out under most established trees and shrubs. Heavy masts occur every 5-7 years on average, producing enough acorns to overcome predation by pigeons, squirrels and voles. Sapling oaks are browsed to differing degrees by deer, ponies and cattle, though they may survive for decades as bitten down shrubs.

Unlike oak, beech is adapted to grow in shade and saplings can thrive beneath small gaps amongst dense scrub. Unless the woods are kept open by pasturage, they are likely to change from dominance by oak to dominance by beech, simply because as time passes, regeneration within the shade of established woodland will favour the shade-bearing beech. In the past this has been artificially amplified by the preferential felling of oak, the more valuable timber tree. The Forestry Commission intend to address this issue by favouring oak against beech whenever and wherever possible but only by minor forms of intervention.

Birch is native to the Forest and plays an important role in woodland regeneration. It is generally a short lived tree, (though veterans do exist which play an important role in the ecology of the Forest), with abundant tiny seeds that readily colonise suitable habitats. The shading effect of birch is sufficient to seriously suppress dense stands of bracken, but insufficient to inhibit the regeneration of shade tolerant species such as beech and holly. Where birch has sprung up with oak, the oak is much more likely to persist and eventually replace the birch woods as they slowly succumb to age at about 80-100 years. Birch woods admixed with occasional oak, and slowly recruiting beech and holly, will eventually develop as oak-rich pasture woodland, where areas of denser birch give way to open ground or lawn between more widely spaced long-lived trees.

Foresters are concerned that recruitment of oak has been less than necessary to sustain the pasture woodlands. They point to the flushes of regeneration achieved in both World Wars (1914-45), as evidence of the pressure on regeneration from the livestock. Whilst accepting that grazing by livestock is an essential feature for conserving the pasture woodlands they remain concerned that a static pressure of grazing prevents regeneration. Ecologists maintain that grazing pressure is not static; it varies over time and in their view this variation has to date remained within ecologically acceptable limits for the New Forest ecosystem as a whole. Pulses of regeneration in response to relaxed grazing pressure are followed by periods of

reduced regeneration when grazing pressure is higher (eg Flower 1980). Even in the current period of high grazing levels and deer numbers regeneration of oak and beech is apparent in many pasture woodlands, (eg Redshoot Wood) particularly where saplings are afforded protection by fallen dead wood and scrub growth. It is the ecologists view that regeneration of oak and beech under a variable grazing regime is sufficient to maintain the special interest features associated with pasture woodland. However, in view of the difference of opinion over regeneration of pasture woodland it is apparent that further monitoring studies would be useful over time to provide more information before agreed definitive conclusions can be reached.

In this regard a recent theory proposed by Vera (1998), and expanded in his book *Grazing Ecology and Forest History (2000)* would appear to be fundamental. His thesis is that the model of the former wildwood being substantially closed canopy forest is incorrect. He argues that the landscape was more probably a mosaic of scrub, grassland and groves of high forest maintained by the grazing of large herds of aurochs, deer, elk and bison. A key part of his argument is that the pollen record has been misinterpreted and is consistent with a landscape that was more like wood pasture than closed high forest.

Vera summarises his theory thus:

"Young oaks and other tree species grow up in scrub or in the mantle and fringe vegetation of groves with a closed canopy. The grove advances into the grassland at the speed of blackthorn advancing into grasslands by the underground rootstock. Solitary trees come up together with solitary hawthorns. Within the groves no regeneration takes place because of the shade cast by the canopy. If a gap is formed, grasses will establish there and attract large herbivores. Their grazing and trampling will prevent seedlings from coming up there. So they prevent the regeneration of trees in gaps of the canopy. As more trees die or are windblown, the grassland increases. In this way, ultimately the grove degenerates into grassland, as is known and described in retrogressive succession. In the long run, light demanding thorny shrubs will establish in the grassland, protecting young trees against the large herbivores. So the succession is: grassland > thorny shrubs > grove > grassland > thorny shrubs > grove, etc. I call this theory the cyclical turnover of vegetation".

This theory based on vegetation dynamics at the ecosystem scale is hugely appealing and is highly significant for ecologists and foresters alike. It is highly consistent with what happens in the New Forest.

When considering measures to boost the natural regeneration process it must be remembered that the Forest is an extensive system with the ability to manifest and accommodate natural expansion and contraction of wood pasture cover over time. Thus, if local elements are contracting towards a temporary parkland phase (in the face of current high grazing levels), providing other units are expanding elsewhere then intervention may not be required. Sunny, well-lit old trees are richer in a variety of plants and animals than shaded trees, however old or rotten. A long-term view is required.

Issue 2. Stock feeding

The provision of animal feed (other than holly browse from the agreed pollarding programme) in pasture woodland artificially increases the feeding capacity of Forest habitats above that which is naturally sustainable, with consequent adverse effects (eg upon ground flora, tree regeneration) and leads to localised nutrient enrichment and adverse changes in plant communities, when un-utilised feed is left to decay. Pasture woodland is not an appropriate habitat for stock feeding and there are no recognised sites for commoners use.

Issue 3. Pesticide treatments

Treatment of domestic stock with certain chemical pesticides may have adverse impacts on many non-target invertebrate groups. Current use by the Verderers of a Pyratape wormer (Strongyd-P) may be benign. However whilst this is an effective equine wormer it does not affect bot fly infestations - a significant issue for New Forest ponies. Avermectins and closely related products would appear to be effective against both infestations but pose serious threats to invertebrates. Benzimadazoles are thought to have a negligible effect on dung fauna but it is not known how damaging such chemicals are to aquatic Crustacea, clearly an important issue in the Forest.

Commoners treat cattle themselves and may well use Avermectins, but this is largely carried out off the Forest. Sufficient time may therefore lapse for the toxicity of dung to reduce before the animals are brought back onto the Forest.

It is clearly an area for further research before any statements can be sensibly made about which treatments (if any) are acceptably benign to important invertebrate groups. A project should be initiated which:

- reviews current practice;
- reviews the toxicity profiles of current products in use in the Forest, and those for which there may be a likely demand in the future;
- determines the risk of exposure to dung and aquatic invertebrate communities;
- explores alternative management strategies to avoid contamination, and where avoidance is impractical ensures that only benign treatments are used on Forest stock.

Issue 4. Standing and fallen deadwood: Its role as habitat and in woodland regeneration

The importance of dead-wood habitat is described in Part 2. Removal of dead wood, either standing or fallen, directly reduces habitat availability for saproxylic invertebrates, fungi and other species and interferes with the crucial natural processes of nutrient recycling through decay and decomposition.

Where there is an issue of inadequate tree regeneration as a result of grazing levels being too high, the situation is compounded by the collection and removal of dead wood and fallen trees (Morgan 1991). Crucially, the presence of patches of scrub, brash and fallen trees provide sanctuary from grazing, allowing seedlings to survive and regenerate, during periods of high stocking levels and high deer numbers. However, if such protection is removed then regeneration can reduce to zero, and in areas previously affected by windthrow and excessive fallen tree removal, gaps in the tree canopy increase and a more parkland-like structure can develop (eg Mark Ash Wood).

Issue 5. Bracken: It's impact upon tree regeneration

Bracken today does not enjoy its former status as a desirable product of the Forest. As it is not harvested on anything like the scale of previous centuries, it has probably become more prominent. It undoubtedly has the potential to impact both negatively and positively upon other species and natural processes. It's impact upon tree regeneration in the pasture woodlands may be of local concern, not generally on the heavy soils, where bracken growth is naturally limited, but more on the sands and gravels. Whilst it is true that bracken fronds shade seedlings and bracken litter may smother them, it also plays a significant role in sheltering oak regeneration. Bracken is reduced or eliminated on well used tracks and there are usually other openings through which some saplings may grow. In general bracken tends more to delay rather than prevent regeneration, and may act to space out regeneration thereby encouraging large, spreading trees.

Cattle and ponies trample young bracken and litter and ponies eat it in late July / September when it's toxicity level has reduced, so undergrazing can prevent sufficient gaps in the bracken stand for trees to establish. Cutting can be indiscriminate and is clearly capable of removing all regeneration from repeatedly cut areas. Pigs are turned out on the Forest under rights of mast to coincide with the autumn fall of acorns and beech mast. In addition to the beneficial impact of removing a high proportion of the green acorns which can be fatal to livestock when eaten in excess, the rooting activities of (non-ringed) pigs can break up deep bracken litter beds and help to provide suitable conditions for tree regeneration.

It is accepted that there is a case for localised bracken control where regeneration is sought especially on the acid soils and dry ridges such as Vinney Ridge or Bratley Wood.

Issue 6. Veteran trees and public safety

Native veteran trees (including old growth holly, birch and hawthorn) and the products which they shed on ageing (leaf litter, twigs, branches, boughs and eventually fallen boles or whole trees) are fundamental to the ecology of the pasture woodlands.

Landowners have a duty of care to protect the public and others from dangerous features on their land under the Occupiers Liability Act 1957. There is a view that

veteran trees with extensive quantities of dead standing wood are potentially dangerous especially when in the immediate vicinity of recreational hot spots such as car parks and camp sites. These two factors have led to a significant reduction in veteran tress and dead standing wood in the New Forest this century. For example Cox and Rose (1996) record that 84% of mature trees have been removed from Hollands Wood Camp Site since its establishment in the late 1960's. It is apparent that the siting of recreational facilities within pasture woodlands leads to a dramatic decline in the nature conservation value of that woodland.

Issue 7. Soil disturbance and drainage : adverse impacts

Considerable levels of soil disturbance occur naturally in woodlands through the agencies of windthrow and the activities of woodland animals. The commoners right of mast, the right to turn pigs out in the pannage season to take advantage of the autumn seed crop, creates localised seasonal soil disturbance. These are positive impacts providing niche diversification and are important precursors to natural regeneration.

Whilst such processes have contributed to soil disturbance in the past and will continue to do so in the future, the New Forest pasture woodlands have an additional legacy of surface scarring largely attributable to previous activities associated with mechanical timber extraction and provision of drainage systems. Resulting soil compaction, and reduction in wetland habitat diversity impoverish the woodlands for wildlife, and reduce their capacity to support commonable stock in periods of drought.

Issue 8. Native tree management: species composition and tree morphology

The composition and morphology of native trees and shrubs in the pasture woodlands has evolved in response to a long history of stock grazing, former timber exploitation and physical interventions eg pollarding which ceased about 150 years ago (Sanderson 1991). Hence, whilst oak, beech and holly are in abundance, other species characteristic of ancient woodland in southern England, such as small-leaved lime, are virtually absent. The re-introduction or artificial bolstering of such species is considered inappropriate and no deliberate introduction of native trees will take place within the pasture woodlands.

However, there is a case for re-instating a pollarding programme on young generation trees to ensure continuity of ancient tree habitats and to retain the character of the woodlands. The large trees characteristic of the Pasture Woodlands were generated :

- by growing up in relatively open conditions;
- as a by-product of pollarding;
- by growing for at least 150 years.

In the long run, such trees can only remain part of the Forest scene if conditions are created in which new large, spreading trees can develop. Trees can be pollarded for centuries. Even when old and hollow new growth springs vigorously from cut limbs. However, most of the New Forest pollards have not been cut since the early eighteenth century in the case of oak, the early nineteenth century in the case of beech and the twentieth century in the case of holly. Once pollarding has ceased for this long, new growth after resumed pollarding is less vigorous, and the decay is more likely to weaken the trees and, in the case of beech, often results in death.

However, young trees (less than 50 years old) usually respond well to pollarding as is demonstrated by the successful experimental pollarding of holly and beech. It is technically possible therefore to re-introduce pollarding on younger specimens to ensure that a new generation of ancient trees with spreading branches will replace existing veterans in the twenty second century. Pollarding of young beech specimens may prove to be a useful technique of canopy manipulation to favour oak regeneration.

Holly: Holly is present as a dense scrub layer in many pasture woodlands. Its prominence is thought to be a result of the dramatic reduction in deer grazing following the 1851 Deer Removal Act. The need to pollard holly to supply winter feed to deer also ended with the implementation of this Act. Whilst it is a characteristic and valued component of the pasture woodlands, supporting important lichen communities and providing nectar source for woodland insects, it can become rather dominant casting dense shade on ground flora and surrounding epiphytic lichen communities. In such situations a loss of species less tolerant of dense shading results (eg *Pannaria conoplea* in Shave Wood and *Catinaria grossa* in

South Ocknell Wood), and intervention through holly pollarding and / or coppicing is desirable. In the Crown lands some 26% of all woodland has a dense holly understorey which has been identified as posing a threat to lichen communities.

Any holly pollarding / coppicing programme must recognise that some old hollies (especially old well lit pollards) have their own special associated species and that holly holms are an internationally rare woodland type.

Issue 9. Deer: impact on pasture woodland

Current estimates of deer numbers across the Crown lands as a whole, proposals presented in Putman & Langbein (1999) for more sustainable populations, and current distributions are given in the table below.

This table demonstrates that of the four established species in the Forest only Fallow are present in high numbers and widespread. Red and Sika are localised and present in fairly low numbers and Roe are restricted (largely by suitable habitat) to the fringes of the Forest and it's more suitable surrounding wooded estates. Whilst fallow, in view of their higher population numbers and widespread distribution, have the largest potential impact on pasture woodlands, their preferential grazing habit and ability to feed over wide areas including the Inclosures and adjoining farmland, means that they are less dependent upon the Open Forest than domestic stock. Overall their relative impact on the woodland sward is minimal though they may have a more significant impact on tree regeneration.

Species	Current Estimated Population Size	Recommended sustainable population size (After Putman & Langbein 1999)	Current Distribution (1999)
Fallow Deer	2,040	1,200	Widespread but 75% of numbers (1998 census) concentrated in central most extensively wooded habitats.
Red Deer	100	100	Concentrated in 3 separate herds: 60 head near Ober Heath 20 head centred south-east of A31 20 head centred around Matley Heath
Sika Deer	100	100	Largely confined to an area south of the Southampton to Bournemouth railway.
Roe Deer	300+	Up to 400	Forest fringes
Muntjac Deer	Present but not yet established	Prevent population establishment	Unknown

Issue 10. Grey squirrels: impact on pasture woodland

Grey squirrels were imported from eastern North America in the early 20th century. They strip bark from tall saplings and small trees, thus killing leading shoots and admitting rot to trunks and branches. They are particularly attracted to young and planted beech, and thus potentially threaten one of the principal species of the

pasture woodlands. Bark stripping from the branches and bases of ancient trees has also been recorded and is believed to contribute to their decline. Squirrel damage to existing mature trees does not appear to seriously impair beech recruitment from natural regeneration. Although squirrel control continues across the New Forest it has been unable to significantly reduce the size of the population and the damage it causes.

Of primary concern is the impact that grey squirrels have on the long term continuity of large ancient beech trees. Though the damage inflicted creates rot holes and deadwood habitat in trees at a fairly young age (in some cases creating a young generation of new pollards), it is not possible to predict how long such damaged trees might survive, particularly where damage to the basal root buttresses may weaken the mechanical strength of the trees as they get older and heavier. With so many of the rarer lichen and fungal species dependent upon ancient beech trees it is a concern that damage from grey squirrels may compromise our ability to ensure a continuity of such trees into the future.

This issue becomes more acute when tree regeneration is minimal in the face of high grazing and browsing pressure and removal of fallen trees. In times of high regeneration it is more likely that some trees will reach mature size without serious squirrel damage.

Issue 11. Regeneration plots: former purpose, current condition and their future

In response to the foresters view that within the Crown lands the long-term future of the pasture woodlands was endangered through a lack of regeneration, the New Forest Acts of 1949 and 1964 provided the Forestry Commission with the powers to enclose, plant, thin and fell, in order to promote regeneration. Experimental regeneration plots (ranging in size between 1.6 ha and 9.0 ha) were established between 1953 and 1966, covering a total of 287 ha (from Spencer, Peterken & Field 1999). Within each plot the existing trees were group felled or heavily thinned and either re-planted or left to regenerate naturally. Fencing was not adequately maintained and the plots have generally been subject to varying levels of grazing from commoners stock incursions or deer over the period. The majority of the regeneration plots were surveyed in 1996 by Spencer who noted four stand classes:

a. Stands of mixed planted and self sown oak, beech and birch (with occasional self sown natives such as sallow, rowan and ash). Usually closely spaced young high forest stands. Some of these have been thinned to plantation-like stands of oak and beech in recent years.

b. Stands similar to the above but with additional planted stems of non-native trees including Scots pine, larch and southern beech.

c. Stands similar to above but with additional planted stems of native trees that are considered inappropriate to the site eg beech planted within former pure oak stands as at Pinnick Wood and the Noads.

d. Stands where the canopy has been thinned rather than clear felled and natural regeneration of birch, holly and some beech (along with rowan, whitebeam and very occasionally oak) have regenerated within the wood.

There is considerable variation in the condition of these plots and the extent to which they are in-keeping with the character of the surrounding pasture woodland. Most provide ideal opportunities for extensive pollard and glade creation to make them indistinguishable from the surrounding pasture woodland. It is accepted that all regeneration plots will be brought (where necessary), to a condition where they can be integrated into the adjacent pasture woodlands.

Issue 12. Former wood pasture enclosed within silvicultural Inclosures: issues relating to future management

A: Within the Crown lands

Approximately 400 ha of pasture woodland was incorporated within 18th and 19th century silvicultural Inclosures. Whilst in principle much of this has been released from the grazing pressure of the Open Forest, in practice the majority have been subject to periods of fluctuating grazing pressure from deer and unauthorised incursions of commoners stock. They maintain most of the characteristics of the Open Forest pasture woodlands and there has been much recent debate on how best to maintain this interest in perpetuity.

Open Forest pasture woodland is dependent upon Open Forest grazing management to maintain it's special interest. Significant decrease in such grazing, or reliance upon deer grazing alone will not maintain the interest, and the priority on such old growth stands is to return them to Open Forest management as soon as is practicable. The exception is Denny Wood where there is a case for not disrupting the long history of monitoring work that has been carried out there, though even here, the transect has been grazed in the past and indeed continues to be grazed by a variety of large herbivores.

It has been suggested that these old growth stands could provide a refuge for species intolerant of high grazing pressure, and therefore they should not be returned to the Open Forest. However, such management is incompatible with maintaining the primary international interest features and cannot be sanctioned. The strict control of grazing within selected Inclosures together with diversification of the woodland as described in Section 3.7 will provide conditions for grazing intolerant species. It should be noted that there is a considerable resource of un-grazed semi-natural woodland habitat within the Heritage Area and proposed National Park boundary supporting plant and animal communities adapted to such conditions, and providing a pool from which possible expansion into suitably created habitat within Inclosure woodland may in time occur.

B: Outside the Crown lands

There are former pasture woodlands with surviving relic old growth features principally at Roydon, Franchise and Langley Woods. These are separated to a greater or lesser extent from Open Forest grazing management, the return of which would be impractical. However, the opportunity exists at Langley Wood to consider the practicalities and desirability of restoring managed grazing within former wood pasture and it is recommended that a feasibility study to explore the pros and cons of such a re-introduction be conducted. At Roydon Woods the Hampshire Wildlife Trust have taken the opportunity to re-introduce managed grazing into former wood pasture habitats.

Issue 13. Emergent woodland: The issue of tree regeneration on adjacent habitats

Following the Deer Removal Act of 1851 there was a burst of regeneration within existing woods and on the Open Forest. Regeneration within existing woods largely comprised beech and oak, which have long since reached the canopy but in some woods - perhaps the most shaded - it allowed an understorey of dense holly to develop. Regeneration on the Open Forest was more mixed and has continued at intervals during the 20th century. The result has been the 'emergent woods'. They are well distributed growing up in glades and on the margins of existing woods. Birch woodland is included in this category and also develops as fringes around established blocks of beech and oak woodland.

The propensity of birch to colonise adjacent heaths and lawns has the potential to adversely impact on the favourable condition of these important habitats. It is also seen as a threat to grazing. However the natural woodland edge fluctuations are an important aspect of the Forest ecology and the transition habitats so created are important for a variety of nature conservation interests. It does raise a management issue of when to intervene and remove invading birch (in particular) from other habitats which if left unchecked may result in a decline in favourable condition. Generally, closed canopy emergent woodland (as opposed to scrub and parkland type habitats) adds little to the value of wood margin habitat.

Issue 14. Non-native and re-introduced trees and shrubs

A number of non-native trees and shrubs have in the past either been deliberately planted within the pasture woodlands or have colonised naturally from elsewhere. Spencer (1996) estimates that some 135 ha of Crown Land pasture woodland is affected; figures are not currently available from non-Crown Land woodland. The impact of these infestations varies between species and their locations. However all take up space which could otherwise support native species and may constrain regeneration of native trees and they tend to support a more generalised and less interesting flora and fauna. If allowed to spread they will inevitably reduce the nature conservation value of the pasture woodlands and other habitats.

***Rhododendron ponticum*:** This is a highly invasive shrub, native of Asia Minor and the Iberian Peninsula, introduced to this country as an ornamental garden species. It has the capacity to cover huge areas of woodland soil in dense monospecific stands

excluding all native species. In the pasture woodlands on the Crown lands there is around 50 ha of infestation, most extensively around Hincheslea, Malwood, Philipshill and Lyndhurst / Bramble Hill.

Gaultheria shallon: This is an invasive ericaceous shrub from north west America which spreads inexorably by a system of underground rhizomes. Its leathery leaves resist penetration of herbicides and once established it dominates the ground and understorey layers of both wood and heath. There is a major infestation covering up to 12 ha south of Fletchers Hill near the Rhinefield Hotel. Small patches are known elsewhere, eg on heathland at Roydon Woods.

Sycamore: A late medieval introduction to Britain, a 19th century introduction to the Open Forest, it seeds freely almost everywhere and has great invasive capacity where conditions are favourable. A local issue in the Forest as grazing has probably constrained its spread. However, small areas eg Denny Wood and Matley Wood contain an abundance of Sycamore.

Turkey Oak: Introduced into Britain, probably from the Balkans around 1750, though arrived in the New Forest in the late 19th or early 20th century. It is invasive and is found in pockets throughout the Forest, usually present as a small number of mature trees amongst a host of younger stems. It is of little timber value as it is prone to warping and shrinkage. More significantly the knopper gall that infests native oaks is dependent upon the presence of turkey oak to complete its life cycle. Turkey oak is also thought to hybridise with both native oaks. Its presence thus compromises the future of native oak in the New Forest and its successful regeneration.

Sweet Chestnut: Introduced to Britain by the Romans as a source of nuts for food. It was recorded as early as the 14th century in the New Forest in an account roll of Edward III in the form of a chestnut wood. It is now an integral part of the historic landscape, especially as a component of the Inclosure plantings of the 19th century. Although its nuts are valued as winter food for wildlife, as a non-native tree, it does not support the wealth of insects and lichens that are found on mature native oak and beech. It is not very windfirm, tending to fall over when mature and then resprout vigorously. The leaf litter of Sweet Chestnut is rich in tannins and breaks down very slowly, creating soil conditions that do not favour woodland herbs and mosses. It is not an aggressively invasive species, though does spread slowly on sandier acid soils.

Red Oak: Introduced to Britain from North America as an amenity tree. It was widely planted in the 19th century and is found in a number of locations. As with Sweet Chestnut it does not support a rich insect or lichen community. It is not aggressively invasive but will spread slowly within established woods.

Hornbeam: A 19th century introduction to the Forest but one which can be regarded a the man-assisted arrival of a native species that would have spread to the Forest anyway at some time.

Scots pine: There is evidence of its occurrence in the prehistoric past but Scots pine present today has arisen from recently introduced stock. A small amount was possibly planted on adjacent commons in the 18th century, but there is no written evidence of its presence in the New Forest until 1823 (Tubbs 1986). It is a highly invasive species which has subsequently spread over heathland and woodland alike, and has resulted in the need for recurrent management to exert control over its expansion. Where dense stands occur in the pasture woodlands they act as significant constraint on regeneration of native species. Whilst undoubtedly valued by some as a landscape feature Scots pine does not support a rich fauna or flora, though arguably now has secondary value in providing shelter to localised groves of ancient beech prone to windlblow.

Other Species: A number of other non-native species have been planted in the pasture woodlands in more recent times. These include various conifer species such as western hemlock, Douglas fir, Lawsons cypress and Norway spruce and broadleaf species such as hybrid lime. The majority of conifers occur as limited numbers of self-sown trees, though occasionally they may occur as established tall tress of some stature.

Issue 15. Recreation

A general description of the current recreational activities and their impacts on nature conservation is given in Part 1. This section focuses on those specific recreational activities which have become significant issues for pasture woodland given their impact on habitat condition.

Most of the activities described in Part 1 occur in the pasture woodlands. It is however the location of car parks and camp sites within pasture woodland units which have created by far the biggest impact on their nature conservation interest. Impacts from the other major forms of recreation have not to date contributed to a decline in favourable condition of pasture woodland.

Car parks and camp sites: their impact on pasture woodland

There is a recognised and fundamental incompatibility in locating high concentrations of people, their equipment and vehicles within close proximity of veteran trees. Inevitably, health and safety considerations have resulted in extensive removal or vigorous tree surgery of ancient trees over time in these sites. In addition, the development of camp site and car park infrastructure and the physical trampling of ground vegetation has dramatically impoverished the ground vegetation, replacing it with artificial tracks, hard stands and species poor grassland. These impacts are progressive and striking. However there are other more subtle changes and impacts which contribute to affected units remaining in unfavourable declining condition:

- reduction in lichen flora from tree removal, pollution, drying out and increased drainage;

- removal of ground flora and increase in bare and compacted ground;
- removal of dead standing and fallen wood;
- long-term impact on regeneration and viability;
- reduction in capacity to support range of organisms and traditional management;
- progressive decline.

Location of car parks and camp sites in or adjacent to pasture woodland

As a matter of principle hard recreational facilities cannot be sustained in heavily treed areas of pasture woodland. A programme to consider each facility will be required, but in the meantime 34 car parks and 3 camp sites require immediate consideration for relocation or re-design in the short to medium term.

Other recreational activities: To date the other main recreational activities pursued in pasture woodlands (walking, horse riding and unauthorised cycling) have not contributed to a decline in favourable condition. Future planning for improvements in recreational facilities (eg formalising of footpaths through pasture woodland) should recognise the conflict and incompatibility of generating high numbers of people in woodland containing veteran trees.

3.4.2 Generic management policies & rationale for pasture woodland

3.4.2A For maintaining pasture woodland units in favourable condition

Overarching Management Policy: ***Where the objective is to maintain the unit in favourable condition, then the favoured management option will be one of minimal intervention implemented through a limited series of maintenance operations conforming to the generic prescriptions below.***

Management Prescriptions: Implementation of the Minimum Intervention Policy requires:

- continued de-pasturing of commoners stock, (ponies, cattle and pigs during pannage);
- no stock feeding;
- no use of anti-parasitic drugs likely to damage non-target species;
- no planting of trees, shrubs or herbs;
- a general presumption against fencing, particularly in the long term;
- no new drainage schemes or maintenance of old or existing drains except where there is a proven requirement under health and safety or protection of dwellings or roads from flooding;
- no felling or lopping of native trees, other than pollarding, will be undertaken unless required for public safety (see below);
- continued pollarding of holly on a small-and-often scale to maintain cover within Condition Assessment target;
- some trees preferably in the range 5-15 cm diameter breast height may be pollarded. Beech and ash will be preferred whilst oak may be pollarded around the edge of lawns;
- targeted control of deer and grey squirrels under Forest-wide programmes;
- no fallen trees, limbs or branches, will be removed from pasture woodland on the Open Forest (or within the identified Statutory Inclosures), except where:

a. *Occupiers of dwellings within the Perambulation and built before 1815, when Forest rights were registered, may exercise the privilege of collecting and removing deadwood from the Forest by hand only, for the sole purpose of*

burning it as fuel in their dwellings. No cutting tools may be employed in the removal and no limbs or branches greater than 15 cm in diameter may be removed.

b. *trees are deemed dangerous, in which case they may be treated according to the guidance below.*

c. *the crowns of fallen trees are recognised as a hazard to stock. These will be made safe and the material left in situ.*

d. *access is required for stock droving along major tracks and to prevent diversions around blockages which would lead to the development of new tracks.*

e. *sales of fuel-wood arise from approved programmes for removal of exotics or lopping, pollarding or coppicing.*

f. *sales of fuel-wood arise from 'unrestricted woods' under the regulation of the Forestry Commission.* (The sustainability of this practice for the unrestricted woods identified as being appropriate for this policy in Peterken, Spencer & Field (1999), will be tested through Condition Assessment and validation monitoring).

Management of veteran trees for safety

Native veteran trees (including old-growth holly and hawthorn) and the products which they shed on ageing (leaf litter, twigs, branches, boughs and eventually fallen boles or whole trees) should remain untouched and the crucial natural processes of nutrient recycling through decay and decomposition be allowed to pursue their natural course.

The only justifiable exception to this policy is where veteran trees present a significant danger to the public or property. The focus of this exception will inevitably lie where concentrations of the public and (primarily) their vehicles are placed in close proximity to a veteran tree resource, eg in and around camp sites and car parks.

All land owners have a duty of care to visitors on their land, and to take reasonable measures to protect them from foreseeable hazards. Many within the SAC will have internal policies and detailed management practices for discharging these responsibilities. However the following general principles should be adopted to ensure that over-enthusiastic and unnecessary remedial treatments do not endanger the supply of veteran trees and the dead standing and fallen wood habitats which they provide:

- The condition of veteran trees in locations where they might present a serious danger to the public should be monitored on a regular basis.

- Consider what steps could be taken to remove the concentration of public from the veteran tree resource, eg closure and relocation of car parks and camp sites, diversion of foot paths etc.

- Where treatment of a veteran tree has been justified (on the basis of detailed examination of biological and structural parameters) and the public cannot realistically be removed from its sphere of influence, then the principle of doing the absolute minimum treatment required to restore the tree to a reasonably safe condition must be followed.

Every effort must be made to retain as much of the veteran tree in an upright condition for as long as possible.

- A sustainable remedy is minimal tree surgery where dangerous limbs are removed leaving as much of the crown as possible, but ensuring that the tree remains balanced and secure against the wind. Severe pollarding (removal of the crown) of a veteran (which in the Forest will not have been purposely pollarded this century) may well kill the tree - almost certainly so in the case of beech. It is essential to leave at least some live branches to maintain the life functions of the tree whilst it produces new branches. All efforts to avoid undue compaction of the soil around the base of the tree should be taken.

There can be very few cases where there is any justification for felling the bole having removed the crown. A hollow standing trunk is normally a very stable feature, and provides a rich resource and different suite of niches and environmental conditions to a felled tree. It also lasts a lot longer.

- All material removed from a treated tree should remain in close proximity to that tree. Only where there is a serious risk of such material proving a hazard in sites of high public pressure, should further treatments be considered. Ideally it should be pulled back into the nearest woodland and left to decay, and only as a last resort should it be cut up and removed or burnt.

3.4.2B Restoring units to favourable condition

Management Policy: ***Where the objective is to restore units to favourable condition, then additional management operations may be required in the short term, conforming to the generic prescriptions below.***

Management Prescriptions: Implementation of the positive management policy for restoring units to favourable condition requires:

a. Promotion of regeneration

Where units are in unfavourable condition through a lack of tree regeneration and this is unlikely to occur naturally in the foreseeable future, then intervention may be

considered through treatments firstly within a grazed situation, and secondly using fencing or sowing in an ungrazed situation:

'Grazed Regeneration'

i. Protection of naturally regenerated seedlings or pockets of natural regeneration with tree shelters, or substantial dead hedging formed from durable oak branchwood or the use of holly or hawthorn brash.

ii. Sowing of tree seed of local provenance in natural shelter (dead wood, or scrub) maintaining open grazing.

'Ungrazed Regeneration':

i. Temporary exclusion of grazing animals through provision of temporary fencing and tree shelters, maintained until satisfactory establishment following natural regeneration is maintained.

ii. Sowing of locally collected seed and its subsequent protection as above. This will be most effectively achieved after a good mast year when seed will be abundant. Initial localised ground preparation may be appropriate, and an annual maintenance programme will be required until the trees have become established. Fences must be properly maintained until their removal at the end of 15 years or whenever the trees are no longer at risk from damage by domestic animals or deer.

iii. Direct planting and protection of young trees of local provenance. This will be a last resort and will require the use of New Forest stock grown on in a tree nursery.

The priority is to encourage natural regeneration through the application of appropriate protective measures, over sowing or planting, whilst maintaining necessary grazing. This is to achieve a natural composition and genetic constitution which can be compromised by planting, and remove the necessity for post-regeneration treatments to remove excess regeneration and avoid the mistakes apparent from the 1950's 'regeneration plantations' referred to earlier.

On sites where bracken cover is a significant factor in preventing natural regeneration, then localised treatments may be appropriate. Suitable treatments include spraying with Asulox, repeated mechanical cutting and/ or rolling, and treatment by enclosing pigs for a limited period within a temporary fence. However, it should be noted that pony grazed bracken stands are important centres of tree regeneration; it is only where bracken is particularly dense that regeneration is inhibited. The grazing option should be considered first in all cases.

b. Treatment of emergent woodland

It is important that the ecological dynamics of natural woodland extension and retraction over time is maintained, within the constraints of needing to maintain primary heathland habitats in favourable condition. Due to the ecological complexity and degree of judgement required to plan sensitive emergent woodland management it is essential that individual plans are compiled by a qualified ecologist prior to any works taking place.

In principle three treatments are likely to be required depending on the situation:

i. Where adjoining habitats (wet grassland, mire and heath) are in unfavourable condition due to the spread of dense birch and scrub from emergent woodland then removal sufficient to restore the habitat in question to favourable condition is necessary.

ii. Transitions which are not threatening these primary habitats (eg over bracken) should not be cleared and the birch will be retained to biological maturity, especially in those areas where the development of young woodland of oak, beech and birch is desired. There is no merit in clear-felling such transitions but consideration should be given to managing the emergent woodland to hasten an appropriate structure (eg pollarding or thinning) to avoid a rather dull closed canopy woodland edge.

iii. Early 20th century dense, young canopy woodland which has spread over former or relic primary habitat, eg wet and dry grassland, and where this primary interest is recoverable, should be removed and the primary habitat restored.

c. Removal of non-native tree and shrub species

Where units are in unfavourable condition due to the presence of unacceptable levels of non-native trees and shrubs, then intervention is required through their systematic removal to a level not exceeding 1% cover per unit of pasture woodland. In all cases excessive mechanical disturbance to the wood pasture unit must be minimised, and this should be the primary consideration in deciding which management technique to use.

Rhododendron ponticum: Complete removal from the whole SAC will be attempted. For areas accessible to mechanical harvesting, then bushes can be dug out and either mulched in situ or transported off site for burning. Regrowth should be treated with an appropriate herbicide (eg Roundup) or further mechanical intervention in the following two years. Where ground conditions are unsuitable for machinery access, bushes should be cut by hand to ground level followed by stump treatment with herbicide. It is acceptable to burn up on the site of former dense *Rhododendron* cover. Any initial changes in vegetation due to nutrient release will be restored by grazing.

Gaultheria shallon: Complete removal from the whole SAC will be attempted. An eradication trial using enclosed pigs was made in 1998 at Fletchers Hill, the results of which indicate that whilst the pigs do not eat the *Gaultheria* they do grub out the

roots and expose it to the air. It is as yet too early to assess whether this is an effective control method. It is likely that effective control will require further treatments with herbicides, or mechanical techniques such as turf stripping.

Sycamore: Complete removal from the whole SAC will be attempted. Trees should be harvested where feasible and the stumps treated with systemic herbicide to prevent re-growth.
Turkey Oak: Complete removal from the whole SAC will be attempted. Trees should be harvested where feasible and the stumps treated with systemic herbicide to prevent re-growth. Isolated trees can be felled and left in situ (as deadwood resource), younger stems can be ring barked and retained as deadwood habitat.

Sweet Chestnut: The larger stems of sweet chestnut will be tolerated where they form part of a valued historic planting or important landscape or recreational feature, except where they threaten to shade out native species, eg at Woosons Hill / Mark Ash where maturing regeneration is over-topping oak and its high tendency to windblow threatens sensitive old beech. Smaller stems will be removed to contain their spread into surrounding woodland. Re-growth of cut Sweet Chestnut will require treatment with systemic herbicide.

Red Oak: The larger trees will be tolerated, except where they threaten to shade out native species. Smaller stems will be removed to contain their spread into surrounding woodland. Red Oak forms an important part of several ornamental plantings at Denny, at Fancy Piece and within Matley Wood. In these areas the smaller self sown stems will be removed whilst retaining the original plantings.

Hornbeam: No action required as this species is considered a native species which is expanding its natural range.

Scots pine: Scots pine will be removed except where they provide shelter to groves of ancient trees, where they form important landscape features (as either small stands or single specimens), or where their removal would be damaging to surrounding woodland structure and soils. In these cases other methods of control such as ring barking or felling without extraction should be considered.

Other conifer and other species: Systematic removal wherever they are found, (eg poplars, non-native maples etc)

d. Former wood pasture requiring intervention

i. Within the Crown lands: Where units are in unfavourable condition through a lack of grazing as a result of entrapment within forestry Inclosures then wherever possible there should be a presumption in favour of restoring grazing management.

ii. Outside the Crown lands: In former pasture woodlands with surviving relic pasture woodland features (eg. old trees, rich lichen and saproxylic invertebrate features), then there should be a presumption in favour of

restoring grazing by domestic stock. However, this can and should be controlled to provide grazing levels which differ from those of the Open Forest to provide an important scientific contrast.

e. Recreational disturbance

Where units are in unfavourable condition through excessive levels of recreational disturbance then appropriate restoration measures will be carefully evaluated and implemented. Such measures are likely to include:

- The closing and/or relocation of camp sites, followed by pasture woodland habitat restoration.

- The closing, redesign or relocation of car parks, followed by pasture woodland habitat restoration.

- The repair and restoration of eroded footpaths.

- Priority sites for action during the 20 year span of this management plan are indicated on the tables below. It is appreciated that restorations involving major camp site closures and re-siting and car park re-structuring will generate highly complex issues, requiring considerable research, evaluation and resources, (both financial and in terms of provision of alternative locations where intensive forms of recreation are sustainable). Such proposals will require extensive consultation, and formal compliance with local authority procedures and the Habitats Regulations and will be the subject of individual detailed plans beyond the scope of this Management Plan.

The following table lists the locations of camp sites in or adjacent to pasture woodlands. A summary of their impact and their contribution to unit condition is given together with a prioritised recommendation for action.

Camp Site	Location	Impact	Condition Assessment	Recommendation	Priority
Denny Wood	In pasture woodland	Severe reduction in old trees/ dead wood/ lichens & ground flora	Unfavourable declining	Relocate camp site / Restore pasture woodland	High
Hollands Wood	In pasture woodland	Severe reduction in old trees/ dead wood/ lichens & ground flora	Unfavourable declining	Relocate camp site / Restore pasture woodland	High
Longbeech	In pasture woodland	Severe reduction in old trees/ dead wood/ lichens & ground flora	Unfavourable declining	Relocate camp site / Restore pasture woodland	High
Ashurst	In pasture woodland	Severe reduction in old trees/ dead wood/ lichens & ground flora	Unfavourable maintained	Redesign infrastructure to maintain existing features & prevent	Low

				further degradation.	
Holmsley	Adjacent to pasture woodland	Minimal	Favourable	None	Zero
Matley Wood	Adjacent to pasture woodland	Minimal	Favourable	None	Zero
Ocknell	Adjacent to pasture woodland	Minimal	Favourable	None	Zero

3.5 New Forest riverine woodland and bog woodland: issues, generic prescriptions and rationale specific to riverine and bog woodland in addition to those relevant under pasture woodland

Introduction

In addition to the issues discussed under Pasture Woodland (section 3.4.1), there are further issues which have the potential to significantly affect the condition of riverine woodland and bog woodland habitats, and for which additional generic guidance is required.

Overarching policy

Riverine woodland and bog woodland habitats are subject to the same overarching policy as that for pasture woodland identified under section 3.4

3.5.1 Additional issues affecting riverine woodland and bog woodland habitats

Significant issues additional to those identified under section 3.4.1 above, affecting or having the potential to affect the condition of Riverine Woodland and Bog Woodland habitats are listed in the following table, and are discussed below.

Issues pertaining to management required to maintain favourable condition		**Issues pertaining to management required to restore favourable condition**
Open space & shading: Coppice of alder & sallow.		Trapped pre-Inclosure riverine woodland and bog woodland.
		Drainage & soil disturbance
		Over-deepening of watercourses and loss of key habitat features.
		Recreation: Car parks / riverside walks Bankside erosion

Issue 1. Coppice of alder / sallow stands in riverine woodland

It is apparent from the most cursory examination that many if not most stands of riverine woodland were coppiced to some degree in the relatively recent past. Such a practice produced valuable fuel wood and construction material and promoted ecological diversity as the light conditions changed over the phases of coppice re-growth. Much of this former coppice is now closed canopy and some is derelict.

Whilst extensive coppice rotations within riverine woodland stands are unlikely to be acceptable today, there is a case for selecting some stands for re-instating a coppice rotation. Of particular relevance here may be the stands of riverine woodland currently trapped within Inclosures and which are likely to remain so in the long-term. In the absence of domestic grazing pressure, and provided deer

numbers are not excessive highly diverse fen communities could develop within the cycle of open and closed canopy coppice rotation.

Issue 2. Trapped pre-Inclosure riverine woodland and bog woodland

These are stands of alder and ash woodland which prior to enclosure would have bordered New Forest streams in a rich mosaic of wooded and non-wooded habitats. Enclosure and subsequent forestry activities resulted in significant degradation of these habitats particularly as a result of drainage, over-deepening of adjacent streams, planting of non-native forestry crops, often right up to the banks of the streams, and loss of Open Forest grazing. Where significant remnants exist within Inclosures, the management objective is to restore both the riverine and bog woodland elements and the accompanying fluvial processes of the adjacent stream. (See Issue 3).

Issue 3. Over-deepening of watercourses; loss of flooding regime and natural features debris dams

Riverine woodland, a priority habitat in the Habitats Directive, is defined by its topographical position and hydrology (see Part 1). There are few examples within the New Forest where the hydrology has not been modified by drainage and modifications to river or stream channels and their natural features.

Such modifications are most notable within Inclosures where stands of remnant riverine woodland are perched high above the over-deepened main channel and isolated from essential periodic inundation. Accompanying natural features such as riffles and ponds are much reduced or absent in a canalised channel and the former meanders and braided channels are often no more than isolated dry depressions. Whilst such degraded examples (eg within Highland Water Inclosure) are the extreme, even in the Open Forest the effects of upstream channel deepening, and the resultant erosional force of flood waters no longer controlled by the naturally functioning system, has resulted in over-deepened streams and perched stands of riverine woodland. In addition to this, the practice of excessive removal of naturally forming debris dams, contributes to the unfavourable condition of many stands and effectively prevents the development of a natural restoration process.

The maintenance of, or restoration to, favourable condition for riverine woodland requires that the full expression of fluvial processes be allowed to function within a physically, hydrologically and geomorphologically intact natural or near natural system. Periodic inundation of the riverine woodland stands with their accompanying features (braided channels, meanders, etc) is essential and in many cases this can only be achieved by raising water levels within over deepened stream beds. This can be achieved by a combination of expert engineering interventions in the case of seriously degraded systems, and by the more natural process of allowing the accumulation of naturally forming debris dams.

Debris Dams

Woody debris is generated along wooded catchments from tree death, limb shedding, windthrow and so on and may form debris dams if large pieces fall across the channel and become wedged, forming an obstruction against which other woody debris can accumulate, eventually impacting upon the rate and direction of stream flow. Riverine woodland in the New Forest is one of the few places where this natural process still functions along the various catchments.

An excellent review of the effects of woody debris on stream processes, flora and fauna is given in Everett *et al* (1997). Evidence is presented which demonstrates the value of such material in enhancing channel stability, ameliorating flood peaks, retaining sediment and organic matter and in promoting diversity of physical habitat in the stream. In the New Forest debris dams play an important role in enabling seasonal inundation of riverine woodlands (and other wetland habitats), particularly where previous drainage operations and channelisation works prevent this vital process from occurring over significant stretches. In addition they provide important habitats for a wealth of invertebrates, shelter from predators and important cover for fish, and create a diverse physical structure within the stream channel promoting pool and riffle formation.

Debris dams have often been regarded as a threat to fishing interests, commercial forestry including harvesting of fallen wood, animal welfare and a contributor to localised flooding of roads and property. Management has been a rather indiscriminate removal of woody debris wherever found with little regard to the ecological, or hydrological impact. It is clearly too vital an issue to continue to be treated in this fashion.

Issue 4. Recreation and bankside erosion. Potential for restoration

Riverine woodland is an highly attractive habitat for the general public particularly those with young families. Consequently, where car parks are located in close proximity to stretches of riverine woodland, considerable recreational pressure is exerted locally. This pressure manifests itself in eroded banks, excessive bare ground and impoverished vegetation, though elements of the undisturbed vegetation normally survive even in the most heavily used locations. In addition there must be some disturbance to wildlife, at least locally along these disturbed stretches.

There is a requirement to minimise such disturbance by managing the way people reach these sensitive locations. One option would appear to be closure or reduction in capacity of certain car parks, though this in itself may lead to further problems elsewhere and may not necessarily reduce pressure overall. However, car parks of particular concern are those located at Balmer Lawn, Ipley Wood, Ober Corner, Puttles Bridge, Wooton Bridge and Millerford Bridge. The Forestry Commission has already halved the capacity of the car parks at Balmer Lawn and Ivy Wood, Ipley will be closed during the LIFE 2 programme and they will continue to review whether further reduction would be beneficial.

3.5.2 Generic management policies & rationale for riverine and bog woodland

Note that these are additional to the generic prescriptions applying to pasture woodland eg non-native tree and shrub species under 3.4.2.

3.5.2A For maintaining riverine and bog woodland units in favourable condition

Overarching Management Policy: ***Where the objective is to maintain the unit in favourable condition, then the favoured management option will be one of minimal intervention implemented through a limited series of maintenance operations conforming to the generic prescriptions below.***

Management Prescriptions: The agreed policy for riverine woodland is that it should be maintained as naturally as possible. This requires that streams and rivers be allowed to flood, their channels be allowed to migrate according to the natural dictates of erosion and deposition and dead wood should be allowed to accumulate and disperse naturally in the channels. Hence the implementation of the minimum intervention policy requires:

- retention of natural or near natural physical, geomorphological and hydrological regimes;

- retention of debris dams except where there is a demonstrable risk to the health and safety of humans, commoners stock or roads and property;

Where management is required to avoid such risks, then an appropriate evaluation and options appraisal should be conducted to determine the degree of intervention required. This may result in minor adjustments, partial removal or even complete removal of debris dams in exceptional cases.

- Consideration may be given to re-coppicing of old alder or willow coppice stands particularly where this will result in the restoration of rich fen communities. It is recognised that such activities will take place largely where stands of riverine woodland will remain within Inclosures.

- Maintenance of Open Forest commoners grazing where possible.

3.5.2B For restoring units to favourable condition

Overarching Management Policy: ***Where the objective is to restore units to favourable condition, then additional management operations may be required in the short term, conforming to the generic prescriptions below.***

Management Prescriptions: Implementation of the positive management policy for restoring units to favourable condition requires:

a. Where habitats are in unfavourable condition as a result of over-deepening of watercourses; loss of flooding regime and natural features

The management objective is to allow full expression of fluvial processes within a wooded environment by restoration of a more natural physical, geomorphological and hydrological regime. This is likely to require, subject to appropriate considerations of health and safety, animal welfare and road and property damage:

- removal and / or reinstatement of artificial land forms (eg spoil banks) which prevent seasonal inundation;

- raising of stream bed levels where over-deepened, by appropriate measures (eg. reinstatement of bed levels using adjacent spoil or construction of strategically placed debris dams);

- restoration of former braided channels and meanders;

- where practicable and desirable the reinstatement of commoners grazing.

In all cases detailed restoration plans will be required to be drawn up by suitably qualified experts in full consultation and agreement with the Environment Agency (and other interested parties).

b. Where habitats are in unfavourable condition as a result of recreational activities

Where units are in unfavourable condition through excessive levels of recreational disturbance then appropriate restoration measures will be carefully evaluated and implemented. Such measures are likely to include:

- Repair and restoration of eroded habitats subject to:

  _ Application of repairs to eroded surfaces should only be applied where further damage to nature conservation interests will not occur as a result of the repair works.

  _ The emphasis should be on natural regeneration of vegetation cover rather than import and spread of additional materials.

  _ There should be a presumption against the building of new permanent paths using imported gravels, though it is recognised that in certain locations such measures may be appropriate.

  _ Programmes to restore 'eroded' habitats should be subject to detailed planning and evaluation.

Where such measures are insufficient to restore habitats to favourable condition, then alternatives such as the closing, redesign or relocation of adjacent car parks, followed by habitat restoration, will need to be considered.

3.6 New Forest heathland communities: wet heath, dry heath, mire, dry grassland, wet grassland, permanent & temporary ponds: issues, generic prescriptions & rationale

Introduction

This section discusses the issues affecting the condition of New Forest heathland habitats, comprising dry heath, wet heath, mire, dry and wet grassland, permanent and temporary ponds, and sets out the generic management guidance and rationale required both to maintain those units currently in favourable condition, and to restore those units currently in unfavourable condition.

Overarching Policy

A number of issues may affect the condition of these heathland habitats; the choice of management prescriptions to address these issues depends on the severity of their impact on unit condition. The following overarching management policy is derived from the nature conservation objectives for dry heath, wet heath, mire, dry grassland, wet grassland, temporary and permanent ponds:

Where the objective is to maintain the unit in favourable condition, then the favoured management option will be one of continued extensive management, through a series of rotational maintenance operations conforming to the policies and prescriptions under 3.6.2A below.

Where the objective is to restore units to favourable condition, then additional management operations may be required in the short-medium term, conforming to the policies and prescriptions under 3.6.2B below.

3.6.1 Issues affecting heathland habitats

Significant issues affecting or having the potential to affect the condition of heathland habitats are listed in the following table, and are discussed below.

Issues pertaining to management required to maintain favourable condition		**Issues pertaining to management required to restore favourable condition**
Grazing & conservation management for New Forest heathland habitats. Commoners stock, deer & rabbits Trends in stocking levels Stock feeding		Over & under-grazing Stock feeding Stock pesticide treatments
Vegetation management through burning & cutting: Gorse, Bracken, Birch & Heather management		Non-native tree & shrub management Gorse, Bracken, Birch & Heather

Marketing of New Forest products		management
Turf cutting		Drainage and wet heath & mire restoration
Heathland habitats & scrub management		Heathland habitats & scrub management
Bare ground.		Recreation: Car parks Erosion: horse riding & cycling Disturbance: dog walking

Issue 1. Grazing and heathland conservation management; how the differential impacts of the principle grazing animals maintain the habitat mosaic; trends in numbers of commoners stock; issues of over and under-grazing. Active and potential management measures to address current or potential issues.

Grazing & Heathland Conservation: Over most of its range, with the exception of exposed coastal transitions where scrub and tree growth is suppressed, heathland is a complex of community types which left to themselves would eventually become woodland in one form or another. Consequently, the maintenance of species-rich heathland communities in the form and condition we have in the Forest today requires continual management intervention by man and his domestic animals. The component communities, their origins and development are described in Part 1. Here we are concerned with the impacts of depasturing animals on the Forest heathland communities and the issues arising from such a practice.

It is apparent that the Forest heathland communities are not all subject to the same grazing pressure. The reasons for this are given below, but the outcome is a diverse set of habitats not only adapted to withstand the effects of defoliation and fluctuations in herbivore population numbers, but dependent upon it to retain the special interest associated with each. (It should be noted that not all land within the cSAC is subject to commoner grazing rights. Private land may or may not be grazed depending on the wishes and circumstances of the owner).

Removal or a significant long term reduction in grazing pressure would cause rapid changes in the plant and animal communities comprising the Forest heathlands. The overall impact would be a rapid expansion to dominance of the more aggressive and competitive species (eg *Molinia* and scrub) at the expense of the less competitive species, and a dramatic impoverishment of the Forest flora and fauna adapted to the long tradition of Open Forest grazing management (see Byfield & Pearman 1992 for an evaluation of how a lack of appropriate management has caused adverse changes in the distribution of Dorset's rare heathland species). From a nature conservation perspective this would particularly impact on those features of special interest for which the Forest is designated and would therefore be catastrophic and unacceptable.

In the context of the New Forest (as opposed to un-grazed or lightly grazed heathland communities elsewhere) Table 3.6.1.1 shows the level of grazing required to maintain the habitat in favourable condition and what the likely impacts of under or over grazing would be. It demonstrates that the Forest heathland communities and the species which they support, are dependent upon a range of, and fluctuations in, grazing pressures . The next section describes how the extensive New Forest grazing system, maintains this variation resulting in the mosaic of communities apparent today.

Table 3.6.1.1 Intensity of grazing required to maintain favourable condition; likely impacts of under or over-grazing

Dry grassland		Impoverished flora in rank, species-poor sward with dense litter layer, dominated by coarse grasses; expanding scrub canopy	Physical destruction of sward, compacted bare ground, nutrient enrichment from excess dunging and supplementary feed
i. Parched acid	High	Loss of specialist floras (eg *Filago minima, Moenchia erecta, Sagina subulata*), and bare ground invertebrates, loss of woodlark	Removal of ground layer, disturbance too high for woodlark
ii. Heathy acid	Medium - high	Dominance of *Molinia* and *Agrostis curtisii*, impoverished flora and loss of woodlark	Removal of ground layer, disturbance too high for woodlark
iii. Moist acid	Medium	Rank swards, loss of woodland glades, impoverished invertebrate fauna, loss of fungi flora	Physical destruction of sward
iv. Neutral green	High	Impoverished flora, loss of *Chamaemelum nobile*	Physical destruction of sward
v. Herb-rich bracken	Medium	Impoverished flora and fauna, increased density of bracken	Physical destruction of sward
Wet grassland	Medium to high	Loss of species-rich sward top scrub and *Molinia*	Removal of ground layer, poached bare ground
Wet heath	Medium to high	Expansion of *Molinia*, tussocky structure with dense litter layer and impoverished flora. Spread of *Myrica gale*. Loss of *C. mercuriale*	Physical destruction of community, loss of *Sphagnum*, nutrient enrichment
Dry heath	Low - Medium-high	Reduced structural diversity, loss of bare ground, loss of woodlark, loss of prostrate lichen-rich heath	Removal of ericaceous component, replaced by nutrient enriched and impoverished grass dominated community. Loss of Dartford warbler.
Mire	Medium to high	Impoverished fauna and flora, increased dominance of *Molinia*, loss of *Coenagrion mercuriale*	Physical destruction of community, loss of *Sphagnum*, nutrient enrichment
Temporary ponds	Medium to high	Rank grassy swards nd loss to scrub invasion. Loss of specialist flora, eg *Litorell uniflora, Pilularia globulifera, Cicendia filiformis, Illecebrum verticillatum* etc	Physical destruction of community through poaching and nutrient enrichment

How the differential impacts of the principle grazing animals maintain the habitat mosaic

There is a wealth of literature on the impacts of grazing on New Forest vegetation. Of particular relevance to the New Forest are works by Putman (1986), Ekins (1989), Gill (1987), Tubbs (1986), and the Nature Conservancy Council (1983), which focus on the grazing animals, and Clarke (1988) and Sanderson (1995 & 1996) which look at the effects of grazing on heathland vegetation dynamics and diversity from a botanical perspective.

It is appropriate here to discuss in further detail the impacts of the primary grazing animals (ponies, cattle and deer) on New Forest heathland habitats, and for managers to be able to recognise when the regime is achieving the nature conservation objectives, or when through under or over-grazing adjustments may be necessary to maintain or to restore favourable condition. *(Options currently or potentially available to manipulate stocking regimes to address problems arising from inappropriate stocking are presented in the generic prescriptions section).*

There are some key points which are highly relevant to this Management Plan which arise from the accumulated literature referred to above. These points are derived from the analysis of the differential social, physiological and foraging behaviour of the key grazing animals and their differential impacts on the New Forest vegetation. They are summarised in Table 3.6.1.2

Key Implications

- Virtually all New Forest heathland habitats require grazing management to maintain the features for which the site is designated. It is without question the most appropriate principle management tool for the Open Forest vegetation. Illingworth (1991) demonstrated that the commoning system is the only really viable way (in terms of cost, and physical effort) to effectively graze the Forest habitats which are subject to common rights. There is no evidence to suggest that this analysis does not hold today.

  (Provision of extensive grazing on the fragmented enclosed lands within private ownership is an issue dealt with on an individual basis with English Nature and the respective owner / occupier. The issues relating to a lack of grazing on heathland habitats are the same).

- Ponies, cattle and deer have a differential impact on the various habitats, related to differences in their social behaviour, physiology and foraging behaviour. (See Table 3.6.1.2)

- Hence the Forest habitats are not subject to uniform grazing pressure; they are *preferentially* and *differentially* grazed, and consequently provide a range of niches for organisms adapted to such an extensive grazing management system. For example woodlark require a high grazing pressure

creating an intimate mosaic of bare ground and short vegetation. They do exceedingly well on the heavily grazed swards at the Bramshaw Commons where the prostrate heath produced by heavy grazing is exceptionally rich in lichens and bryophytes due to abundant light and low incidence of fire. Dartford warbler on the other hand are abundant in more lightly grazed gorse and heather mosaics.

Table 3.6.1.2 Differential social, physiological & foraging behaviour & impact on vegetation.

KEY FACTOR	ELEMENTS	IMPLICATIONS TO HABITATS
1. Social Organisation & Behaviour	Cattle: Herding animal which moves considerable distances to get the 4 basic necessities of food, water, shelter & shade. Tolerant of human disturbance. Natural patterns disrupted by supplementary feeding. Unlikely cattle could survive winter without supplementary feed. Do not segregate feeding and dunging	The more homogenous the home range the larger it needs to be to accommodate all 4 requirements, and the greater the distance cattle will need to travel to satisfy the requirements. Feed openly on suitable habitats. Focuses cattle activity (trampling, feeding & dunging) on small areas of habitat upon which supplementary feed is provided. Dung spread evenly over area of suitable grazing.
	Ponies: Matriarchal family group & small social units, with well defined home range the size of which depends upon availability of 4 basic necessities of food, water, shelter & shade. Rely on accumulated energy reserves & lowered winter food intake to get through winter Little movement between home ranges. Tolerant of human disturbance. Segregate feeding and dunging.	The more homogenous the home range the larger it needs to be to accommodate all 4 requirements. No supplementary feed implications. Grazing pressure greatest at the grazing focus where home ranges overlap and least at intermediate distances between such places. Feed openly on suitable habitats. Zone habitat into feeding and dunging area, translocating nutrients.
	Deer: Generally herding but varies throughout year. Intolerant of human disturbance. Rely on accumulated energy reserves & lowered winter food intake to get through winter	 Secretive & can only feed on open habitats when undisturbed. No supplementary feed implications.

	Do not segregate feeding & dunging	Dung spread evenly over area of suitable grazing.
2. Physiological Adaptation	Cattle: Ruminant adapted for bulk fermentation of grass which is the primary dietary item and which is utilised very efficiently. Large mouths, less prehensile lips than ponies, lack upper incisors and hence prefer to wrap their tongue round forage & tear it off rather than biting. Heavy animals with cloven hoofs ill reluctant to enter wetter habitats	Feeds preferentially on grass, for about 60% of the time, and does not need to feed at night. Concentrate activity in longer swards (.>5 cm) to feed effectively, but also rest ruminate and dung there as they do not have separate latrines. Restricted to dry heath and grassland; will not graze mires.
	Ponies: Non-ruminant requiring high food intake to compensate for less efficient digestive system. Have upper incisors & prehensile lips adapted to cutting off herbage close to the ground Hoofed, athletic animals which will feed up to belly depth in water.	Feeds preferentially on grass, for about 80% of the time all through the day and night. Concentrate activity in shorter swards (1-4 cm) away from latrine sites. Feed in mires and wet heath and ephemeral ponds
	Deer: Ruminant and efficient processors of food. Lack upper incisors, but small delicate muzzle permit more delicate feeding action .	Probably prefer longer swards around scrub and woodland edges offering some cover.
3. Foraging Behaviour	Cattle: Preferentially feed on grass with little seasonal flexibility other than *Calluna* in winter.	Grazing impact restricted to grassland and dry heath.
	Ponies: Preferentially feed on grass but varies diet to suit available forage, utilising bracken in September, *Molinia* and *Juncus* in wet heath and mire in late summer, tree leaves in Autumn and holly and gorse in winter. Feed in small groups and able to take advantage of small areas and linear areas	Grazing and browsing impact on all habitats. Even small suitable habitats grazed including linear stream side lawns and road verges.
	Deer: Fallow preferentially feed on grass but move to mast and browse (rose, bramble and heather) in winter. Roe are primarily browsing animals feeding on bramble,	Principle impact on woodland communities.

	rose and shrubs. Sika approx 30% grass : 40% heather & browse in Forest.	

- Cattle and ponies prefer the forage produced on parched acid grassland, moist acid grassland, neutral greens, and wet lawns over heathy acid grassland, dry heath, wet heath and mire. Indeed the animals will only move to less favoured habitats when forage on the favoured grasslands is exhausted. Ekins (1989) estimates that some 50% of all grazing is concentrated on these favoured grassland types comprising some 7% of the available Open Forest area, whilst some communities such as dry heath, sustain little grazing pressure.

- However, in dry summers when the grasslands parch out, mires and wet heath provide essential lush grazing. In addition, these habitats provide an early bite in late winter when rush growth precedes the onset of grass growth.

- Whilst cattle eat more *Calluna* than ponies they are reluctant to enter wetter habitats and have little impact on mires, other than round the periphery. New Forest ponies are capable of foraging *Molinia* in mires up to belly height without getting stuck. Neither cattle nor ponies will eat *Erica tetralix* or *E. cinerea.*

- Generally, ponies have a greater impact on the vegetation than do cattle. Few ponies move between home ranges, which are centred on a grass lawn. Hence grazing pressure is greatest at the grazing focus where ranges overlap and least at intermediate distances between such places.

Secondary Grazers

Other Commonable stock depastured on the Forest comprise sheep, pigs and donkeys.

Sheep grazing rights apply to a few holdings in the Beaulieu area but until the 1970s had not been exercised for many years and it is unlikely that sheep grazing was ever particularly widespread in the Forest. Consequently its impact has been fairly inconsequential, though it is worth stating here that a significant increase in sheep (however unlikely) on the Forest would have highly detrimental impacts on heathland habitats. Evidence of the impact of sheep grazing on heather cover is manifest in the heather denuded uplands with their chronic overstocking issues.

Pigs are turned out on the Forest under rights of mast to coincide with the autumn fall of acorns and beech mast. This practice is beneficial in removing a high proportion of the green acorns which can be fatal to stock when eaten in excess and is useful in providing suitable conditions for tree regeneration in the pasture woodlands. Regrettably few commoners exercise their rights of mast today.

Donkeys continue to be depastured on the Forest, though in increasingly small numbers as former markets (pack, harness and latterly as childrens seaside mounts at holiday resorts), die out. Their impact on heathland vegetation is purely local.

In addition to commoners stock, rabbits undoubtedly compete locally with ponies and cattle for forage, especially on lawns where their impact can be particularly noticeable. However, rabbit numbers fluctuate naturally, and keepers exert population control before impacts become significant in anything other than a localised context.

Trends in numbers of commoners stock de-pastured on the New Forest

Grazing regimes have varied over the centuries. Figures 3.6.1.1, 2 and 3 illustrate the fluctuating pattern from data available for the 20th century. Numbers are based upon the marking fee register and whilst presumably reflect the pattern of fluctuation probably under-represent absolute numbers. Numbers are invariably lowest in winter and highest in summer as a proportion of animals, particularly cattle, are traditionally wintered off the Forest.

NOTE: These figures do not show how many stock are present on the SAC at any one time. Commoners move their stock on and off the Forest for a variety of reasons throughout the year. They simply demonstrate an overall trend in animal numbers over time for which a marking fee has been received.

Whilst, in principle overall stocking densities could be calculated using these data, there are too many variables involved to justify such an analysis and in the context of the New Forest it would be virtually meaningless. There is no ecologically derived justification for the upper and lower stocking levels seen in the past, eg in terms of forage production per habitat and assessments of carrying capacity per habitat (or forage species type) per grazing animal, per season, as attempted by Putman (1986). The impact of weather conditions (eg warm wet summers vs hot dry summers) on grass growth is not considered.

All that can be usefully stated is that within the historical upper and lower stocking levels, experience shows that as far as grazing goes, the individual habitats are maintained in favourable condition. Above this level, demand for stock feeding increases, and Forest stock lose condition, below and it is probable that signs of under grazing and loss of those features for which the Forest is designated would be manifest.

It is neither possible nor ecologically desirable to set hard and fast targets for animal numbers de-pastured on Forest habitats over the year. The grazing animals are the principle tools with which to achieve the structure and composition of the various habitats whose favourable condition are defined in the Condition Assessment tables. Within these limits variation in animal numbers is highly advantageous in producing habitat variation which consequently favours one species over another in an ever varying sequence over time.

Figure 3.6.1.1

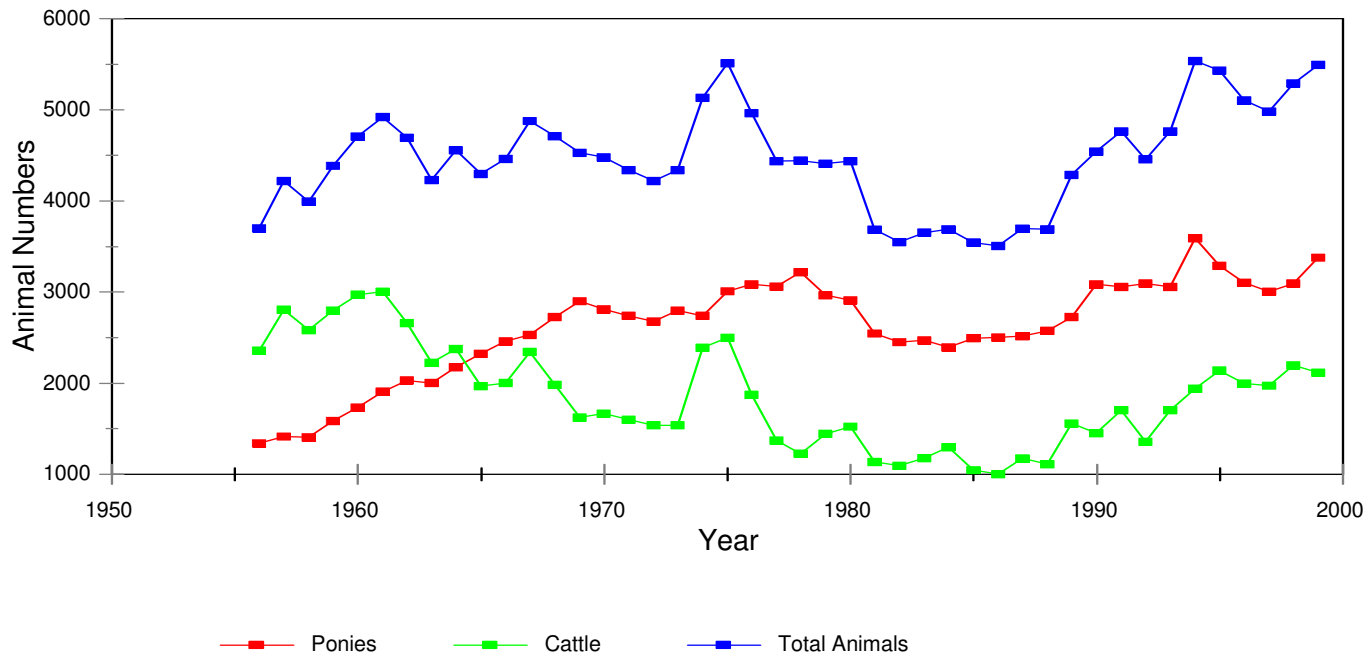

Crown lands Stock
Animal Numbers
6000
5000
4000
3000
2000
1000
1950
1960
1970
1980
1990
2000
Year
Ponies
Cattle
Total Animals

Figure 3.6.1.2

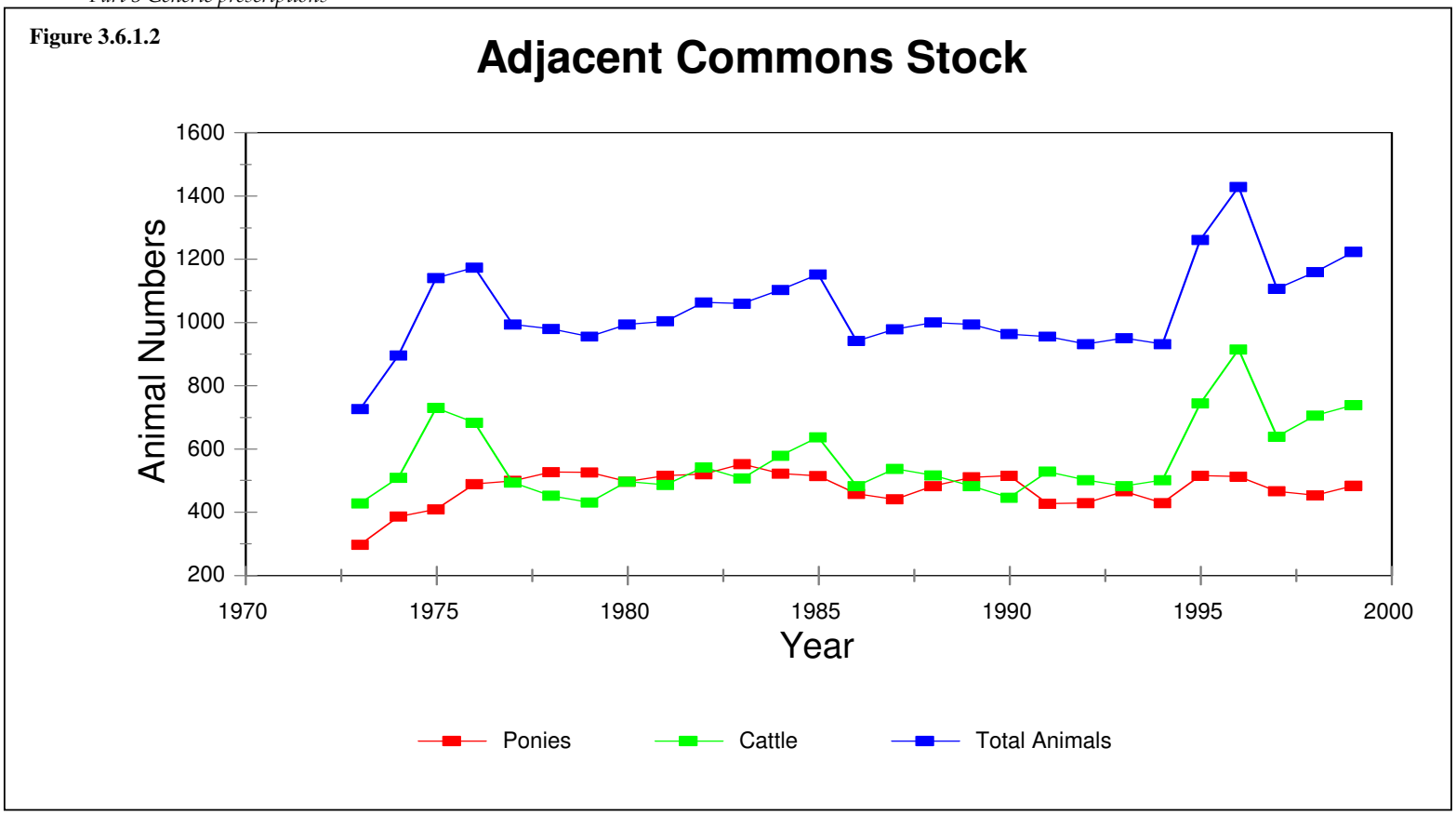
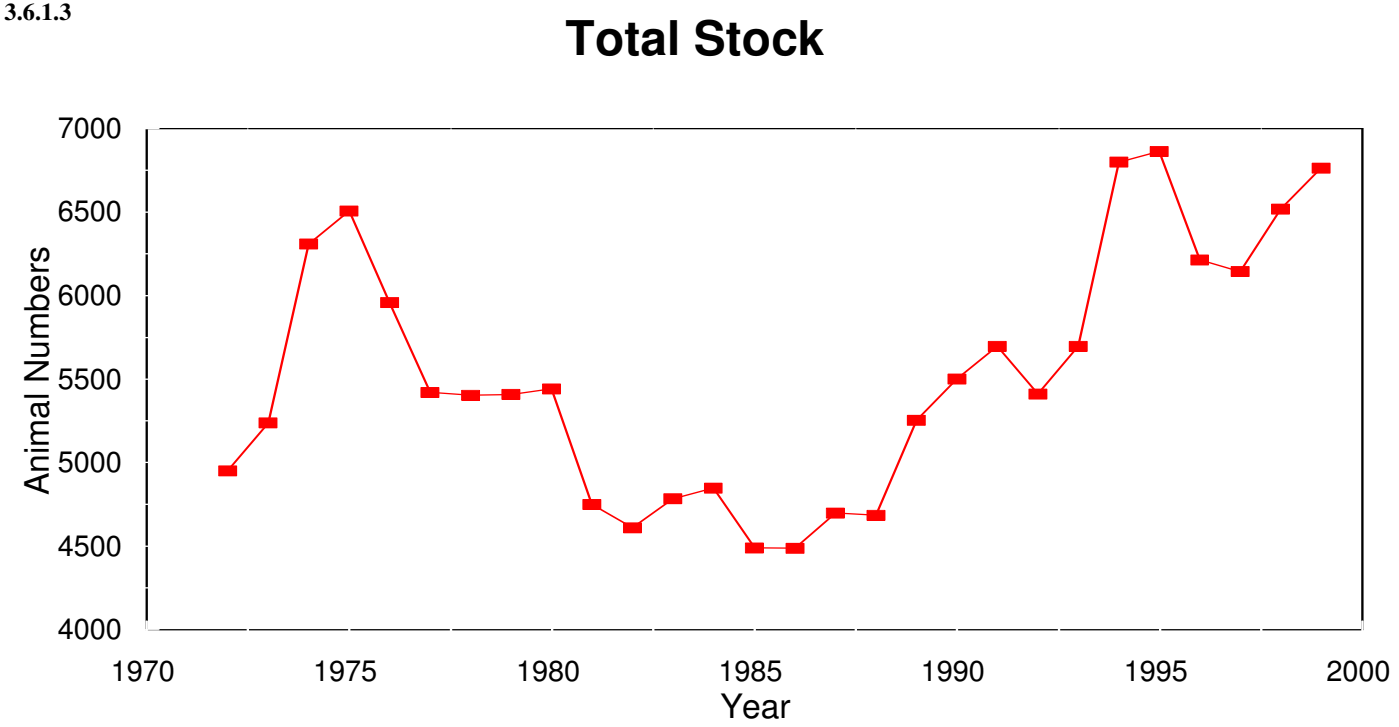

Adjacent Commons Stock
Animal Numbers
1600
1400
1200
1000
800
600
400
200
1970
1975
1980
1985
1990
1995
2000
Year
Ponies
Cattle
Total Animals

Figure 3.6.1.3


Total Stock
Animal Numbers
7000
6500
6000
5500
5000
4500
4000
1970
1975
1980
1985
1990
1995
2000
Year

Over-grazing and under-grazing: The extensive grazing regime, operating differentially over the year means that it is difficult to reach a point where stocking levels sustainable in the absence of supplementary feed, would cause significant damage to the various heathland communities. It is only when attempts to support stock in excess of the carrying capacity of the natural vegetation through the provision of supplementary feed, does damage begin to occur.

This implies that New Forest grazing levels can be maintained below the ecologically acceptable upper limits by existing or improved regulation of commoning practice, by the Verderers in conjunction with the commoners and land owners. An increase in stock numbers in excess of utilisable forage would result in the presence of animals in poor condition. Regulation by the Agisters (assisted by the RSPCA and the British Horse Society) should ensure that stock in declining condition are removed from the Forest before this occurs. It is only through artificial interventions which would raise the feeding capacity of the Forest habitats above their natural capacity that serious overgrazing resulting in severe damage to habitats would occur. These interventions include the extensive provision of artificial bulk feed, on or adjacent to the Open Forest, or attempts to improve the natural productivity of the Forest habitats with artificial fertilisers, ploughing or re-seeding. Such activities would be immediately damaging to the conservation interest and are contrary to the protective legislation.

Statements that the Forest is over-grazed, or under-grazed are commonplace depending upon the objectives (normally unstated) that the authority making the statement may have for the Forest. The management objectives in this Management Plan are designed to maintain (or restore) the various habitats in a defined condition which will enable the existing features for which the site is designated to thrive. Hence, judgements regarding grazing pressure must be made against the habitat attribute targets defined in the Conservation Objectives.

The grazing pressure to which the Forest is subject has created and maintained over the centuries a suite of habitats with a range of niches within them. Those species adapted to that management and those niches have thrived, those intolerant of high grazing pressure and ill adapted to the available niches have not thrived. As an illustration, the food plant of the Marsh Fritillary butterfly is Devil's-bit Scabious (*Succisa pratensis*), which is super abundant on wet grassland in the New Forest. However, whilst the larval food plant is not limiting, the grazing pressure does not allow the formation of other crucial habitat requirements (eg web and pupal refuge) for the butterfly to survive in the Forest. In this instance it would be correct to say that the Open Forest wet grassland is over-grazed if the management objective was aimed at Marsh Fritillary conservation. It is not. To create suitable conditions for this butterfly on the New Forest wet grasslands would require a massive decrease in pony and cattle grazing with the consequent knock-on effects on the commoning community in conjunction with considerable scrub invasion for shelter, and would result in a dramatic change in sward height and structure which would be totally incompatible for many of the Forests special interest features. The statement could then justifiably be made that the Forest was under-grazed for those species of

highest conservation importance, the nature conservation objectives are not being met and the conservation value is decreasing.

Some Forest habitats are subject to hard grazing (the wet and dry grasslands in particular). That is fine; they need hard grazing to maintain the interests features. However, it is possible to have too much of a good thing and cross the boundary from stocking levels consistent with hard grazing to levels which damage the fabric of the Forest habitats even for the suite of features for which the Forest is designated. At very high stocking levels, particularly where the maintenance of animals is associated with the provision of artificial feed, then signs of over-stocking begin to appear. In a minority of cases, the provision of supplementary feed has led to significant changes in heathland vegetation as a result of excessive poaching, trampling and nutrient enrichment. These are generally cases of too many animals of the wrong sort in the wrong place at the wrong time, issues which have to be addressed and managed.

Active and potential management measures to address issues resulting from inappropriate grazing pressure or stock management

Unlike other Common land elsewhere in the country, there are no absolute limits defining numbers of permissible stock associated with individual properties for the New Forest, although a limit could be set by the Verderers should they so chose. (The introduction of 'stints' in southern England is an artefact of the Commons Registration Act which the Forest was fortunate to avoid). It was formally a question of custom or more recently market forces which has driven stocking levels. Whilst in principle the requirement to maintain habitats in favourable condition should now be the key determining factor, in practice within certain limits, this is flexible over time. Within these limits the operation of market forces, or traditional commoning lifestyles will determine absolute numbers at any one time. Where issues relating to inappropriate stock management arise in the Forest there are a number of measures currently available, or others which could be explored to address the issue. These are discussed under *Management Prescriptions for Restoring Heathland Units to Favourable Condition*.

'Overgrazing' from the grazing animal perspective

The previous discussion dealt with over and under-grazing from the nature conservation perspective. However, it is also important to consider overgrazing from the grazing animals perspective. In the absence of artificial feed there is a limit on how many ponies or cattle can be accommodated on the New Forest without detriment to the animals themselves. The objective must be to maintain a sustainable herd of grazing animals of good quality to manage Forest habitats, that ultimately provide a viable income to commoners. The current situation is probably unsustainable. The Verderers should look at sustainability issues across the board and establish a ten year plan to incorporate such measures as may be required including provision of grazing back-up land, kite mark products (eg organic Forest

beef), schemes for headage payments under contract (eg animals must conform to certain desirable traits) etc.

Issue 2. Pesticide treatments

Treatment of commoners stock with certain chemical pesticides may have adverse impacts on many non-target invertebrate groups. Current use by the Verderers of a Pyratape wormer (Strongyd-P) may be benign. However whilst this is an effective equine wormer it does not affect bot fly infestations - a significant issue for New Forest ponies. Avermectins and closely related products would appear to be effective against both infestations but the former pose serious and well documented threats to invertebrates and the latter is as yet untested. Benzimadazoles are thought to have a negligible effect on dung fauna but it is not known how damaging such chemicals are to aquatic Crustacea and hence to populations of nationally scarce species such as Fairy Shrimp (*Chirocephalus diaphanus*) and Tadpole Shrimp (*Triops cancriformis).*

Commoners treat cattle themselves and may well use Avermectins, but this is largely carried out off the Forest. Sufficient time may therefore lapse for the toxicity of dung to reduce before the animals are brought back onto the Forest.

It is clearly an area for further research before any statements can be sensibly made about which treatments (if any) are acceptably benign to important invertebrate groups. A project should be initiated which:

- reviews current patterns of pesticide usage;
- reviews the toxicity profiles of current products in use in the Forest, and those for which there may be a likely demand in the future;
- determines the risk of exposure to dung and aquatic invertebrate communities;
- explores alternative management strategies to avoid contamination, and where avoidance is impractical ensures that only benign treatments are used on Forest stock.

Issue 3. Vegetation management through burning and cutting New Forest heathland habitats: impact, current practice and future

Whilst grazing is the principle tool for managing heathland habitats, it does require additional interventions to maintain favourable condition across the suite of habitats. For example, whilst cattle grazing exerts a measure of control over broadleaved tree species it is ineffectual against Scots pine. Without additional measures, including cutting and burning, Scots pine would quickly become dominant over large parts of the Forest habitats with consequent loss of nature conservation value and available grazing for commoners animals. Whilst moderate

to low grazing levels will prolong the heather building phase and delay the onset of maturity and degeneration, it cannot indefinitely prevent the heather from passing into the later stages of growth phases (Gimmingham 1992). Finally, whilst grazing animals make an important contribution to the management of bracken and gorse brakes, further interventions are required to exert control and maintain favourable condition.

i. Burning: History, effects on flora & fauna, current practice and key points

Whilst burning has probably been a feature of the Forest heathlands for millennia, there has been a demand from the commoning community to burn heathy vegetation since it was realised that it generally produces a temporary flush of palatable vegetation, particularly grasses (eg *Molinia)* over the rather less palatable dwarf shrub heathland plants. From the nature conservation perspective, the objective is to use burning as a complementary and subsidiary tool to grazing, to produce a varied mosaic of age and structure in the heather stands. Such a practice maximises niche diversity providing habitat for a wide range of plants and animals including those which are dependent upon a particular phase of the heather cycle, (eg Silver-studded blue butterfly). Thus, there are significant benefits to both the commoning community and nature conservation from the practice of controlled burning.

However, burning New Forest heathland is a controversial issue, which results annually in expressions of concern from the general public and from ecological commentators to English Nature, Forestry Commission and the Verderers, who see it as damaging to wildlife or particular genera. Heathland vegetation, when in a condition suitable for burning, may support a rich bird, reptile and invertebrate community, with high profile species such as Dartford warbler, smooth snake, and Sand lizard appearing to be particularly vulnerable. Such concern is of particular significance in the light of the recent trend in early springs when reptiles are emerging from hibernation in February, and Dartford warblers may start to nest during March.

It is important therefore to recognise the distinction between uncontrolled wild-fire covering potentially huge areas in an indiscriminate manner which create vast uniform and monotonous expanses of even-aged heather stands, and the controlled burns carried out by experts in the practice from the Forestry Commission. Whilst it is probable that fire has been used as a tool to manage heathland communities for centuries, there is no clear historical record prior to its formal controlled use by the Crown from around 1870. This was largely in response to the need to control invasive Scots pine (a recent introduction), and probably an attempt to replace unauthorised and potentially devastating wildfires with a properly managed burning regime.

Effects of burning on the flora and fauna

Generally, controlled burning promotes fresh growth of *Ulex europaeus, Molinia* and *Calluna*, removes the suppressive litter layer, checks tree invasion, and after an initial flush, depresses nutrient status (especially nitrogen and phosphorus). However, the precise response depends upon the community being burned and the grazing intensity of post-burn treatments. The driest stands, where *Molinia* is a rare component do not produce a grassy flush but remain substantially bare whilst first *Erica cinerea*, then *Calluna* gradually re-establish over 2 - 4 years. There is no commoning benefit therefore in burning such stands which also tend to support population centres of the more vulnerable heathland vertebrates (eg smooth snake and sand lizard). On the other hand there is merit for burning some drier stands which produce beneficial bare ground habitats for invertebrates and rich lichen communities prior to the heather canopy re-forming as the successional process continues.

Burning of more humid stands results in early dominance by *Molinia* for 1-3 years followed by re-establishment of first *Erica tetralix* and then *Calluna* in the presence of grazing. Controlled burning of wet heath and mire, particularly where very light grazing has led to an overgrown impoverished community with dense *Molinia* or *Myrica gale*, can be very beneficial.

Gorse stands require management to maintain them in a condition suitable for Dartford warblers and as an important browse and shelter for ponies. Regeneration from seed or the base (a form of coppice by fire) is generally good, the rate of re-establishment depending on the amount of suppressive post-fire grazing. However, very old degenerate gorse stands respond less well, perhaps as a result of burning at lower fire temperatures at ground level which fail to stimulate regeneration (Sanderson 1994) but also because old stems are unable to produce so many new shoots.

Burning favours species which have renewal buds in positions which escape the full impact of the fire (eg rhizomatous species such as bilberry, tormentil and bracken), or those that re-sprout from the stem base and are partially protected by the surface humus such as *Calluna*, *Erica cinerea, Ulex minor* and *Ulex europaeus,* or those with renewal buds located at ground level surrounded by layers of old leaf bases such as grasses, sedges and certain rosette species such as *Succisa pratensis* (Gimmingham 1992). It also favours lichens which are highly fire-adapted. Whilst they survive best with cool fires, where survival in the soil of spores or thallus fragments occur, they also re-colonise in about 10 years if the fire was hot. The well lit hard humus in canopy gaps can only be produced by hard grazing or fire.

Mobile animal species are able to avoid the burn, and since burning is not permitted outside the legally permitted period of 1 November - 31 March, then impact on ground nesting birds is not generally an issue, (though woodlark may nest in suitable sites in early March). *(Note that the burning period can be extended for a further two weeks into April subject to the approval of MAFF in consultation with English Nature).* Reptiles hibernating in burrows at the time may escape the effects of fire as litter and

soil layers provide excellent heat insulation and the rise in temperature only a few centimetres below the surface during a well-managed fire is minimal.

Current Practice: Since 1949 the Forestry Commission has carried out an annual programme of controlled burning, at first covering 800-1200 ha annually, but since 1965 the area has averaged 400 ha. Using the high degree of expertise developed over the years, Forestry Commission staff produce a cool burn which removes the standing vegetation but does not kill the more sensitive plants. March is often the time when conditions for burning are optimal as the soil is still moist yet the vegetation is dry enough for the fire to carry well. Plant growth is minimal and most animals are dormant either underground or in spots sheltered from the heat of the fire. The area burned is strictly confined to limit the fragmentation of animal populations. *(See Generic Prescriptions for detailed specification).*

Key Points concerning controlled burning of New Forest heathland habitats

Controlled Burning is an essential complement to the principle grazing management to:

- control invasive Scots pine (and other tree regeneration not controlled by grazing);
- create a mosaic of heathland vegetation structures of different ages to maximise niche separation in all heath types;
- regenerate ageing or degenerate heather and gorse brakes;
- reduce the risk of wild-fire which can be highly damaging due to high temperature burn and extent.

Properly managed controlled burning, with due regard to extent, timing, location, habitat condition, and species considerations, will not result in significant damage to sensitive plant or animal communities, though inevitably individuals may succumb, despite best practice.

Table 3.6.1.3: Comparison of the impacts of grazing, controlled burning and cutting.

Grazing	Controlled Burning	Cutting
Selective	Non-selective	Non-selective
Removes litter layer	Removes litter layer	Leaves litter layer
Decreases nutrients	Decreases nutrients	Can increase nutrients
Independent of weather	Weather dependent	Independent of weather
Does not control Scots pine	Controls Scots pine	Controls Scots pine though some may re-grow
Some impact on bracken	Does not impact on bracken vigour	Repeated cuts depress bracken vigour
Cattle and deer may delay birch regeneration and halt growth of saplings. Can kill seedlings	Coppices birch saplings	Coppices birch.
Promotes heterogeneity at all levels ie diversifies within and between stands, interrupts heather canopy and creates gaps	Promotes heterogeneity ie diversifies stand, interrupts heather canopy and creates gaps especially at the stand level and above.	Promotes heterogeneity ie diversifies stand, interrupts heather canopy and creates gaps
Unlikely to kill slow moving animals	Can be fatal to slow moving animals	Less likely to kill slow moving animals
May legally operate year round	Legally restricted to 1 November - 31 March	Generally restricted during bird breeding season 31 March - 1 August

ii. Cutting

Cutting of heathland habitats is the other main management tool to burning to supplement primary grazing management. Cutting, burning and grazing have different impacts upon the vegetation which are of considerable ecological significance. A comparison is included at Table 3.6.1.3

In the Forest cutting by tractor mounted swipe is used to make fire breaks, and to cut more uniform heather stands or areas containing dense bracken when the cut material will be harvested and useful by-products removed. It is also used where it is too dangerous to burn. The Forestry Commission used to cut and bale heather in the 1960's and 1970's for sale in the road building industry, but the practice ceased. However, cutting has taken on an new significance in the Forest with the recent use of heather bales for mire restoration under the LIFE 2 programme. Clearly, such mechanised harvesting can only occur on sites where suitable machinery can operate safely. In the past heather, gorse and bracken were harvested by hand by commoners for a variety of uses including bedding, thatching, fodder, and foundation material for tracks and roads. Such practices have largely disappeared, requiring more intensive interventions by more modern methods to maintain control. A significant advantage of cutting and harvesting is that it is far less reliant on precise weather conditions than burning. However, the down side is that it is a costly operation, though costs may be offset to some extent by sale or effective use of by-products.

Impact: Heather plants cut in February may grow and flower again in the following August. Species which sprout readily from the base (eg broadleaf trees and Rhododendron) or have underground rhizomes such as bracken will continue to thrive in the absence of further treatments. However Scots pine is killed when cut providing all lower branches are removed.

Cutting, in the absence of forage harvesting, produces large quantities of debris and does not effectively remove the litter layer. This debris has the potential to inhibit regeneration and increase soil nutrient levels. Sanderson (1994) notes that the rapid flush of *Molinia* growth in the post-burn period attracts in grazing animals which quickly control the *Molinia* leading to a superior quality of heathland regeneration. Conversely, cutting does not produce an equivalent scenario, and grazing animals are less attracted to post cut stands than post-burn stands. Such an impact is likely to be short term however, and provided cut materials are removed (as in the Forest) grazing animals will eventually hasten the break up of remaining debris and litter and reduce the potential for serious nutrient enrichment.

Disturbance to ground nesting birds is critical, and cutting does not take place in the period 31 March - 1 September. Particular caution is required in relation to woodlark which nest in suitable habitat in early March, and nightjar may continue nesting until late August.

iii. Turf cutting

Turf cutting for fuel or turbary was a widely practised right of Common for many centuries until it largely died out at the end of the 19th century as alternative domestic fuels became widely available. The extent of turf cutting was apparently on a quite phenomenal scale, (Tubbs (1986) refers to some six million 0.3m x 0.3m turves being cut per annum), and one would expect some significant ecological impact from such a practice and its disappearance. It must have created a significant area of bare ground in the deeper peaty humid soils and thereby had a significant impact in diversifying the vegetation and possibly encouraging a wider range of species within the overall mosaic of bare to re-vegetated patches. However, in the New Forest, grazing, cutting and burning together maintain a wide range of habitat conditions, and there is actually little evidence to show that discontinuance of turbary has resulted in the loss of populations of any individual species with the possible exception of Stags Horn Clubmoss.

There is no significant practical application for the localised resumption of turf cutting in the New Forest for nature conservation reasons, other than the possible use of turf plugs from adjacent spoil heaps in mire restoration projects.

Issue 4: Exotic and native species requiring management or control *Rhododendron ponticum*, *Gaultheria shallon*, *Crassula helmsii*, Birch, Common Gorse, Bracken, Scots pine

Grazing, cutting and burning maintain the overall fabric of the heathland in favourable condition. This section describes the issues relating to specific species in the heathland ecosystem which may require additional treatments from time to time.

A: Non-native species requiring control or eradication

Note that there are a considerable number of exotic species established within the cSAC, and undoubtedly more will arrive in the forthcoming years. However, most are benign, and this management plan addresses those which require eradication or tight control as a result of their capacity to spread and dominate habitats and affect condition.

Rhododendron *(Rhododendron ponticum*): A highly invasive shrub introduced from Asia as a garden ornamental and currently abundant in private grounds throughout the New Forest, where it is likely to remain a constant source of establishment by seed. It has negligible nature conservation or browse value and casts dense shade which excludes native heathland vegetation. Following removal there may be a period of little heathland regeneration as Rhododendron litter and leachates have a sterilising effect on the soil. Significant progress has been made on its eradication from the open heathland under the LIFE 2 programme.

***Gaultheria shallon*:** This is an invasive ericaceous shrub from north west America which spreads inexorably by a system of underground rhizomes. Its leathery leaves resist penetration of herbicides and once established it dominates the ground and understorey layers of both wood and heath. There is a major infestation covering up to 12 ha of woodland south of Fletchers Hill near the Rhinefield Hotel. Small patches are known elsewhere, eg on heathland at Roydon Woods. It is not a major problem on existing heathlands but may be an additional issue to address when implementing Forest Design Plan proposals for heathland restoration in these areas.

***Crassula helmsii*:** An aquatic plant from Australasia which has become invasive in the British Isles in recent decades. It is present in many permanent and temporary ponds throughout the Forest and poses a threat to the native flora and fauna, including the rarities such as *Ludwigia palustris* and *Galium constrictum*. Colonisation of a pond is followed by rapid growth creating a blanket cover which out- competes the native flora. This in turn will have a deleterious impact on the invertebrate communities of that pond either directly, through creating a blanket cover or indirectly through the loss of native plant species upon which the invertebrates depend.

It is a difficult species to remove entirely in that effective control methods will also eliminate non-target native species. However, periodic mechanical control, together with the continuation of grazing management as has occurred at the East End marl pits would appear to keep the species in check.

B: Native species and re-introduced species requiring rotational management

Common Gorse (*Ulex europeaus*): a native and very important component of heathland vegetation, both for nature conservation and for commoners stock. It supports a wealth of heathland invertebrates and is vital for Dartford warbler. It has the capacity however in the absence of management to become degenerate (and may die) and of less value for wildlife and commoning. As a legume it has root nodules which contain nitrogen-fixing bacteria which have the potential to enrich soils which can ultimately encourage the spread of bracken. It is notorious for colonising disturbed ground.

Bracken (*Pteridium aquilinum*): A native and important component of the heathland ecosystem in both the positive and negative sense. From the nature conservation perspective Bracken plays an important role in reducing grazing pressure and climatic exposure for grazing-sensitive plants (eg Wild gladiolus) and plant communities (and probably invertebrates also). Sanderson (1998) has recently highlighted and classified the herb-rich bracken community where scattered bracken on brown earths is intimately associated with species-rich acid grassland. On podzols and associated with heather dominated vegetation bracken is viewed in a negative sense and measures are advocated for its control.

From the commoning perspective bracken was undoubtedly once a valuable product for animal bedding and was cut on a large scale until relatively recently. The decline of this activity is regrettable and has undoubtedly led to a considerable build-up of bracken litter and decline in pastoral and nature conservation quality on many stands. Bracken is now regarded as something of a problem, due to its capacity to spread, and covers swards and reduces the grazing value, but as Sanderson (1998) notes the ecology of grazing and bracken is complex in the New Forest. Grassy bracken stands are only lightly grazed in early summer and the shading effect of bracken fronds preserves a green sward into late summer when many acid grassland communities become very parched. At this time the grassy and herb-rich bracken stands can be a very important source of grazing. There has recently been a revival in cutting bracken for composting though using modern-day mechanical harvesting techniques.

Hence whilst bracken control on heather dominated communities and dense stands with thick litter layers is desirable, extending such management to herb-rich bracken stands would not only be counter productive but also damaging to the nature conservation interest.

Birch : Two native species, Silver birch (*Betula pendula*) and Downy birch (*Betula pubescens*) which contribute much to heathland conservation though once again, require control if they are not to become invasive and drive the community towards woodland. A particular issue with prolonged birch cover on heathland is the dramatic changes in soil chemistry, particularly raised levels of pH, extractable phosphorus and exchangeable calcium, which pose real problems for successful heathland reversion. (Mitchell, R.J., Marrs, R.H., Le Duc M.G. and Auld, M.H.D. 1997).

Scots pine (*Pinus sylvestris*): Re-introduced to the Forest as an ornamental tree in the 18th century and a forestry species in the 19th century, Scots pine has had a major impact on Open Forest habitats due to its phenomenal capacity to seed and thrive on southern heathland ecosystems. This species has the capacity to cover large areas of heathland habitat and will ultimately create dense woodland conditions to the detriment of the Forest's special interest and open heathland vistas. It is recognised however, that individual discrete pine stands have a place in the New Forest particularly from a landscape perspective.

There remains today a continuing requirement to reduce the overall cover of mature pine on the open heath to more sustainable levels and to maintain a programme of cut and burn to control seedling expansion which will not be controlled by grazing.

Issue 5: Drainage, impacts and priority for restoration action

Current estimate through monitoring works carried out by FC and EN during the past four years is that some 71% of the mires systems in the New Forest are in unfavourable condition; (Cooch & Weymouth 2000). A number of factors have led to this including invasion by *Rhododendron* and Scots pine, birch encroachment and the legacy of the past 150 years of attempted drainage programmes and subsequent erosion of peat.

Since a very high value is now placed on the nature conservation importance of New Forest mire systems (and indeed extensive wetland systems elsewhere), further destruction of mire systems from new drainage schemes can no longer be sanctioned. The issue to be addressed therefore centres on the restoration of damaged mires and how such a programme can be pursued without unduly compromising the condition of other important Forest habitats (eg wet grasslands) or unnecessarily and adversely impacting upon commoning.

The impact of wet heath and mire drainage

Pasmore (1977) gives an account of the early history of drainage particularly in relation to the Verderers. The physical and ecological effects have been described in detail by Tuckfield (1976), Tubbs (1986) and Clarke (1988). Three phases of artificial drainage have occurred; the mid-nineteenth century, the 1920-1930's and the recent post-war era. The switch from labour-intensive hand-digging to machine dug drains, particularly focussed towards timber production in Inclosures intensified the impacts, which overall has left the hydrological integrity of the wetland ecosystem severely disrupted resulting in:

- continuing headward erosion into pristine mire systems;
- changes in plant communities, impoverished flora and fauna, increase in scrub encroachment;
- reduced potential for storage of water on the Forest in drought and flood;

- increased risk of flooding to local communities as ability to hold water on the Forest is reduced;

- drying out of headwater streams in summer, with consequent adverse impact on ecology (eg fish populations);

- deeply eroded channels in stream beds cutting through the gravels, leaving other habitats such as riverine woodland high and dry, and further increasing flood flows during times of high rainfall;

- reduced winter flooding of stream side lawns with consequent long-term reduction in nutrients and productivity for commoners stock;

- spread of scrub, particularly on spoil banks along streamside lawns, leading to secondary management issues;

- reduced capacity for the Forest to cope as global temperatures rise, annual climate changes and summers are predicted to become hotter and drier, winters warmer and wetter. The potential for water shortage for Commoner's stock in summer, and the protection of downstream communities from winter flooding are likely to become increasingly important issues.

Priority for restoration action

The priority for action lies with those mires which continue to suffer headward erosion and lateral peat slumping into pristine communities. The FC's innovative mire restoration technique developed under the LIFE 2 programme has to date been successful in containing further headward erosion on actively eroding mires (eg Denny Bog). The previous technique of using steel gabions containing stone rejects has been replaced by the use of baled heather, cut locally, to infill drainage channels. (Whilst steel gabions initially halted headward erosion, they did not raise water levels, and high winter flows washed out some gabions and cut new erosion channels around their sides). The objective is for the heather bales to silt up over time, prevent the erosional outflow of water from the mire and provide a growth medium for mire plant communities. Where artificial spoil bank material exists the spoil is placed back into the drain to supplement the heather bales and the mire profiles are restored. Clearly the rate of re-vegetation of mire community is something to be monitored over time.

Whilst there may be initial fluctuations in the transition zones of the various habitats as the system settles down and re-vegetates following restoration, the visual impact is minimal; it would be difficult for the untrained eye to detect that substantial restoration works have happened even a few weeks afterwards. Indications from the restoration work suggest that there has been no significant impact on downstream vegetation communities or grazing areas from this procedure.

Having addressed the immediate problem of headward erosion and peat slumping into pristine mire the issue then becomes, how far downstream does one proceed with drain blocking in order to gain significant improvements in mire and wet heath quality, without compromising wet grassland communities. Again the priority must be to remove the erosional force of the out flowing water, and this should determine how far downstream restoration should proceed to overcome this principle problem.

The principle objective is to prevent further active destruction of existing wet heath and mire communities and to restore the hydrological regime which will allow them to re-acquire over time those features of structure, plant and animal communities, which have been lost, and for those features to be sustained in perpetuity. ***The objective is not to attempt re-creation of mire from wet heath or wet grassland.*** Those communities have developed their own nature conservation interest, and to attempt to manipulate conditions to re-create an extinct mire would result in an overall degradation of important habitats and would be counter-productive.

Issue 6: Wet grassland, productivity and scrub management

Productivity and the importance of seasonal flooding: The wet grasslands in the New Forest are highly productive from both animal forage and nature conservation perspectives. The most productive, again from both perspectives, are those that retain the ability to receive nutrient input from seasonal flooding of adjacent water courses. Since this occurs mainly when the grass is not growing, and at a time when animals are grazing adjacent heathland or wood pasture habitats, there is little overall impact on commoning interests. These are also the lawns that are less prone to scrub invasion.

Lawns adjacent to over-deepened streams are deprived of this annual nutrient enrichment, and scrub invasion, particularly from elevated spoil banks, becomes a management issue. Where possible removal of bank-side spoil, in conjunction with raising and reprofiling stream-beds will restore winter nutrient deposition and reduce scrub invasion. However, this remains a contentious issue and further work to explore the potential for improvement in Common grazing from such restoration is planned by the FC under LIFE 3 (subject to that application being successful).

Scrub Management

For the purposes of this Management Plan scrub is defined as a vegetation of broad leaved shrubs and young trees forming an unstable community which is normally a precursor to woodland. (Gorse and Bog Myrtle are excluded as they are best regarded as an integral component of the dwarf-shrub heathland communities). Four situations are prevalent in the Forest each giving rise to management issues:

- thorn-dominated scrub on richer soils (eg wet grassland);
- birch invasion on heathland;

- sallow invasion on mire and other wet ground, and temporary ponds;
- emergent high forest derived from maturing scrub.

Scrub will have been an integral part of the ecological dynamics and economy of the New Forest since the extensive grazing system developed (Sanderson 1999). From a nature conservation perspective its value lies in presenting a further structural dimension to New Forest habitats of particular value when in transition between open heathland habitats and closed canopy pasture woodland. In this regard it is of great significance to those invertebrate communities with species less tolerant of hard grazing, and for breeding, feeding and roosting sites for birds. Scrub is of greatest wildlife value when low, dense and flower-rich, rather than tall, straggly and draughty. Scrub of this quality must be regarded as an important component of grassland and pasture woodland complexes and transitions.

Left to its own devices scrub can become a problem for open habitats given its capacity to spread over species-rich grasslands and shade out ephemeral and permanent ponds and sunny stream edges, and the Condition Assessment templates give upper limits of acceptable scrub cover for respective habitat units. From the commoning perspective concerns are expressed at the past and potential future losses of grazing from scrub encroachment, particularly on the wet grasslands.

In the light of the above the management objective for scrub is to maintain a good quality scrub component on Open Forest habitats within the limits set by Condition Assessment, and to maintain woodland edge / Open Forest transitions such that sharp boundaries between pasture woodland and open habitats are minimised.

Issue 7: Bare ground

Bare ground within habitats, either in an intimate mosaic with the vegetation or as discrete areas, is an essential component of many New Forest habitats. It is created by the foraging and trampling activities of grazing animals, digging activities of rabbits and other animals, habitat management such as burning, human activities associated with riding, cycling and walking, and through natural erosional processes from drought stress and heavy rainfall often impacting on already disturbed areas.

Bare ground has different environmental characteristics than the surrounding vegetation, providing important conditions for invertebrates at certain stages of their life cycle, and seed beds and open space for colonising plant species, contributing to the overall ecological dynamics of the Forest. For example, during the day surface ground temperatures are higher than in the surrounding vegetation, and at night they are lower due to increased radiation. The overall effect is to make exposed soils warmer on east, south and west facing slopes and cooler on north facing slopes, which together with a tendency to a drier surface layer, has significant influence on the flora and fauna of the area.

It is important to distinguish between beneficial disturbance creating bare ground conditions suitable for colonising plants and specialist invertebrates, and physical long-term damage to swards and soils. The former will normally be ephemeral and discrete, creating loose soils adjacent to undisturbed vegetation. Extensive grazing, localised rabbit activity and non-intensive recreation (eg of the kind which creates bare ground on the sides of hollowways and abandoned paths) all create good bare ground.

Damaged ground will normally be of a more permanent nature, often spreading and creating compacted enriched soils which are repeatedly eroded such that they never become available for recolonisation by vegetation or are entirely unsuitable for specialist invertebrates or reptiles. Intensive recreational activities and inappropriate stock management (eg intensive supplementary feeding) are likely to result locally in permanent damage to Forest vegetation which may require intervention to repair.

Issue 8: Recreation

A general description of the current recreational activities and their impacts on nature conservation is given in Part 1.

Most of the activities described in Part 1 occur on the heathland habitats. However the principle impacts are generated by disturbance to sensitive fauna (eg ground nesting birds) from walkers and uncontrolled dogs, and sward or soil damage from horse riding or cycling.

a. Recreational Disturbance

The principle issue from the nature conservation perspective relates to recreational disturbance on ground nesting birds, and to a lesser extent on wintering birds, (eg hen harrier roosts).

There is a considerable literature concerning the effects of recreation on wild birds including reviews by Sidaway (1990 & 1994) and Hockin *et al* (1992), which list key references to important studies and the latter provides a tabulation of references according to various impacts of disturbance on nest-site selection, breeding success, population densities, distribution etc.

There are some key points which arise from the literature, (largely based on Brown, A. 1995)

1. Certain ground nesting birds are very vulnerable to disturbance from recreational activities; they are tied to territories for periods of up to three months, during which period individual birds, people and dogs are likely to come into contact. The nature and degree of behavioural response elicited by this contact varies between species; some become motionless, relying on camouflage to avoid detection (eg nightjar), some allow a close approach whilst others will advance towards an intruder with warning calls (eg

Dartford warbler), and others will temporarily leave an area altogether (eg woodlark).

The distance at which the response is elicited by any given disturbance event varies between individuals species, stage of breeding cycle and by a birds previous exposure to the disturbance event.

2. A number of studies report that nests are trampled more frequently in disturbed areas than in undisturbed areas, that rates of abandonment of chicks or eggs or deaths to exposure, are higher in disturbed areas, or that rates of egg and chick predation are higher in disturbed areas than undisturbed areas.

3. None of these studies provide unequivocal evidence of a significant impact of recreation on wild birds populations. The fact that individual birds are disturbed by an individual event, or series of events suggests that they will incur an energetic cost, either by remaining in areas prone to disturbance or by moving away from such areas. This may or may not affect their ability to breed successfully, as disturbed individuals may be able to accommodate the energetic cost within their existing energy budgets, they may compensate for it by increasing their food intake at the same time as reducing time spent engaged in other activities or in inactivity, or they might habituate and cease to show a behavioural response.

4. Whilst some of the most important ground nesting populations are found in areas where recreational pressure is and has been for some time, considerable, one can only guess at the potential size of their wild bird populations if recreational disturbance were absent.

5. The impact of recreational activities is likely to be greater where regular easy access for particularly disturbing activities (eg uncontrolled dog walking) is provided.

6. The frequency or severity of individual disturbance events will always reach a point which deters individual birds from settling in an area for feeding, breeding, roosting, forming pairs, nesting, or breeding successfully in any area.

7. The decline in the number of nesting pairs or in their breeding success will at some point have population and nature conservation consequences.

8. Some disturbance events are more damaging than others. Dogs under close control by a fixed, short length lead are likely to have no more significant an impact on bird populations than their handler. Free-roaming dogs are likely to cause more disturbance to wild birds than an equivalent number of free-roaming humans as they tend to cover more ground, and sniff out and chase or destroy eggs or young birds.

9. The restriction of a given number of humans to a linear route will, in very general terms, tend to be less damaging to a wild bird population than the same number of humans allowed to roam freely (although this may clearly be at the expense of the individuals breeding along the linear route).

B. Erosion from recreational activities

A recent review is contained in *A Review of Recreation Pressures in the New Forest* (Clark A. (1999)), a study conducted as part of the LIFE 2 programme which aimed to determine the degree of erosion currently evident across New Forest and to identify the habitats most vulnerable to damage from the different types of recreational activities that are pursued within them. Twelve areas were identified as having significantly high levels of recreational use.

3.6.2 Generic management policies, prescriptions & rationale for: New Forest heathland habitats: wet heath, dry heath, mire, dry grassland, wet grassland, temporary and permanent ponds

3.6.2A For maintaining heathland units in favourable condition

Management Policy: ***Where the objective is to maintain the unit in favourable condition, then the favoured management option will be one of continued extensive management, through a series of rotational maintenance operations conforming to the policies and prescriptions below.***

3.6.2Ai: Generic management prescriptions for maintaining heathland habitats units in favourable condition

- Continued de-pasturing of commoners stock on all Open Forest heathland habitats, or suitable livestock elsewhere, to maintain the differential grazing pressure across the heathland habitats through the preferential feeding behaviour of the principle stock (cattle and New Forest ponies) and periodic fluctuations in overall animal numbers between upper and lower limits. The upper and lower limits are defined not in terms of animal numbers, but in terms of the grazing impact in the various Condition Assessment templates.

- Tight control on the provision of supplementary feed, restricted to authorised locations on non-sensitive habitats and localities. *(These locations are specified in Part 4 under the respective Implementation Plans.)*

- Pesticide Treatments: No change in current practice pending further research. Avermectin wormers may not be used on the Forest, and animals treated off the Forest must be given sufficient time for the active ingredients to become inert before returning to the Forest.

- Grazing will be supplemented where necessary with controlled burning in order to:

_ maintain a mosaic of heathland vegetation structures of different ages to maximise available niche separation;

_ control invasive Scots pine (and other tree regeneration not controlled by grazing);

_ regenerate ageing or degenerate heather and gorse brakes;

_ reduce the risk of wild-fire which can be highly damaging due to high temperature burn and extent.

- Grazing will be supplemented where necessary with cutting and (as appropriate) harvesting in order to:

  _ maintain a mosaic of heathland vegetation structures of different ages to maximise available niche separation;

  _ regenerate ageing or degenerate heather and gorse brakes;

  _ control potentially invasive alien and native species.

- No cultivations, fertilising or re-seeding.

- No new drainage schemes or maintenance of old or existing drains except where there is a proven requirement under health and safety or protection of dwellings or roads from flooding, or demonstrable positive impact on grazings particularly with respect to wet lawns, where the nature conservation interest will not be damaged.

3.6.2Aii Burning and cutting: agreed specification

The annual cut and burn programme will be subject to the legal requirements of the *Heather and Grass Burning Code* (MAFF 1992) and will additionally adhere to the following principles:

- management of wet heath and the more humid forms of dry heath will aim at an average 23 year treatment rotation. On the Crown lands the area treated will average out at approximately 3-400 ha per year;

- the size of individual burns / cuts will usually be smaller than 5 ha but exceptionally up to 20 ha;

- treatments in succeeding years will be well separated;

- management of the driest heath (ie that which does not produce a grassy flush of *Molinia*) will be carried out only where necessary to encourage regeneration to avoid senescence;

- gorse will be cut or burnt, in advance of senescence to encourage regeneration. On selected sites where regeneration fails soils will be appropriately managed to encourage seedling establishment;

- EN, FC and the Verderers will identify experimental areas of heathland where no burning will be carried out.

3.6.2Aiii Bracken management: agreed specification

- bracken will be managed (including harvesting for composting and sale), to maintain grazing and perpetuate associated species and communities of interest. Autumn cutting, after the 1st September, will be carried out on all suitable sites on an annual basis; earlier cutting will be permitted subject to a thorough survey of nightjar nest sites being carried out;

- spraying with agreed herbicides will be confined to areas where bracken has invaded heather or where the build up of litter is excessive and where any other management might aggravate the problem. Prior to spraying the areas will be monitored for ground nesting birds and Lily of the Valley colonies. Sprayed areas may require follow-up treatment in subsequent years to be effective.

3.6.2B: For restoring heathland units to favourable condition:

Management Policy: ***Where the objective is to restore units to favourable condition, then additional management operations may be required in the short term, conforming to the generic prescriptions below.***

3.6.2Bi: Generic management prescriptions for restoring heathland habitat units to favourable condition

a. Where habitats are in unfavourable condition as a result of over or under-grazing, then the following options should be explored as circumstances at the time dictate:

- Move stock from one part of the Forest to another, with commoners participation, perhaps with a small inducement. To be effective such measures should take full account of the differential social, physiological and foraging behaviour of the key grazing animals, and their differential impacts on the New Forest vegetation. Ponies in particular, are notorious for finding their own way back to their own haunts. Cattle are in principle easier to manage in this way but issues relating to animal welfare (stock checking and periodic or emergency treatments) would need addressing. Despite these difficulties, such an approach is currently being explored by the National Trust to address grazing related issues within their Commons.

- Adjustment of the marking fee (or equivalent) to a level more representative of the value of New Forest grazing. Schemes whereby the fee could operate on a sliding scale related to grazing pressure around an 'ideal range' penalising when too high or encouraging when too low have been advocated in the past (Tubbs 1986). There may be merit in exploring such a scheme in the future, particularly in combination with other pro-active initiatives such as stock quality control schemes and appropriate agri-environment schemes balancing one against the other. However it should be noted that the marking fee is for services provided by the Agisters and in principle cannot be used to reflect the value of the grazing which is a right of Common.

- Pony premium and subsidised cull schemes. The New Forest pony and certain native breeds of cattle (eg Galloway cross) undoubtedly fare better in the Forest and crucially have a greater beneficial impact on the vegetation, than do other breeds less well adapted to conditions in the Forest. Previous attempts to try and improve the genetic constitution of the New Forest pony, eg by the addition of Arab traits, have not always had a beneficial effect. It is crucial that stock capable of grazing the Forest habitats in the desired way, whilst also being able to survive the winter hardships and produce profitable offspring, are favoured over other breeds which contribute less to Forest habitat management.

Schemes which favour the selection of appropriate breeds and reward good quality stock have been trialed and are demonstrably effective, (eg the mare premium scheme run by the Verderers under the LIFE 2 project). A programme that combined an incentive for good hardy Forest stock with a subsidised cull programme for poor stock or breeds less well adapted to the Forest would be highly beneficial.

The Verderers and the Commoners Defence Association are currently exploring the merits of a general cull of Forest ponies which will be entirely voluntary. It is hoped that in the longer term this will produce a better quality animal which will be easier to market. It is hoped that commoners will take the opportunity to dispose of poorer quality mares, barren and older ponies. In principle this could generate a substantial reduction in the numbers of depastured ponies, though this has not yet been quantified.

- Support mechanisms for commoners. There is currently no viable alternative to commoning as a mechanism to de-pasture animals on the Open Forest. Much has been written about the ups and downs of the commoning community and the potential for commoning to become so costly an activity that it becomes unsustainable (it is currently entirely unprofitable). Mechanisms to off-set the costs associated with commoning, largely related to poor market values for produce, expensive back up land and astronomically priced housing in the area are all worthy of further exploration. Whilst further discussion of such schemes is beyond the scope of this Management Plan, it is worth noting that the Forestry Commission are currently examining ways of offering FC owned Forest properties at preferential rates to commoners, and the Hampshire Wildlife Trust are devising ways of continuing to purchase back-up land which can be preferentially offered to commoners to help resolve stock management problems.

- Supplementary Feeding: the principle mechanism over which impacts of overstocking may be managed lies with the exertion of tight controls on stock feeding. In principle there should be no provision of supplementary feed in the Forest due to its adverse impacts on sensitive vegetation, and its potential to raise stocking levels above that which is naturally sustainable.

However, it is difficult to envisage how cattle could be encouraged to winter graze dry heath without the provision of some supplements at carefully regulated feeding stations. However, the practice of running large (1-200 animals), over-wintering cattle herds, which demands intensive supplementary feed is to be discouraged. Experience dictates that such a practice causes demonstrable and long-term damage to Forest habitats, and is disadvantageous to those commoners with smaller herds, and is contrary to good commoning practice. It is worth noting that the provision of artificial feed becomes self-regulatory as herd size decreases as it simply results in feeding other peoples animals with consequent financial penalty to the provider.

- Theoretically manipulation of stock levels and grass productivity could be achieved using temporary fencing to facilitate the temporary exclusion of animals from certain habitats to exert a degree of control over forage availability and timing. The grasslands would be the primary focus of such a scheme. In practice however it would be fraught with practical difficulties, and most certainly controversial; to prevent animals grazing lawns would be virtually impossible unless huge numbers were taken off the Forest.

Of more fundamental importance is that the more productive grasslands are vital in maintaining the imbalance in grazing pressures with low productivity habitats, which are more sensitive to grazing pressure, receiving less attention. With the robust better grazings fenced off, increasing pressure will occur on more sensitive habitats resulting in shifts to unfavourable condition, and hence such a practice would be unacceptable.

- In principle the periodic exclusion of commoners stock from the Forest using modern-day equivalents of the Fence Month (14 days either side of mid-summer), and the Winter Heyning (Michaelmas (29 September) to Hocktide (after Easter) 1537; since 17th century 22 November to 4 May), represent alternative methods of stock control. The historical aspects of these techniques and the negative response from commoners who regarded the Office of Woods attempts to enforce the fence month and winter heyning, are covered in Tubbs (1986). In practice it probably had little impact on stocking levels as the Fence Month in particular was completely impractical and totally at odds with the ancient farming system. It was probably therefore more effective as a fund raising measure than a stock control measure, since stock were allowed on the Forest provided a payment was made.

It is difficult to see how periodic stock exclusions of this kind could operate successfully within the wider Forest agricultural stock management system. It would probably be legally unworkable and impossible to implement without incentives. In any case the nature conservation implications of such a practice would require very careful consideration.

- The New Forest has traditionally been part of a much wider grazing and stock management system. Cox and Reeves (2000) note that some 2,000 ha of grazing land, equating to some 10% of the grazing lands in the New Forest, was lost to the commoners stock following the fencing of the perambulation in 1964. It is crucial that the New Forest SAC does not become increasingly isolated from the wider countryside in the future. In particular links between other habitats outside the perambulation, where wintering of Forest stock could take place, or where traditional hay meadow management could be encouraged, providing species-rich habitats not represented within the perambulation, locally produced fodder and aftermath grazing, need to be maintained, or where lost, reestablished.

The forthcoming designation of the New Forest National Park, the setting up of a National Park Authority with a focus on Forest-wide land management issues and with a budget to implement solutions may have a highly beneficial role in this regard. Currently, the Countryside Agency (2000) have drafted a National Park boundary for wide consultation. It includes the relevant coastal section of the wider Solent cSAC and SPA and the River Avon cSAC and Avon Valley SPA, and appears to encompass the bulk of land to which Rights of Common apply. Within the framework of the National Park every opportunity should be sought to develop mechanisms whereby commoning can play its vital role within the Forest cSAC and in the wider context. The Forest Friendly Farming initiative set up under the auspices of the New Forest Committee, will provide a useful steer in developing workable solutions to maintain semi natural habitats in the wider National Park, but also to help sustain commoning for the benefit of future generations.

b. Where units are in unfavourable condition due to the presence of unacceptable levels of non-native trees and shrubs

Where units are in unfavourable condition due to the presence of unacceptable levels of non-native trees and shrubs then intervention is required through their systematic removal to a level not exceeding the targets stipulated for unfavourable species in the condition assessment templates (eg <1% cover for *Rhododendron* and <5% cover for trees or seedlings of Scots pine or birch on wet or dry heath). In all cases mechanical disturbance to the heathland unit must be minimised, and this should be the primary consideration in deciding which management technique to use.

Rhododendron ponticum: Complete removal from the whole SAC will be attempted. For areas accessible to mechanical harvesting, then bushes can be dug out and either mulched in situ or transported off site for burning. Regrowth should be treated with an appropriate herbicide (eg Roundup) or further mechanical intervention in the following two years. Where ground conditions are unsuitable for machinery access, bushes should be cut by hand to ground level followed by stump treatment with herbicide. It is acceptable to burn up on the site of former dense *Rhododendron* cover. Any initial changes in vegetation due to nutrient release will be restored by grazing.

Gaultheria shallon: Complete removal from the whole SAC will be attempted. An eradication experiment using enclosed pigs was trailed in 1998 at Fletchers Hill, the results of which indicate that whilst the pigs do not eat the *Gaultheria* they do grub out the roots and expose it to the air. It is as yet too early to assess whether this is an effective control method. It is likely that effective control will require further treatments with herbicides, or mechanical techniques such as turf stripping.

Scots pine: Scots pine will be removed except where they form important landscape features (as either small stands or single specimens), or where their removal would be damaging to surrounding heathland habitats and soils. In these cases other methods of control such as ring barking or felling without extraction should be considered.

Crassula helmsii: Treatments in accordance with best practice.

c. Where units are in unfavourable condition as a result of artificial drainage

Where units are in unfavourable condition as a result of artificial drainage the management objective is to prevent further active destruction of wet heath, wet grassland and mire communities and to restore the hydrological regime which will allow them to re-acquire over time those physical and biological characteristics which have been degraded or lost. This is likely to require:

- the halting of headward erosion into mires and wet heath using appropriate restoration techniques including infilling of artificial drainage channels with heather bales and turf plugs taken from adjacent spoil banks;

- the halting of peat slumping from wet heath and mires arising as a result of artificial drainage channels, using appropriate restoration techniques including infilling of artificial drainage channels with heather bales and turf plugs taken from adjacent spoil banks;

- the implementation of sufficient bed level restoration measures downstream of any nick point to ensure that the erosional outflows are reduced to a level whereby further erosional nick points are not generated, without significantly compromising wet grassland habitats;

- the restoration of seasonal inundation and natural drainage of wet grassland to reinstate winter nutrient deposition and reduce scrub invasion. Techniques used will depend on site characteristics but are likely to include re-profiling of artificial land forms (eg spoil banks) and raising of bed levels in adjacent streams.

d. Where units are in favourable condition as a result of scrub cover, specification for scrub management

Where units are in unfavourable condition as a result of scrub cover the management objective is to maintain a good quality scrub component on Open Forest habitats within the limits set by Condition Assessment, and to maintain woodland edge / Open Forest transitions such that sharp boundaries between pasture woodland and open habitats are minimised.

Three treatments are likely to be required depending on the situation:

i. Where adjoining habitats (wet grassland, mire and heath) are in unfavourable condition due to the spread of dense birch, sallow and scrub from emergent woodland then removal sufficient to restore the habitat in question to favourable condition is necessary.

ii. Transitions which are not threatening these primary habitats (eg over bracken) should not be cleared and the birch will be retained to biological maturity, especially in those areas where the development of young woodland of oak, beech and birch is desired. There is no merit in clear-felling such transitions but consideration should be given to managing the emergent woodland to hasten an appropriate structure (eg pollarding or thinning) to avoid a rather dull closed canopy woodland edge.

iii. Early 20th century dense, young canopy woodland which has spread over former or relic primary habitat, eg wet and dry grassland, and where this primary interest is recoverable, should be removed and the primary habitat restored.

Specification for scrub management

- Avoid wholesale removal of scrub from primary habitats as this can be devastating to the fauna dependant upon that habitat. It is better to treat small patches in a rotation so that sufficient good quality habitat is retained at all times. This will vary from location to location and will be a matter of ecological judgement within the limits set by Condition Assessment. Some protection using cut brash may be necessary to protect re-growth from browsing.

- Retain good quality scrub on primary habitats within Condition Assessment limits, ie that which is dense low, and flower-rich. Aim to treat scrub in rotation to maintain it in good condition.

- Remove poor quality scrub on primary habitats which is tall, straggly and draughty, along with young broadleaves which will result ultimately in dense emergent woodland.

- Consideration should be given to pollarding appropriate specimens of oak, beech and ash particularly in dense stands of emergent woodland where creation of an open scrubby transition is desirable.

- Due to the ecological complexity and degree of judgement and expertise required to plan sensitive scrub management on these habitats, it is essential that detailed individual site plans are compiled using appropriate specialist expertise where necessary prior to any works taking place.

e. Where units are in unfavourable condition due to the presence of compacted/ eroded bare ground

Where units are in unfavourable condition due to the presence of compacted / eroded bare ground (outside the acceptable limits defined in the Condition Assessment templates), then intervention to repair eroded ground may be appropriate. However:

- Application of repairs to eroded surfaces should only be applied where further damage to nature conservation interests will not occur as a result of repair works.

- The emphasis should be on natural regeneration of vegetation cover rather than import and spread of additional materials. Such an approach may require temporary closure of car parks or recreational 'hot spots' to be successful.

- There should be a presumption against the building of new permanent paths using imported gravels, though it is recognised that in certain locations such measures may be appropriate in the last resort.

- In order to avoid unnecessary damage and / or disturbance to sensitive habitats programmes to restore 'eroded' habitats should be subject to detailed planning and evaluation.

f. Guidance on ground nesting birds and recreational disturbance

The aim is to keep people and dogs away from ground nesting birds, or to reduce the potential impact to a level where it does not adversely impact on bird populations. The following management guidance may reduce the impacts:

- car parks and other popular visitor facilities, may need to be subject to seasonal closure or restrictions;

- visitors should be encouraged to avoid where possible, or at least to move quickly through, sensitive areas, and accompanying dogs should be kept under tight control on leads, when they are likely to have no more significant an impact on wild bird populations than their handler;

- visitors should be encouraged to stay on well used linear routes particularly during sensitive periods for wild bird populations;
- increase public awareness of the issue by providing explanatory signs at key access points.

3.7 New Forest Inclosures: issues, generic prescriptions and rationale

3.7.1 Introduction

This section discusses the aims for the management of the New Forest Inclosure habitats (Statutory and Verderers and enclosed ancient semi-natural woodland outside the Crown lands), the issues affecting their condition, and sets out where relevant the generic management guidance and rationale required both to maintain those units currently in favourable condition, and to restore those units currently in unfavourable condition.

Note that only those Inclosures subject to management to secure the aims in 1, 2, 3, and 6 below and from which significant nature conservation benefits will accrue will be subject to Condition Assessment Monitoring.

3.7.2 Principle aims for management of Inclosure woodland

The issues described below relate differentially to the six principle aims for the management of Inclosure woodland. These aims may be summarised as:

1. To restore primary habitats (eg mire, wet heath, dry heath, riverine woodland, pre-Inclosure broadleaf and 18th and early 19th century broadleaf plantations) to Open Forest management.

2. To restore primary habitats which will remain within Inclosures.

3. To restore secondary habitats (eg broadleaf plantations on ancient woodland sites), which will remain within Inclosures to a semi-natural character.

4. To maintain a mixed woodland cover of broadleaf and conifer within Inclosures.

5. To carry out commercial silviculture, (largely coniferous).

6. To maintain or restore ancient semi-natural woodland on non-Crownland sites (eg Langley Wood, Whiteparish Common) to favourable condition.

3.7.3 Issues affecting Inclosure woodlands

Significant issues affecting or having the potential to affect the condition of Inclosure Woodland are listed in the following table, and are discussed below:

Issues Pertaining To Management Required To Maintain Favourable Condition		**Issues Pertaining To Management Required To Restore Favourable Condition**

Woodland Management: Felling and re-stocking (natural regeneration and planting) Timber extraction, machinery & access, ride management,		Management of primary habitats currently inclosed.
		Management of broadleaf woodland
		Non-native tree & shrub management
		Drainage & soil disturbance

Whilst these issues may be common to all Inclosures, their potential impact is dependent upon which principle aim one is seeking to achieve. For example, where the aim is restoration of a semi-natural broadleaf woodland, then the removal of non-native trees and shrubs, ultimately to below the 1% cover target for favourable condition specified in the corresponding Condition Assessment table, is clearly an important issue. However, where the principle aim is to carry out coniferous silviculture, then the cover of non-native species becomes less relevant. Hence, this section discusses issues in relation to the principle aims.

Aim 1. Where the aim is to restore primary habitats to Open Forest management

The primary habitats are those for which the cSAC has been designated and include mire, wet and dry heath, wet grassland, pasture, riverine and bog woodland, in addition to those habitats which have reached a significantly advanced stage of development towards becoming SAC habitats. The latter are principally the 18th and early 19th century broadleaf plantations which given sufficient time under Open Forest management conditions will develop into old growth pasture woodland.

The issues affecting such habitats relate principally to the cover of non-native or inappropriate species, disruption to land form and hydrology and the management interventions required to restore the habitats to a condition where they can return to Open Forest management.

Restoration of heathland habitats (wet and dry heath and mire), requires the removal of tree cover, the infilling of drains and the immediate reinstatement of grazing by commoners stock, together with full integration within the Open Forest cut and burn programmes. Where substantial areas of conifer Inclosure are to be restored to heathland habitats (eg the Verderers Inclosures) then considerable disruption to the ground surface, temporary inconvenience to the public and significant changes to the landscape are inevitable. Such issues will be addressed through the 'New Forest New Future' initiative by the Forestry Commission and under the guidance of the Forest Design Plan Forum.

Restoration of pasture, riverine and bog woodland also requires the removal of non-native species, and may require adjustments to the pre-enclosure drainage pattern. In addition, some sites may require treatment of dense holly or other understorey which in the absence of domestic grazing has created shaded conditions unsuitable

for maintaining the special interest features. Early return to Open Forest grazing management is highly desirable.

The early 19th century plantations which have, or will acquire over time, characteristics of pasture woodland will undergo limited interventions to remove non-native species and inappropriate drainage systems, but will not be subject to further silvicultural treatments (eg thinning or selective felling). Whilst such treatments may improve the biodiversity of such stands and hasten the restoration to woodland more characteristic of the New Forest pasture woodland, the Forest Design Plan Forum has decided that this would be inappropriate at this time and so a gradual restructuring through natural processes under Open Forest management is preferred.

Aim 2. Where the aim is to restore primary habitats which will remain within Inclosures

Whilst a significant proportion of existing primary habitats will be returned to Open Forest management, inevitably there will be parcels which will remain trapped within Inclosures. The issues associated with, and management required to maintain heathland and pasture woodland habitats in favourable condition are described elsewhere. These apply equally to trapped parcels within Inclosures as to the Open Forest or those in private ownership. Grazing, and in the case of heathland habitats, cutting and burning are essential components of management required to maintain favourable condition. Where grazing or burning are not sufficient or possible then cutting and harvesting programmes will need to be increased to maintain open habitats.

Hence, generic prescriptions offer a range of options to substitute for normal Open Forest management. Where possible all primary habitats should be subject to at least periodic grazing. The introduction of managed grazing regimes to certain Inclosures would be ideal. However, the Verderers are of the opinion that Inclosures can either be thrown open to grazing (periodically) or remain enclosed and the introduction of a limited number of stock to an Inclosure to address habitat management requirements is not a legal option. The Forestry Commission have challenged this view and maintain that in principle livestock could be used to address specific management issues (eg tree establishment) provided they were not there simply for grazing (ie animal productivity). This matter is yet to be resolved. In the meantime, seasonal grazing where Inclosure gates are opened for a period of time over the year is acceptable. Commoners stock will exercise a similar differential grazing pressure on such Inclosures as they do on Open Forest habitats and both stock and habitats will reap significant benefits.

Where it is not practicable to introduce sufficient grazing management to maintain trapped habitats in favourable condition, then rotational cutting and harvesting programmes will have to be significantly increased to substitute for grazing and maintain open conditions.

Aim 3. Where the aim is to restore secondary habitats to favourable condition but to retain them within Inclosures

These are principally woodland habitats which are derived from broadleaved plantations of varying age mainly on ancient woodland sites. They have retained, developed or have the potential to develop the characteristics of semi-natural woodland. A range of generic prescriptions are given, the choice of which will depend upon the practicalities of implementation and detailed objectives for management. The over-riding-principle is that the woodland will be actively managed towards a semi-natural broadleaf character. This means that a wide range of interventions may be desirable including structural diversification through felling and regeneration of broadleaved stands, or in some cases, enrichment planting of characteristic species not currently present.

The capacity exists within these Inclosures to generate conditions suitable for those groups (flora and fauna) which are not well represented under Open Forest management conditions, and which have declined within the Inclosures and in woodlands elsewhere this century.

Aim 4. Where the aim is to maintain a mixed cover of broadleaf and conifer within Inclosures:

Such stands will be of less significance for nature conservation and will not be subject to Condition Assessment monitoring. However, the aim is to allow a gradual successional progression towards more diverse woodland with appropriate species on appropriate soils. This is likely to result in the concentration of birch, pine and other conifer species on ex-heathland soils, and birch, oak and beech on richer soils. In this way future decisions regarding further restoration of Inclosures to open habitats or to broadleaf woodland will not be compromised.

Aim 5. Where the aim is to carry out coniferous silviculture

Such stands have little significance to nature conservation and will not be subject to Condition Assessment monitoring. No generic guidance is provided, but management will be in accordance with *The UK Forestry Standard: The Governments approach to sustainable Forestry* (Forestry Commission 1998).

Aim 6. Where the aim is maintain or restore ancient semi-natural woodland to favourable condition

These are fenced broadleaf semi-natural stands on ancient woodland sites within the cSAC but outside of the Crown lands. Subject to the removal of non-native species and restoration of inappropriate drainage systems, the precise management option followed depends very much on the detailed objectives for the individual site. For example Langley Wood is of sufficient size and character to eventually be managed under a non-intervention policy, whilst Loosehanger Copse would be more appropriately managed under a coppice-with standards system.

Aim 7. Issues related to forestry operations and woodland birds

The restoration over time to favourable condition of primary and secondary habitats within New Forest Inclosure woodlands requires targeted forestry interventions such as thinning and harvesting. The scale of the task, coupled with the water-retentive nature of the gleyed soils within many of the Inclosures means that the flexibility associated with year-round working is desirable. However, such forestry and woodland management operations have the capacity to disturb and destroy protected birds during the breeding season.

Potentially, the most disruptive aspects of forestry are felling and harvesting. Such activities are rotational, ie individual compartments are treated on a rotational basis over time, (eg harvesting operations operate on a 5 year cycle for conifer and 10 year cycle for broadleaves). In large woodland system such as the New Forest, actual disturbance is localised to discrete areas and much of this will be implemented outside of the bird breeding season. This means that the potential to impact on overall bird populations, particularly for widespread species, is limited. Careful operational planning should ensure that rare and specially protected species such as

honey buzzard remain unaffected, and hence the potential for forestry operations to become a nature conservation issue by affecting species at the population level is unlikely to arise.

However all woodland owners and their forestry contractors are required to operate within the law with respect to wild birds.

Wild birds and the law

The primary legislation affecting wild birds in England, Scotland and Wales is the Wildlife and Countryside Act 1981, and its subsequent amendments. The basic principle of Part 1 of the Act is that all wild birds (with certain exceptions relating to wildfowl, game birds and pest species), their nests and eggs are protected by law. Some rare species are given special protection.

It is an offence to intentionally:

- kill, injure or destroy the nest of any wild bird;
- take damage or destroy the nest of any wild bird while in use or being built;
- have in one's possession or control any wild bird (dead or alive) or part of a wild bird, which has been taken in contravention of the Act;
- have in one's possession or control an egg or part of an egg which has been taken in contravention of the Act.

In addition to this general protection, most rare breeding species listed in Schedule 1 of the Act are further protected by special penalties. For these species it is an offence to intentionally disturb any Schedule 1 species while it is nest building or is at, or near, a nest with young, or to intentionally disturb the dependent young of such a bird.

Exceptions: An important defence to any prosecution that might be brought is the exception that where the taking, damaging or destroying of nests has occurred inadvertently as an incidental result of a lawful operation by an authorised person (ie the owner or occupier or any person authorised by the owner or occupier), no offence has been committed. All recognised forest operations are lawful and although these can be carried out in the nesting season and in areas where nests of common birds will perhaps be destroyed, the spirit of the Act is clear - the needless and deliberate destruction of nests with eggs and young is unacceptable and the onus is on the owner to carry out operations in a reasonably sensitive way. The position with regard to Schedule 1 species is slightly different in that intentional disturbance by anyone, including authorised persons, is an offence, but unintentional disturbance in the course of carrying out a lawful activity is not. Advice on planning to avoid disturbance is given below.

Woodlands and breeding bird densities

There is no such thing as a 'typical woodland bird community' and the densities and numbers of birds found in woods varies enormously. Bird census studies indicate that breeding bird densities in woods commonly range from 200 - 1600 territories per square kilometre (Fuller 1995). As a general rule the number of species present increases with woodland size. Also the number of species and the overall breeding bird density increases as the trees grow bigger and the woodland stand becomes more mature. Bird communities are also richer in woodland habitats that have the greatest structural diversity. Young coppice stands and plantations at the thicket stage are the exceptions to these general rules as they support relatively high bird densities. Woods which contain the following characteristics are more likely to support high densities of breeding birds or species that are scarce in a local or national context:

- Large old trees, particularly those with rot holes, cracks under the bark, or hollow trunks. (Such trees are also likely to be important for bats, lichens, fungi and saproxylic insects).

- Dense understorey (0.5 - 3.0 m height range) of shrubs, coppice regrowth or bramble which provides the nesting habitat for many warblers and other small song birds.

- A predominance of native trees and shrubs with a mixed age structure.

- Pre-thicket conifer stands less than 15 years old, typically on ex-heathland soils.

Plantations which are less likely to hold high densities or bird species of concern tend to be the following:

- Even-aged conifer plantations more than 15 years old. Whilst old conifers can provide nest sites for rare raptors (eg Honey Buzzard), such species use broadleaved trees quite happily.

- Even-aged broadleaved plantations of between 20 and 60 years with little understorey or field layer.

- Even-aged lowland coppice of more than 15 years that cast a dense shade resulting in a poor understorey and field layer.

Planning to avoid disturbance to breeding birds

Most, if not all plantations will support some breeding bird interest. However, in the context of the New Forest Inclosures the following should be bourne in mind when planning forestry operations:

- The risks associated with causing disturbance to breeding bird communities is highest in plantations which have evolved a more semi-natural structure and composition, and lowest in those plantations of uniform even-aged conifer or young (20-60 year) broadleaf.

- In the early stages of restoration of heathland, from dense conifer stands, the risk of causing disturbance to breeding bird communities is low. However as thinning / clearance progresses, and conditions suitable for woodlark or nightjar evolve, the risk of disturbance to these species increases.

- The Schedule 1 species regularly breeding within New Forest Inclosure woodlands are honey buzzard, crossbill, and firecrest. Honey buzzard may use nest sites in old conifer or broadleaved trees, whilst firecrest occur in a variety of broadleaf, conifer or mixed stands. Crossbill favour spruce crops in conifer plantations and are a species subject to periodic irruptions coinciding with spruce crop failure in the boreal forests of northern Europe.

- The main breeding period for most woodland birds is April to July inclusive. However crossbill may nest in January, and firecrest may extend to the end of August. The great majority of resident species lay first clutches (which are generally the most important) in April and May, whilst summer visitors generally lay their first clutches in May.

- Warm winters and early springs may lead to birds breeding earlier than usual. Conversely, poor spring weather could lead to later nesting or poorer productivity from first broods.

- Major operations within ecologically rich areas should take place outside of the main bird breeding season. Where this is impracticable (eg due to poor ground conditions) then it is strongly recommended that preliminary bird survey be carried out to locate nest sites. Where a schedule 1 species is located then an effective and appropriate disturbance-free zone should be established around the nest. Disturbance-free zones are recommended by the RSPB / Forest Authority in their publication *Forests and Birds* (1997), eg for honey buzzard between 200 and 600 metres, and for crossbill 50 and 100 metres depending upon the stage in the breeding cycle. This publication also highlights other good practice which may be relevant to the New Forest

3.7.4 Generic prescriptions and rationale for New Forest Inclosure habitats

1. Where the management objective is to restore primary habitats to favourable condition and return them to Open Forest management then the following generic guidance is applicable:

A: Preliminary works to restore habitats to favourable condition:

Carry out those restoration works most easily implemented whilst the Inclosure fence remains. This is likely to include:

- removal of non-native species;

- restoration of topography and drainage channels to pre-Inclosure drainage pattern, or removal of drainage channels as appropriate;

- treatment of native species as required eg: thin broadleaf stands, manage scrub and bracken as required.

B: To complete restoration or to maintain favourable condition. This is likely to include:

- removal of fencing and restoration Open Forest management regimes.

The generic guidance for corresponding Open Forest habitat should then be followed.

2. Where the management objective is to restore primary habitats to favourable condition but to retain them within Inclosures then the following generic guidance is applicable:

A: Preliminary works to restore habitats to favourable condition. This is likely to include:

- removal of non-native species;

- restoration of topography and drainage channels to pre-Inclosure pattern, or removal of drainage channels if appropriate;

- treatment of native species as required eg: thin broadleaf stands, retain fallen and standing deadwood, manage scrub and bracken as required.

B: To complete restoration or to maintain favourable condition

- Where practicable, primary habitats trapped within Inclosures should receive at least periodic grazing by commoners stock. Options are:

  _ allow unrestricted access to commoners stock by temporarily removing Inclosure fencing or throw open gates. (Suitable where significant areas of primary habitat remains trapped within Inclosure);

  _ allow seasonal grazing for commoners stock. (Suitable where less extensive areas of primary habitat remains trapped within Inclosures).

- Where periodic grazing by commoners stock is impracticable or insufficient to maintain open habitats:

  _ implement rotational cut and burn (if possible) maintenance programmes to maintain open habitats, following generic guidance for corresponding Open Forest habitat.

  _ in these instances the priority for the 20% permanent open space should be those areas containing primary heathland habitats.

3. Where the management objective is to restore secondary habitats to favourable condition (eg restore broadleaf woodland plantations on ancient woodland sites to a semi-natural character), but to retain them within Inclosures then the following operations are likely to be required:

- Removal non-native species.

- Restoration of topography and drainage channels to pre-Inclosure pattern, or removal of drainage channels as appropriate.

- Treatment of native species as required eg: thin stands, retain fallen and standing deadwood, widen rides, manage bracken and scrub to produce structured vegetation suitable for faunal interests.

- The following grazing options should be considered on a site by site basis:

  _ Allow unrestricted access to commoners stock by temporarily removing Inclosure fencing. (Suitable where significant areas of primary habitat remains trapped within Inclosure and / or sufficient open space has been created to encourage animals to graze lightly over large areas);

  _ allow seasonal grazing for commoners stock. (Suitable where less extensive areas of primary habitat remains trapped within Inclosure and where maximum flowering is desirable);

  _ permanently exclude commoners stock. (Suitable where very little primary habitat remains and the potential for a rich flora and fauna comprising species intolerant of grazing pressure is good).

- In the absence of commoners stock grazing, rotational cutting programmes will need to be implemented to maintain 20% permanent open space in glades and rides and to create suitable conditions for woodland flora and fauna which are intolerant of grazing.

Woodland management: the precise silvicultural techniques to be adopted in each stand can be varied according to conditions and the state of the crop, provided the following principles are adopted:

- The aim is the maintenance, re-creation or restoration of a native broadleaf woodland.

- Natural regeneration is to be favoured. Failing that other techniques (eg sowing of locally collected seed or planting), can be used. Note that where regeneration fails to produce a native cover then such areas might best contribute to the 20% permanent open space.

- Removal of the overstorey should be targeted on existing areas of broadleaf regeneration.

- Some stands should be put into coppice or coppice-with-standards but these will be very limited in the Crown lands.

- Any existing veteran trees should be retained and where these are absent at least 5 trees per ha should be identified for retention through to over-maturity and natural death.

- Existing standing and fallen dead wood will be retained (subject to health and safety considerations).

- Ground disturbance during extraction and other operations should be kept to a minimum.

- Rides should be kept open and managed as permanent open space.

4. Where the management objective is to maintain a mixed cover of broadleaf and conifer within Inclosures:

Whilst such stands are generally of less significance for nature conservation and will not be subject to Condition Assessment Monitoring it is appropriate to provide the following generic guidance:

- All stands to be managed to a minimum of UK Forestry Standard.
- Natural regeneration will be favoured, but whatever species regenerate, (conifer or broadleaf) will be retained. It is likely that birch, pine and other conifer will regenerate freely on ex-heathland soils, and birch, oak and beech will regenerate more freely on richer soils. The aim will be to allow a successional progression towards a more diverse woodland with appropriate species on appropriate soils.

- Removal of the overstorey should be targeted on existing areas of broadleaf regeneration.

- Where appropriate, on species-poor uniform plantations on richer soils, some enrichment planting (of native species appropriate to the New Forest), may be used to hasten the natural progression to a more diverse character.

- Any existing veteran trees should be retained and where these are absent at least 5 trees per ha should be identified for retention through to over-maturity and natural death.

- Existing standing and fallen dead wood will be retained (subject to health and safety considerations).

- Ground disturbance during extraction and other operations should be kept to a minimum.

- Rides should be kept open and managed as permanent open space.

5. Where the management objective is to carry out commercial coniferous silviculture:

Coniferous plantations are of little significance for nature conservation, and are regarded as 'site fabric' and are not subject to condition assessment monitoring. Hence no generic guidance is provided in this Management Plan. However, management guidance is provided in *The UK Forestry Standard: the Governments approach to Sustainable Forestry* (Forestry Commission 1998).

6. Where the management objective is to maintain or restore ancient semi-natural woodland to favourable condition, on non-Crownland sites, (eg Langley Wood, Whiteparish Common), the following are likely to be required:

- Removal of non-native species.

- Restoration of appropriate hydrological regimes, through treatments or removal of inappropriate and/ or damaging drainage channels.

- Management by coppice, coppice-with-standards, high forest rotations or non-intervention depending upon site conditions, character and detailed management objectives.