Grazing in the urban environment – an economic and social appraisal of conservation grazing schemes

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Abstract

This study aims to examine the use of grazing livestock to manage urban and urban fringe sites of conservation interest. It considers in particular, the way that organisations achieve grazing and the cost-effectiveness of grazing in comparison with cutting. The latter is a method often advocated as more practical in more urban environments. In addition, the study evaluates the public perception of grazing and the added amenity value that may be associated with the use of livestock.

The current perception of grazing in the urban fringe is discussed. In particular, attention is drawn to the potential impact of expected declines in grazing and changes in agricultural land use. The issues facing managing organisations in this environment are examined.

Data were gathered from a postal questionnaire sent to 59 organisations across the United Kingdom. Detailed case studies were developed through interviews with representative organisations to illustrate different approaches to grazing in the urban environment. The public reaction towards grazing was assessed through the use of a visitor survey at Keppel's Field Local Nature Reserve, located in the urban fringe of Rotherham. The cost-effectiveness of grazing was analysed through a comparison with the widely used alternative method of management - cutting. In addition the non-marketable benefits were considered.

The study concludes that conservation grazing management is possible in the urban fringe countryside. Most organisations relied on an external source of livestock, in particular a local farmer to provide the grazing. Occasionally a specialist breeder, rare breeds centre or grazing project provided the livestock. Other organisations have gone down the route of setting up their own livestock unit to manage their sites and those of other local organisations.

The costs and benefits varied considerably depending on the approach taken. Owning stock has major capital and revenue implications for an organisation as well as additional responsibilities of animal welfare. There are the added benefits of having control over the grazing regime, type of stock and possible income generation. Capital costs and welfare responsibilities were avoided by the organisations utilising an external source of livestock.

When compared to the estimated costs for cutting the same sites, grazing is likely to be more expensive for organisations owning livestock. Grazing can be less expensive than cutting for organisations using external sources of livestock. Generally grazing became more cost-effective over longer time horizons.

Benefits in terms of increased amenity value of the conservation site were reported by most organisations, especially those owning livestock. In particular, the use of livestock perceived as attractive, like Highland cattle, can generate interest in the work of an organization and act as a positive public relations exercise. One of the benefits of managing sites within the urban environment is the close proximity of the people. Great opportunities exist to involve the population in the grazing scheme and to generate interest in conservation management more generally.

Introduction

Local Authorities, Wildlife Trusts and other conservation organisations manage urban and urban fringe sites of conservation interest across the United Kingdom. Many of these sites support vegetation communities that would ideally be best managed by grazing to create diverse opportunities for wildlife.

This research examines the practicalities of grazing such sites. This is achieved through the use of a broad survey and detailed case studies.

Aim

To investigate if conservation grazing schemes are an effective method of managing urban and urban fringe sites of conservation interest.

Objectives

- Examine the way organisations are achieving grazing and the factors affecting effective implementation.
- Examine the cost-effectiveness and suitability of grazing in comparison with the widely advocated alternative management, cutting.
- Examine the costs and benefits in relation to the amenity value of the sites, linked to the presence of grazing livestock. This is particularly relevant because of the proximity to the urban population.

Grazing as a management tool

Grazing as a conservation tool has developed over the last fifty years and now is well recognised by conservation managers, as the most appropriate and desirable management required for a wide range of types of vegetation and nature conservation interest. Grazing is vital to biodiversity in the UK (Small, Poulter, Jeffreys and Bacon, 1999; Duffey *et al.,* 1974; Crofts and Jefferson, 1994).

Grazing may be the most appropriate management for a number of reasons including the fact that many of the semi-natural habitats of conservation interest were created through the actions of grazing livestock and any decline in grazing will lead to changes within the communities and a progression towards climax woodland. Alternative methods of management may not be suited to the site or its characteristic habitat-types

and may change the physical structure of the vegetation, which in turn would impact on fauna (Crofts and Jefferson 1994; Small *et al.,* 1999).

Grazing is often cited as the best management option for grasslands because it is gradual and provides a mosaic of sward height and density of benefit to a wide range of wildlife including invertebrates and birds. In contrast cutting is more uniform and sudden causing dramatic changes in microclimate within the sward. Invertebrates that occur in traditional hay meadows often have lifecycles that fit in with the hay cutting cycles (Kirby, 1992).

Lack of grazing and its effect on vegetation

Cessation or decline of grazing on a site can lead to gradual decline in the diversity and changes in the structure of the characteristic vegetation, with the more open communities progressing towards climax vegetation through seral succession. Read (1994) documents the decline in diversity of Burnham Beeches, following the cessation of grazing in early 1900's. Similarly, Box and Bramwell (1998) report that the reduction in grazing at Sutton Park NNR has led to encroachment of scrub and secondary woodland onto once open grassland and heath. In both cases restoration of grazing is aiming to reverse the trend of seral succession.

Alternative methods of managing vegetation

Cutting

Traditionally, more neutral lowland grasslands may have been cut for hay. This is less likely for acidic and calcareous grasslands where fertility levels and yield are low (Crofts and Jefferson, 1994).

Where cutting for hay is the traditional management for a particular site the main consideration to preserve the conservation interest is the timing of the cut. This is particularly relevant to conserve annual species of flowering herb and to minimise risk to ground nesting birds (Crofts and Jefferson, 1994).

Substitution of cutting for grazing can be considered for sites where grazing is not practical. The botanical interest of such sites can often be maintained and the frequency of cutting can influence sward diversity and structure. However mowing cannot create the mosaic of sward conditions, which benefit a wider variety of invertebrate species (Kirby, 1992; Crofts and Jefferson, 1994).

Like grazing, cutting will also sustain a grassland habitat by preventing the dominance of coarse competitive grasses, herbs, scrub and trees.

Practicalities of cutting

For sites which were more likely to have been traditionally managed as pasture, cutting is not always a suitable replacement. Many sites have difficult terrain and access for normal hay cutting machinery is restricted because of topography or ground conditions. Specialist machinery has been developed by companies to tackle cutting on such sites as an alternative to grazing. However, it is difficult to replicate the diversity in sward structure produced by extensive conservation grazing and to meet the conservation aims (Small *et al.*, 1999; Bacon, 1998b).

Maintaining the wildlife interest of pastures without any grazing is difficult and this is a problem facing many conservation managers. In Epping Forest they are pioneering the use of several machines in an attempt to manage pasture. Although cutting is seen as a short-term measure to prevent further decline of the grassland areas, the re-introduction of grazing is the ultimate priority (Dagley and Thompson, 2000).

Cutting may be thought of as a suitable alternative to grazing, particularly in areas where the constraints on grazing are too great. However, the conservation objectives may be compromised. Similarly constraints imposed by the site's location or nature may limit the type of machinery and feasibility of cutting on certain sites and therefore grazing may be more appropriate on these sites.

Urbanisation of the countryside

Definition of urban and urban fringe

Urban/ urban fringe is a term applied to the area in and around our cities and towns. A wide range of terminology exists including rural-urban fringe, fringe, urban fringe, urban shadow, inner fringe, outer fringe *etc.* Much of this work emphasises the transitional nature of the countryside around towns (Herrington, 1984), with various models having been developed to illustrate the trend urban to rural (Herrington, 1984; Rotherham, 1996b).

In the context of this research *Urban* defines the inner belt of a city and may include urban parks, allotments, amenity areas and urban commons. *Urban fringe* defines the outer belt of a city where suburbs have developed but there is agricultural land, either active or changed use and may include Country Parks, woodlands, informal and formal recreation sites and nature reserves.

Increasing urbanisation and effect on the management of the countryside

Net Transfer Data from the Farm Census produced annually by Department of the Environment, Food and Rural Affairs (DEFRA), formerly MAFF are used by the UK Government as the official indicator of change in rural land. The data from 1950 to 1986 show that the change to urban, industrial and recreational use forms the great bulk of the reported loss of farmland (Sinclair, 1992).

With increasing agricultural intensification and reliance on mechanisation, areas which cannot be farmed because of their location, size, or topography have become abandoned or leased out for other uses. This may include horse grazing, often at a premium in the urban fringe. Land within the urban fringe, which is still within agricultural production, can often face pressure from the urban population which can lead to a change in farming practices and a shift away from livestock farming in particular. Urbanisation can lead to an increased demand for land and subsequent development of non-agricultural land use (Herrington, 1984; Bryant, Russwurm and Mclellan, 1982). For example, the Natural Area profiles identify the significant vegetation communities of the geographical area and the issues, which impact on these habitat-types. English Nature state that the key issues affecting the grassland resource of the Coal Measures Natural Area include; pressure from urban/industrial development and lack of grazing/mowing, overgrazing by horses, as well as pressure from agricultural intensification (English Nature, 1996).

Increasing levels of tourism and leisure activities in rural areas are placing similar pressure on typically rural countryside (Jenkins, Hall and Troughton, 1997). It is possible that rural areas are now beginning to face constraints linked to the impact of urban activities and agriculture will face similar issues in the years to come. Certainly the constraints identified within the research carried out by the *Grazing Animals Project* would support this assumption (Small *et al.,* 1999).

Urban and urban fringe countryside

Diversity of habitat-types in urban areas.

Typically in urban/urban fringe areas of our cities there is a great diversity of habitat-types, some recent and some ancient, which have undoubtedly been influenced by human activity.
Areas of once rural countryside that have become encapsulated within urban or urban fringe landscapes can often support remnant populations of flora or fauna characteristic of declining semi-natural, unimproved wildlife habitats (Rotherham, 1996c). One of the beneficial aspects of this isolation, in terms of urban biodiversity, is that these sites have often escaped the intensive agricultural practices widespread in commercial farming (Rotherham 1996a).

The value of the management of urban/fringe sites

The value of managing these sites around or in cities is not only to sustain their value to biodiversity but also to provide an opportunity for local people to participate in the conservation of a meadow or wetland and to understand the principles of traditional management. Urban countryside, be it changed and isolated from the rural countryside, has an enormous role to play in global conservation by providing town dwellers, the vast majority of the population, with a link to the wider global environment (Kendle and Forbes, 1997). This sends a clear message to the managers of the urban countryside about the priorities of management. The opportunities they can provide for involving local people in their Park, Reserve *etc* are vital (Rotherham, 1996c).

Others, like Gilbert, are critical of the level of resources targeted at the areas of relict countryside. He believes that this is not typical urban countryside. He identifies the importance of engaging local people with the role of true urban environments in UK biodiversity (Gilbert, 1989).

Fragmentation and implications for management of urban sites

Where areas of relict or encapsulated grasslands do exist, re-introduction or maintenance of traditional management would seem appropriate and can often produce tremendous benefit in terms of species diversity. Because of their location, sites are often managed inappropriately, not for their ecological but their amenity value, or they have been abandoned (Rotherham 1996a).

Management of sites which have become isolated or fragmented from the wider countryside can create resource implications for managers. The management

demands under such conditions can exceed those had a site been part of its original more rural landscape (Kendle and Forbes, 1997; Whitbread and Jenman, 1995; Morris, 1989).

Traditional grazing management may not be seen as viable either ecologically or financially, because of small size or fragmented nature of urban fringe sites and the associated difficulty of re-introducing appropriate management now that the area is no longer situated in its original context within the wider landscape. These areas are more vulnerable to destruction or neglect and grazing may be is less suitable because of the difficulty and cost of arrangement. On larger sites there is more opportunity to manage by grazing and more opportunity to create the desirable range of sward conditions (Kirby, 1995).

Management of urban sites by grazing

Grazing in the urban/urban fringe context is often dismissed as inappropriate and cutting is recommended as an alternative, without any appraisal of the benefits or disadvantages of the two methods in different situations. The principal argument against grazing in urban areas usually revolves around perceived implications for animal welfare and the additional difficulty in supervising the stock (Lincolnshire Wildlife Trust, 2000; Forum for the Application of Conservation Techniques (FACT 2), 1998; Emery, 1986). Cutting or mowing are often seen as simpler methods of managing grasslands without the aforementioned commitments to stock (Emery, 1986).

In contrast, others do consider many of the issues and possibilities involved in making a decision about management of urban/fringe or isolated lowland grasslands. They identify that the majority of grasslands are grazed or could be grazed to create the required conditions. Grazing under these conditions is not always dismissed and consideration of the possibility of re-introduction of grazing alongside other management techniques is recommended (Crofts and Jefferson, 1994).

There is little specific advice available to land managers on the possible sources of grazing stock within urban areas, although the rise in City Farms in the 1980's and increasing popularity of horses and ponies is referred to, thus alluding to a possible source of grazing livestock (Emery, 1986). However, recent initiatives through the *Grazing Animals Project* are addressing the constraints of grazing conservation sites in general and many of the constraints identified apply equally to rural and urban fringe sites (Small, *et al.,* 1999).

Press releases often promote grazing schemes within urban settings. An article in *The Guardian* promoted the management of the meadow at the Natural History Museum in London utilising sheep from a local city farm. The article announced an initiative in London: *Sustain*, which calls for more of the Parkland in London to be grazed and referred to existing urban and urban fringe grazing schemes on Corporation of London and The Royal Park Agency land (Meikle, 1999).

Availability and suitability of stock in the urban environment

Decline in agricultural land use within urban fringe environment may affect the availability of suitable livestock to graze conservation sites.

The growth of the horse population in the urban fringe may seem to be desirable by some, however the impact on semi-natural grasslands can be dramatic in relation to overgrazing, in particular the effect of trampling and development of latrine areas (Emery, 1986). This may be the case if domestic horses are used and the intensity of grazing is not managed appropriately.

Although horses are often regarded as poor graziers of reserves, on small isolated sites it may be possible to carefully manage horse grazing for conservation benefit, when the use of sheep or cattle may be impossible. This could well apply to urban settings where there is a high demand for horse or pony grazing and little availability of more desirable livestock (Kirby, 1992).

English Nature recognise the contribution that horses and ponies can make towards the conservation of meadows and pasture (English Nature, 1997).

Similarly research into the impact of horse and cattle grazing has shown that the species of grazing animal has a minor impact compared to grazing intensity. The damage associated with horse grazing is confirmed but is restricted to heavily grazed sites. Heavy grazing with cattle may cause similar amount of damage (Gibson, 1996).

Modern farming and suitability of livestock for conservation grazing

Traditional farming is a term widely used within nature conservation. It is often seen as the ultimate management for grasslands of conservation importance. Key features of traditional grazing include grassland which is not ploughed and the only fertilisers used are natural manures from the animals (Hopkins, 1990).

The change in livestock farming in the UK, in particular the type of breeds now used and the intensive nature of grazing is not suited to conservation of semi-natural habitats. Commercial breeds, which have been bred for intensive farming and are imported from continental Europe, have replaced traditional breeds (Grayson, 1997; Stoate, 1996).

Incompatibility of modern livestock breeds and requirements for conservation grazing schemes

The ecological characteristics of agricultural grasslands have changed dramatically as a result of the decline in traditional farming. Modern grasslands are composed of a few fast-growing species that are found over wide a geographical area, so floristic composition is unvaried. They are necessary to support the commercial breeds of livestock now common in the UK. It is not now economic or practical to graze remaining unimproved grasslands as part of a modern farming system and as a result the sites are abandoned or agriculturally improved (Hopkins, 1990; Alderson and Small 1997).

There is a current lack of compatibility between the objectives of modern farming and conservation and the complete loss of this link could be seen as one of the greatest threats to conservation (Hopkins, 1990; Oates, 1994). The research carried out by *Grazing Animals Project* (GAP) suggests that many site managers identified the "*need for understanding between graziers/farmers and conservation managers*" (Small et al 1999. P195) and that it has to be a two way process. The *Grazing Animals Project* is actively promoting the importance of working with local farmers and the need to address some of the problems facing modern agriculture (Small, *et al.* 1999).

This change in farming and in particular modern grazing stock impacts on conservation managers who ideally require more traditional native breeds that are better suited to grazing the vegetation characteristic of these habitat-types. Many site managers state they would prefer different breeds of stock but are constrained by availability of suitable graziers and stock (Small, *et al.* 1999).

Reliance on modern agricultural practice to provide suitable stock to graze wildlife sites is a major problem facing site managers. The stock available is not necessarily suited to the wide range of vegetation types that require grazing (Oates, 1994; Bowley, 1994).

Decline in grazing generally

The decline in the beef market in relation to the BSE legislation and the Over Thirty Months Scheme, restricting the marketing of beef cattle over this age, will it is thought have a serious impact on the future management of semi-natural habitats across the country. The number of beef cattle available for conservation grazing is likely to be affected because of the decline in profitability of such farming.

Availability of stock is not therefore only a problem for the urban / urban fringe manager. Even without the reported decline in available stock there are many other issues within the agricultural and conservation worlds that constrain effective working partnerships to ensure the conservation of the semi-natural grassland habitats in the UK (Small *et al.*, 1999; Tubbs, 1995).

The effect of changing agriculture on semi-natural vegetation.

Changes in agriculture during the last century have had a serious impact on the extent and condition of semi-natural vegetation communities across the UK. Agricultural intensification and the demand for increased agricultural productivity has led to a loss of certain lowland grassland habitats and associated wildlife interest. Cessation of grazing on marginal land because it is no longer profitable has also impacted on remaining semi-natural grasslands. This is often the case within urban fringe areas where the landscape has become fragmented by urban development (Crofts and Jefferson, 1994; Rotherham 1996a).

Use of Native Breeds of livestock for conservation grazing.

Native breeds of grazing stock are suited to semi-natural vegetation of a low nutritional value. They can sustain growth rates where the modern commercial breeds of cattle would decline rapidly and are ideally suited to grazing semi-natural vegetation (Grayson, 1997; Crofts and Jefferson, 1994). Recognition of the value of native livestock has increased within the UK, particularly because of recent events like BSE. Marketing of traditional/ rare breeds can be profitable, particularly if it is linked with schemes such as the traditional breeds meat marketing scheme set up by the Rare Breeds Survival Trust (Alderson, 1999).

Many conservation organisations are looking beyond mainstream agriculture for answers and are using native and rare breeds to graze sites under their management (Read, 1994; Oates, 1994).

A range of breed profiles for many of our native breeds of livestock have been developed in recent years (Tolhurst, 1997; Small, 1998) and a new *Grazing Animals Project* breed profile project was launched in 1999. The aim is to provide information on livestock breeds used for conservation grazing to enable site managers to identify suitable types of grazing animals for their grazing schemes (Oates, 1999).

Implementation of grazing schemes

Source of grazing livestock

Conservation organisations can be classified into two categories in terms of those which work with local farmers to supply stock and manage it and those that need to have their own stock in order to control the outcome of the grazing (Bacon, 1998).

Several conservation organisations including English Nature (formerly Nature Conservancy Council) and the Royal Society for the Protection of Birds (RSPB) are purchasing their own stock in an effort to graze sites, whereas others like the Wildfowl and Wetland Trust must depend on the more unreliable system of local graziers (Gordon & Duncan, 1988).

One of the advantages that using someone else's stock gives is reducing the burden of livestock tasks on conservation staff.

Owning its own stock allows an organisation to exert control over type of breed, number of stock and their movement which in turn would maximise the benefits to wildlife interest of sites. However, there is a cost in relation to staff time, attributed to moving and checking the animals daily, but this is qualified by the benefits (Read, 1994; Bowley, 1994).

There can also be a publicity gain for an organisation owning its own stock. This is highlighted by the enormous public and membership response the Suffolk Sandlings Project received to their sheep sponsorship appeal (Fitzgerald, 1990).

The decision on which course to follow will be dictated by legal regulations, local politics, resource availability and the level of compliance required with the conservation objectives. The schemes owning stock accept the responsibility of obtaining resources to meet the additional financial and staff costs (Bacon, 1998).

Regional grazing Schemes

Within the GAP initiative, the establishment of Regional Grazing Schemes (RGS) has been progressed as a way of overcoming many of the constraints faced by individual managers and farmers. Pilot schemes have been developed and different approaches adopted to develop collaborative grazing schemes Three systems of grazing network are put forward as models of Regional Grazing Schemes (Grayson, 1999).

- Extended Networks where a number of commercial livestock farmers provide grazing for several sites near to the farm.

- Integrated Systems where grazing is implemented by farmers who have developed a specialism in providing grazing for the purpose of conservation.

- Designated Grazing System where sites are managed by the staff of the owner using their own livestock or by animals provided under license from other sources.

Issues that were identified and need to be considered with RGS's included the need to assess the benefits in terms of outcome and cost and comparing the ecological impact of grazing against the financial performance of the system. Similarly the report identifies the importance of assessing capital and revenue costs of establishing an RGS and the more effective use of resources through collaboration with partners.

Public access in grazed areas

Public access and grazing are often seen as incompatible and issues relating to visitors or local residents are often raised as constraints to grazing schemes, both rural and urban (Small *et al.,* 1999). However this is not the case with sites like Burnham Beeches NNR, where they successfully combined grazing with public access and where managers advocate that sites with high levels of access can be grazed successfully if the needs and wishes of the visitors are carefully considered (Read & Williams, 1997).

The key issues to consider are to continue to encourage public access in grazed areas. Careful design of fencing ensures public support and concerns over the fencing can be won round once grazing is implemented, as demonstrated at Burnham Beeches and other important conservation sites (Read & Williams, 1997; Kampf, 2000).

Good public relations are required when making decisions about grassland management. This is particularly important if people are unfamiliar with why grasslands require management and are unused to grazing livestock (Crofts and Jefferson, 1994; Read & Williams, 1997).

Public reaction to grazing schemes was identified as a problem by respondents to the GAP research project. Issues varied from resistance to fencing which included cutting and vandalism to gates, public safety, to concern over the grazing animal's welfare. The suggested solutions focused on public consultation and interpretation. The often cited constraint to grazing in urban situations, worrying by dogs, was mentioned as a potential problem but in most cases it has not materialised. Good interpretation and interaction with the public were identified as solutions.

Before grazing at Burnham Beeches was re-introduced, one of the manager's major worries was what public reaction to the grazing would be. In response to the concern, leaflets and interpretative events were developed which explained why grazing was important for the site. As a result the visitors were actually looking forward to the arrival of the animals and miss them when they are not out on site (Read and Williams, 1997; Read, 1994). Grazing livestock can provide an added attraction for the urban population (Emery, 1986).

In recent years there have been several accidents involving people and cattle that resulted in death. These incidences can only fuel people's fear of livestock, particularly if they are unfamiliar with cattle and what is appropriate behaviour. The Health and Safety Executive provide advice on keeping cattle in fields with public access. They report that from April 1990 to March 1995, there were fourteen major incidents investigated. Five resulted in death. They add that there are many more incidents that are not reported or investigated (Health and Safety Executive, 1998).

Selection of type and breed of grazing stock can be critical in areas with public access and much of the work on breed profiles focuses on not only an animal's suitability to the habitat but also features like temperament. Burnham Beeches NNR has the opportunity to select its grazing stock and uses the rare breed British White cows which

were considered less intimidating to the public because they are naturally polled and are reasonably placid as a beef breed (Read, 1994).

Financial resourcing of grazing schemes.

Tolhurst (1994) states that often grazing provides a more sustainable and cost-effective approach to the management of wildlife habitats. The lowland heaths of Norfolk were managed in a very labour intensive manner using volunteers and Community Programme, implementing scrub clearance, manual mowing and raking. However it was recognised that this type of management had no long-term future in the large-scale management of heathlands and that grazing would be more viable. However often lowland heathland site managers spend a large amount of time finding resources and are often uncertain where they will be found in future years. Grazing schemes on lowland heathlands are unlikely to become self-supporting and will require a financial resource commitment (Bacon, 1998).

The rationale for the *Grazing Animals Project* suggests that grazing is the most economical long-term land management technique for sustaining semi-natural habitats and that this is in itself a strong argument to support the resolution of the constraints preventing grazing. Land Managers often have difficulty in assessing costs and profits of conservation grazing projects. Very few projects secure a profit in financial terms and more make a loss. Income or financial considerations are rarely cited as objectives in most of the conservation grazing schemes and organisations do not consider the projected profit or losses of their schemes. The opportunity exists for further investigation into the issue of profit from conservation grazing and marketing of products (Small *et al.*, 1999).

Staff time can be a significant part of running costs for organisations owning stock. At Woodwalton Fen about 100 days are spent annually with inspections and moving stock. However the alternative management option of mowing would absorb as much time. Profit is made at Woodwalton Fen from a proportion of the steers being sold each year and this profit from the sale covers the running cost of feed and vets bills and is acceptable to the auditors and secures funding in following years (Bowley, 1994).

If livestock from a third party are used then the stock costs and associated resource implications can be avoided and grazing can be cheaper than mechanical cutting. However there would be no monetary profit in relation to the investment, other than income from a grazing licence (Kampf, 2000).

Provision of additional resources to support grazing schemes would help overcome constraints of initiating new schemes and sustaining existing projects. Financial resourcing of grazing schemes is a constraint to many organisations and in the absence of financial resources, the costs and demands of a grazing scheme need to be compared to alternative methods of management. This may lead to organisations adopting "*inferior, but less resource demanding, methods than the use of grazing animals*" (Small *et al.,* 1999, p220-221).

There is an increasing reliance on the various sources of agri-environment grant aid to maintain the ephemeral grazing schemes adopted by site managers in the UK. Although there are many successful grazing schemes, there are many important sites where grazing is not being implemented or is carried out on an unsustainable *ad hoc* basis (Small *et al.,* 1999).

The Countryside Stewardship Scheme agri-environmental grant aid provides ten years of payments to landowners who manage certain types of landscape and habitat-types to enhance wildlife interest and public access to funded areas. The Scheme is administered by DEFRA, formerly MAFF. Capital payments assist in the establishment of grazing schemes and include stock fencing and provision of water supply etc.

A limitation of Countryside Stewardship Scheme (CSS) is that the payments are too low in relation to the actual cost of implementing the work. It is also considered to be targeted at conservation organisations rather than private landowners (Michael, 1994).

In order to achieve conservation objectives a livestock unit will have to compromise on profitability because pursuit of maximum profit can adversely affect the purpose of conservation management. However, conservation livestock units need not ignore their ability to maximise the potential income from the livestock and can in fact generate useful sources of income whilst achieving conservation objectives. One of the main differences in financial output between conservation grazing projects and commercial farming can be related to lower stocking rates. Although that in itself can lead to lower variable costs for feed, fertiliser, seed and vet costs. Similarly the fixed costs will vary according to the amount of labour required and need for machinery; the latter often replaces the former within intensive farming operations (Crofts and Jefferson, 1994).

There are numerous points to consider with the establishment of grazing schemes in the urban environment. The work that has been done by GAP and other individuals has contributed greatly to availability of information and advice on the constraints and benefits. In particular it provides a forum for site managers, farmers and environmental agencies to communicate and discuss ideas. This research aims to add to that information.

Methodology

A critical review of the current literature was undertaken. This focused on examples of urban grazing, research into conservation grazing, benefits of breed selection, urban fringe nature conservation, cost-effectiveness and cost benefit analysis methodology.

Information was sought from publications including *Enact, British Wildlife, English Nature Research Reports* and other publications. Other sources of information include bibliographic scientific databases, the Internet, and secondary bibliographic sources.

Methods of data collection and analysis.

To assess the practicalities and viability of implementing grazing in the urban/urban fringe environments, information was required on how organisations have implemented grazing in urban situations and the costs/benefits they identify with grazing sites of conservation interest. Information on the costs of cutting and grazing was required to allow comparison of the financial effectiveness of each method.

To enable a representative study the survey conducted needed to involve a wide range of organisations across the UK.

Finding contacts- defining sample

Articles were written and published in *Urban Wildlife News, Urban Wildlife, The Ranger Magazine* and *British Wildlife* to generate contact with relevant organisations. Contacts were also gathered through English Nature regional offices, Farming and Rural Conservation Agency (FRCA), The Wildlife Trusts and other organisations known to be grazing urban sites.

No mailing list was easily available for Local Authority Countryside Management Services and therefore telephone contact was the best option. Local Authorities with large metropolitan areas were identified through reference to the Municipal Year Book 1996. The Wildlife Trusts provided a list of all the local Trusts. A full list of the organizations contacted is shown in Appendix 1.

Personal contact was made by telephone in as many cases as possible (52%), prior to sending out the questionnaire. Follows up calls were also made to those that did not return the questionnaire within two months.

Forty-three organisations were contacted by telephone and 68% of these contacts returned the questionnaire.

Eighteen were not contacted prior to receiving the questionnaire and of those 38% returned the questionnaire.

The organisations that returned the questionnaire are listed in Appendix 2.

Data collection

The different methods of data collection were considered. Face to face or telephone interviews were considered to be impractical within the available time, distance of organisations, and financial constraints. A questionnaire mailed out to organisations was considered to be the most practical method of collecting the baseline information on all the organisations and these would be followed up by face to face interviews for selected case studies. These were selected to illustrate particular points in relation to the method of implementation of grazing.

Data collection was thus implemented using a questionnaire to provide quantitative and qualitative data. The reliability and validity of the method and the data collected was checked using pilot questionnaires and feedback from colleagues from other local authorities who are implementing grazing in urban fringe setting.

Questionnaire design

Questionnaire A (see Appendix 3) was aimed at organisations that do graze sites. It was designed to extract as much useful information about each organisation's grazing project. Moser and Kalton (1971) and Bell (1993) discuss in detail the importance of good design, piloting, distribution and return of questionnaires. Careful consideration was given to the layout and presentation and type of the questions included.

The aim of the questions was to gather information on the way organisations implement grazing in urban settings, the costs and benefits perceived. Because of the nature of the research it was necessary to include questions relating to the cost of grazing schemes. It is generally recommended that questions which require the respondent to search for information, are not included in mail questionnaires. They may

encourage the respondent to abandon the task. To avoid this, the questions requesting information on capital and annual costs were placed towards the end of the questionnaire.

A selection of question types was employed to sustain the interest of the respondent. In many cases, where factual information relating to the grazing scheme was requested a table style was used where respondents could supply information relating up to five sites. Several verbal open questions were used to draw out respondents reasoning behind breed selection and methods of monitoring the effectiveness of the grazing project. Other questions presented the respondent with a list of answers from which they could select the most relevant.

Table 1 Question format

Question number	Question area	Type of question
1	site information and grazing regime used.	table
2	breed selection	table
3	pasture/meadow management	open
4	management objectives	table
5	stock source	list
6	length of grazing scheme	list
7	historical grazing	open
8	alternative management	list
9	management planning	list
10	reason for choosing grazing over cutting	list
11	monitoring	open
12	benefits	list
13	other sites and constraints	list
14/15	capital and annual costs of grazing and cutting	table
16	income	table
17	revenue funding	yes/no
18	grant aid	open
19	public access	list
20	consultation	list
21	education	yes/no and open
22	issues related to grazing urban sites	open

An Access database was created to analyse the questionnaire and a pilot questionnaire was sent out to local organisations:
Sheffield City Council: Urban and Countryside Ranger Service
Sheffield City Council: Project Team
Yorkshire Wildlife Trust: Woodhouse Washlands Management Committee.

Feedback was sought on the layout, ease of completion, time to complete and any particular difficulties that were experienced.

Several amendments were made following the pilot, particularly in relation to the gathering of financial information and the type of question used to extract information. Also several instructions were made clearer.

A second questionnaire (B), see Appendix 3, was developed for organisations which are not currently grazing sites but would like to.

The questionnaires were mailed to organisations that had been contacted by telephone. The sample was made up of the following range of organisations:

Local Authorities: 34
Wildlife Trusts: 9
Royal Parks: 1
Corporation of London: 1
Private graziers: 5
Private utility company: 1
RSPB: 1
University: 1
Partnerships: 3
English Nature: 3

Total: 59

The response to mail questionnaires is often poor (Bell 1993). To overcome this constraint a covering letter explaining the research project and the support of *Rotherham Metropolitan Borough Council* and Sheffield Hallam University, was included together with a contact number if there were any queries.

Contact was made with forty-three of the organisations in advance of receiving the questionnaire. A record was kept of the date of distribution and return, eleven of the organisations were contacted by telephone again to encourage a response.

Thirty-three organisations returned completed questionnaires, two of which were Questionnaire B. Three organisations replied by letter saying their projects did not fit.

Analysis of responses to the questionnaire

Responses to Questionnaire A were entered into an Access Database and analysed. Tables and figures present the necessary information and inspection of these enable financial appraisal and analysis. Statistical analysis was performed to confirm the significance of responses to certain questions. In these cases chi-square test was used as a measure of association.

The principles of cost-effectiveness analysis and cost-benefit analysis (HMSO,1991) were applied to the data. In addition the principle of cost benefit analysis was used to illustrate the benefits which are non-marketed.

To assess the effectiveness of management, definition of management objectives is required. In this instance these are defined by the response of the sampled organisations to Question five, and are as follows:

- To enhance diversity and wildlife interest
- Restoration of vegetation and vegetation structure
- To provide habitat conditions for other desirable species.
- To control scrub and other invasive species
- To provide a public attraction
- To provide an income

The main management options considered were grazing and cutting

The costs and benefits covered by this Appraisal include:

- Initial capital cost
- Operating costs over the period
- Income, including grant aid
- Descriptions of those costs or benefits which cannot be easily valued in monetary terms.

The concept of the Planning Balance Sheet (Lichfield,1960; Lichfield, 1970) is applied to demonstrate the latter point.

Examination of the cost-effectiveness of management and alternative methods in this way is also in accordance with the principles of Best Value (DETR 2000). Section 4 of the Local Government Act 1999 gave the power to the Secretary of the State to specify

performance indicators and standards to promote improvement in the way in which functions are exercised having a regard to a combination of economy, efficiency and effectiveness. These terms are defined as:

Economy: acquiring human or material resources of the appropriate quality and quantity at the lowest cost (Cost-Benefit analysis);

Efficiency: producing the maximum output for any given set of resource inputs or using minimum inputs for the required quantity and quality of service provided (Cost-Benefit analysis);

Effectiveness: having the organisation meet the citizen's requirements and having a programme or activity achieve its established goals or intended aims (conservation grazing objectives listed above);

Comparisons between costs and income (including grant aid) for grazing and cutting were developed for varying time horizons (5,7 and 10 Years) to illustrate the long-term estimated cost of managing the sites by each method. The life span of both machinery and materials for fencing will vary according to quality of the material/machine, the usage and maintenance, quality of workmanship, site conditions. By examining the total costs over the three different time periods the effect of life span can be compared. The figures supplied by the site managers were discounted back to present day values using a 6% discount rate, the standard government/public sector rate. (HMSO, 1991).

It was assumed that the capital works were relevant to the first year only and therefore these were not discounted. Inflation was not taken into account.

The estimated costs of grazing and cutting provided by organisations (discounted back to present day using a 6% discount rate), were also compared to standard contract cost for hay cutting. These comparative costs were taken from the Agro Business Consultants,1999 and the *Farmers Weekly*, June 1999, contractor rate guide. The cutting costs estimated by site managers were also provided in 1999, allowing for accurate comparison, to provide an indication of the accuracy of the estimates and also what effect site constraints could have on cost.

Case Studies

Case Studies were selected to provide detailed examples of the range of urban/urban fringe grazing schemes.
Purpose:

- To illustrate and expand upon points of relevance.
- To examine in more detail specific examples of grazing in the urban fringe and organisations implementing it.
- Case studies need to be representative and qualitative.

The organisations were selected according to pre-determined criteria:
contrasting approaches, in particular the source of livestock, type of habitat and site status. The sites must be urban/urban fringe in location and be representative of the overall geographical distribution of the respondents. Selections were made only from organisations that provided cost information.

Organisations fitting criteria:

Own stock

Rotherham Metropolitan Borough Council – large stock unit, established for 10 years, range of sites, LNR's.

Hampshire County Council – coastal, LNR, SSSI, link with regional grazing Schemes.

Cannock Chase Council - recently started, Dexter cattle, LNR, SBI.

Other Stock

Exeter City Council- LNRs, SINCs, cattle no particular breed.

Sutton Park, NNR, English Nature, very urban, continental cattle, Exmoor ponies - farmer and own stock.

Portsdown Hill Countryside Service, Portsmouth City Council, rare breed centre.

The case studies were limited to four because of the travel time and the time involved in interviewing the site manager. Selection from the above six organisations was made

to illustrate particular points including; the geographical range of sampled organisations, urban nature of sites and constraints raised, availability of livestock, use of traditional breeds as opposed to commercial breeds, comparative costs for cutting these particular sites and particular representative constraints.

Rotherham Metropolitan Borough Council and Hampshire County Council were selected to represent the organisations owning stock. They presented contrasting approaches. Rotherham has a well established, large stock unit and grazes many sites both authority owned and those of outside conservation organisations. Hampshire in contrast owns a small number of stock and the resources to manage this are much lower. The aims are to provide conservation grazing, there are no plans to breed from or sell stock.

Exeter City Council was selected to represent the organisations using an outside source of stock, in this case local farmers. The schemes illustrate the advantages and constraints of using an external grazier. Similarly Birmingham City Council manage Sutton Park, an urban NNR, which relies heavily on local farmers to provide grazing, although they have recently purchased Exmoor Ponies to graze an isolated area of the site. This case study illustrates the issues in relation to heavy public use, central urban position, together with constraints the site poses on alternative management methods.

Planning and conducting interviews

Interviewing can be a subjective technique vulnerable to bias. It is advisable to undertake careful preparation to maximise information gathered from an interview and a good interview will provide in depth information to add to the questionnaire (Bell, 1993).

In each case study interview the site manager who completed the questionnaire was interviewed. Topics were selected for each case study, based on the initial response to the postal questionnaire. Clarification on points was sought if necessary. The interview was structured in that a list of questions and topics for discussion were developed for each case study, see Appendix 4. Prompting was required occasionally to explain the context of a question. Notes were taken and written up.

Visitor survey

The aim of carrying out the visitor survey was to identify if there was any amenity value added to the site over and above existing recreational value, with the introduction of grazing livestock. In particular the survey aimed to identify the level of interest/ objections generated by the re-introduction of grazing to this site after several decades of no management. Opportunities exist for further, more extensive investigation into this area.

The visitor survey was carried out at Keppel's Field Local Nature Reserve, Kimberworth, Rotherham. The site illustrates a range of issues in relation to urban fringe conservation grazing schemes and has been grazed with Highland cattle for three years.

- Overlooked by housing on two boundaries.
- The grazing is zoned across the field.
- Used by local people for informal recreation.

Questions were designed to examine visitors' perception of the management of the site and how they have been informed. In particular their views on the cattle grazing were sought and the effect this had on their level of enjoyment and interest in the management and site in general. Information on the effect that the presence of the cattle/ fencing has on the behaviour of visitors in the way they use the site was also collected.

The questionnaire was piloted on site and amendments were made to clarify the question and to ease data collection and analysis. Certain questions were re-worded and the type of question altered from open to a list format to ease analysis.

The information collected was entered into an Access database and analysed and presented using Excel.

Selection of survey dates

Survey days (see Table 2) were selected to include weekdays, weekends, bank holidays, days within and outside school holidays, days throughout the year (Moser & Kalton, 1971).

Table 2 Visitor Survey Dates Completed

Date	Type	Period	Time	Completed	Repeats
21/1/99	Pilot/site	Thursday	11.30-3.30	10	
1/2/99	Local householders			5	
27/10/99	Site	Autumn School half term	1-4pm	9	
25/11/99	Site	Winter Weekday morning	9-12am	8	2
9/1/00	Site	Winter weekend	11.30-3pm	7	3
1/2/00	Site	Lunchtime	12.20-13.20	1	2
8/5/00	Site	Spring Weekday Afternoon	2-4pm	4	
9/6/00	Site	Summer Weekend Afternoon	2-4pm	2	3
22/8/00	Site	Weekday	2-4pm	1	2
17/9/00	Site	Summer Weekend Morning	9.30-12.30	8	1
21/10/00	Site	Weekend	2-4pm	5	2
			total	60	15

The survey was conducted through site based interviews. Consideration was given to the use of self-administered questionnaires. However this was considered inappropriate because of the size of the local population and the chances of a low response rate. On-site surveys ensure that users are contacted and a high response rate obtained. The same interviewer was used throughout the survey, limiting bias (Bell, 1993).

A record was kept of the number of repeats and any non-respondents, but these were not included in the analysis. The survey was conducted from the main entrance points to the site. Respondents were selected on the next to pass basis.(Spon, 1983).

Analysis

Completed questionnaires were entered into an Access database and the data interrogated and presented using Excel.

Results

A total of 59 organisations around the UK received Questionnaire A or B (Appendix 1). Thirty-two organisations (53%) took part in the survey, completing Questionnaire A; for managers who implement grazing on the urban sites they manage (Appendix 2). Only two organisations, The Heathland Partnership and Stafford Borough Council, completed Questionnaire B for site managers who are not currently grazing. See Appendix 2 for list of responding organisations and sites.

Three organisations contacted replied by letter, stating that their schemes did not seem applicable to the research being carried out.

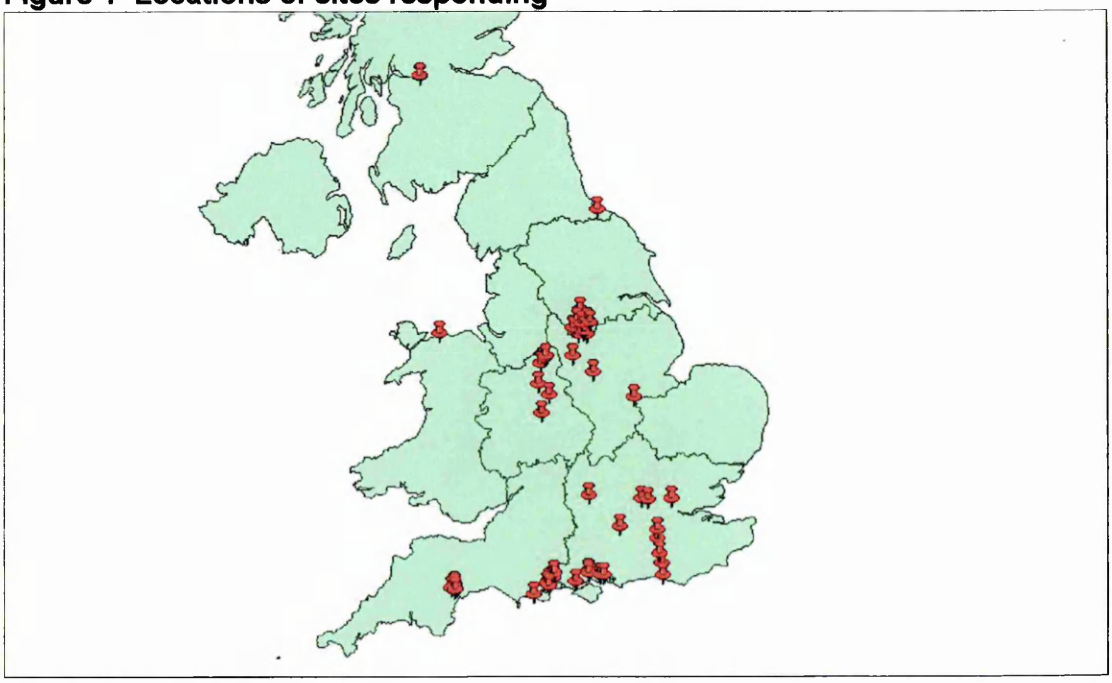
In total there was a 60% response rate to the survey, with 55% completing a questionnaire.

Overall, there was information from 31 organisations about 64 sites across the UK.

Site Descriptions

The managing organisation and their site names are shown in Appendix 1.
The locations of the sites sampled is illustrated in Figure 1

Figure 1 Locations of sites responding



Managing organisations

The 64 sites sampled were owned and managed by a range of Local Authorities, Wildlife Trusts and Conservation Agencies.

Table 3 Managing organisations

Managing Organisation	No.	Number of sites	% of organisations
Local Authority- CMS	22	52	71
County Wildlife Trusts	6	7	20
Royal Parks	1	1	3
Community farm	1	2	3
University	1	2	3

Half the organisations grazed only one urban/ fringe site, a quarter grazed two, and the remaining organisations grazed either three or five sites.

Status of Sites

Table 4 Status of sampled sites

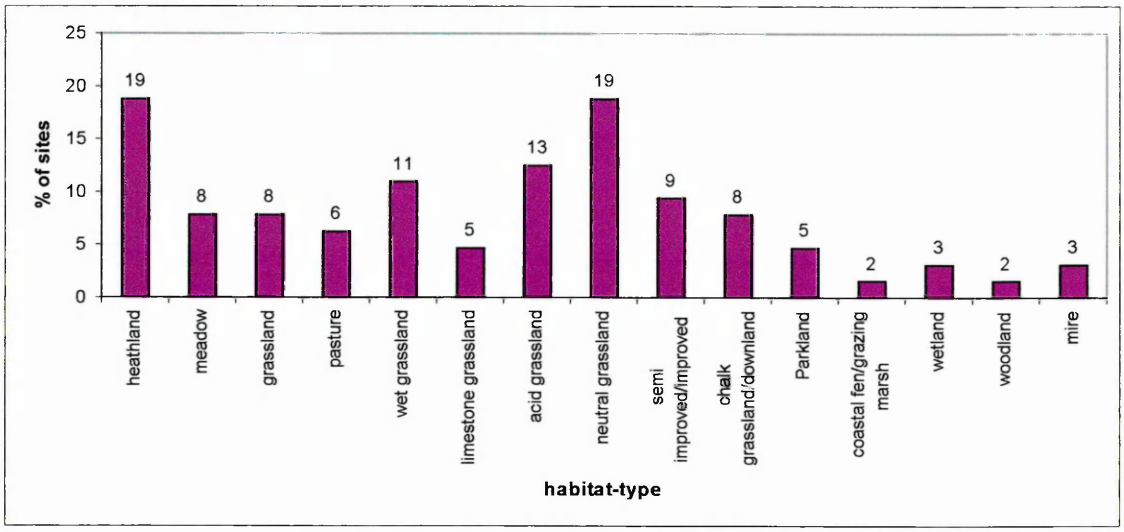
	NNR	SSSI	SSI	LNR	SINC	SNCI	pSAC	SAC	pSPA
No. of sites	3	23	8	23	7	6	2	1	1

NNR	National Nature Reserve
SSSI	Site of Special Scientific Interest
SSI	Site of Scientific Interest
LNR	Local Nature Reserve
SINC	Site of Interest for Nature Conservation
SNCI	Site of Nature Conservation Interest
PSAC	proposed Special Area of Concern
SAC	Special Area of Concern
PSPA	proposed Special Protected Area.

22 of these sites had more than one designation. Thirteen sites had no statutory designation.

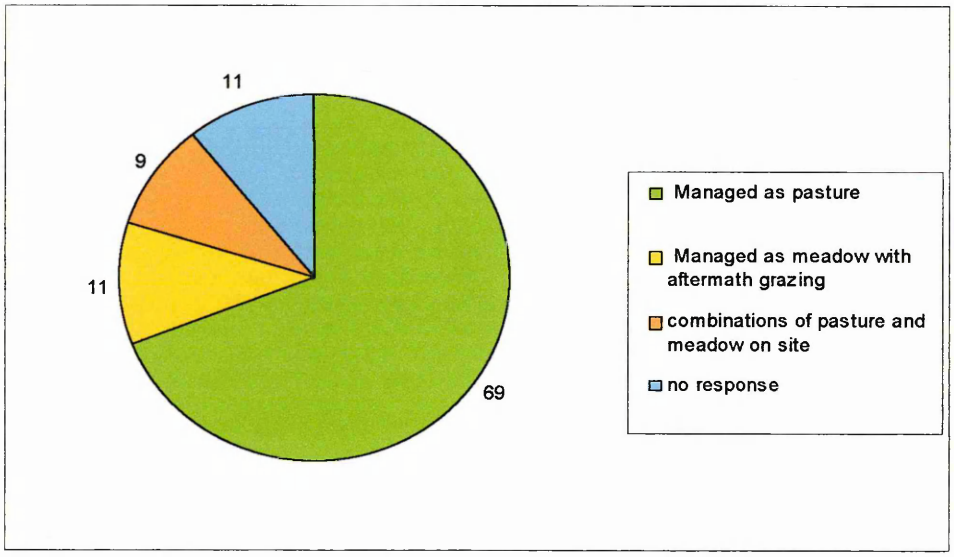
Habitat-types grazed

Figure 2 Range of habitat-types and plant communities grazed



A broad range of habitat-types are being grazed in the urban/urban fringe environment. Several sites supported more than one type of vegetation community.

Figure 3 Classification of sites by management technique.



The great majority of sites were classified as pasture (69%), with similar numbers classified as meadow with aftermath grazing (11%) and combination of pasture and meadow (9%). The remaining 11% of the sites were not classified.

Table 5 illustrates the comparison between the habitat-type and whether it was classified as pasture, meadow or meadow with aftermath grazing.

Table 5 Relationship of habitat-type to management method

		Heathland	Meadow	Grassland	Pasture	Wet grassland	Limestone grassland	Acid grassland	Neutral grassland	Semi improved /improved grassland	Chalk grassland	Parkland	Coastal fen/grazing marsh	Wetland	Woodland	Mire
Pasture	**No of sites**	7	7	6	4	6	3	6	8	5	5	3	2	2	1	1
	% of habitat-type	58	57	75	100	75	100	75	67	100	100	75	100	100	100	100
Meadow ungrazed	No of sites								3			1	1			
	% of habitat-type								25			33	100			
meadow aftermath grazed	No of sites		2	1		2		2	4							
	% of habitat-type		29	13		25		25	33							

All the heathland, limestone grassland, chalk grassland, semi-improved/improved grassland, pasture, wetland, woodland and mire were classified as pasture. Eleven grassland sites were managed as meadow with aftermath grazing. Four sites in addition to pasture or aftermath meadow had part of the site managed as an ungrazed meadow.

Only 58% of heathlands were given a land use classification. In the case of other habitat-types, where the total is greater than 100%, more than one land management technique was used on a single site.

Range of Stock used to graze sites surveyed

In total 25 different stock types were recorded. 25% of the sites were grazed by cattle, with no breed identified. In addition a further 5% stated they utilised beef cattle. Nine breeds of cattle were identified.

Table 6 Type and breed of stock utilized

Stock Type	No of sites grazed	% of total sites.
Cattle	16	24
Highland	13	19
Shorthorn	5	7
Beef cattle	3	4
Longhorn	3	4
North Devon Reds	2	3
Hereford	2	3
Dexter	2	3
Friesian/Hereford cross	1	1
Angus	1	1
Park	1	1
Continental	1	1
Sheep	12	18
Welsh Black	1	1
Southdowns	1	1
Jacob	1	1
Balwen	1	1
Hebrideen	1	1
Ponies	6	9
New Forest Ponies	3	4
Exmoor Ponies	1	1
Red Deer	2	3
Fallow Deer	2	3
Pigs	1	1
Goats	1	1

50 of the 64 sites sampled were managed by cattle grazing. Seventeen sites were managed by sheep grazing and ten by pony grazing. Deer graze four sites whilst two sites were grazed by goats and pigs. Eleven of these sites, see Table 7, had more than one type of grazing livestock, therefore the total % exceeds 100.

Table 7 Combinations of grazing stock utilised on some sites

Combination	No. of sites
Friesian/ Hereford X and Highland Cattle	1
Highland Cattle and New Forest Ponies	1
Highland and Angus Cattle	1
Highland Cattle and sheep	2
Cattle and Sheep	2
Highland and other Cattle	1
Southdowns and Jacob	1
Hereford cattle and Balwen sheep and Welsh Black cattle	1
Red Deer and Fallow Deer	1

Source of stock utilised by Organisations.

The organisations responding implement grazing using stock from a variety of sources. Four organisations (13%) both own their own stock and utilise other sources of stock to graze different sites. For example, Sheffield City Council grazes two sites with their own stock and three sites with farmers' stock. Similarly Birmingham City Council graze one site with their Exmoor Ponies and another with farmer's cattle.

Table 8 Source of grazing stock

	No. of sites	% of sites
Own stock	17	26
Local farmer	36	56
Local grazier/enthusiast	2	3
Grazing project	3	5
Rare breeds centre	3	5
Commoner	1	2
Own stock and local farmer	2	3

The majority of the sites are grazed by either the organisations own stock (26%) or a local farmer (56%).

Remaining organisations utilize opportunities including Rare Breed Centres, local enthusiasts owning rare breeds and one organization's grazing is managed by a Regional Grazing Project.

One of three sites managed by Staffordshire Moorlands District Council site is grazed by a Commoner, their other sites are grazed by a local farmer.

Reasons for selecting stock type

When questioned on the reason for selection of breed/type of stock the organisations identified 16 factors influencing their choice of stock to graze the sites sampled, which included breed characteristics, temperament, suited to the site, habitat or vegetation, popular with people, vandal/dog proof.

The results were examined in relation to the source of stock to assess whether this affected the reasons given.

For organisations owning their own stock, selection was based more on breed characteristics such as hardiness, appearance, temperament and if the stock are a rare breed or traditional breed to the site/region. 15% of these organisations selected stock breeds because they were popular with people. Only one organisation stated that the type/breed of stock was the only available stock for one site.

In comparison those organisations using a local farmer's stock to graze their sites stated that for 60% of these sites, there was no choice of stock possible. Those that were able to select stock based their choice on breed characteristics such as hardiness and their suitability to the vegetation.

The reasons given for selection of type of grazing stock for those using their own stock or external source were analysed using the *chi*-square test. The value of *chi*-square of was found to be significant at the 0.001 level (*chi*-square = 49.705, df=13), and it was concluded that the selection of grazing stock is affected by the source of grazing stock. Significantly different reasons were given by those organisations utilising the different sources of grazing animals.

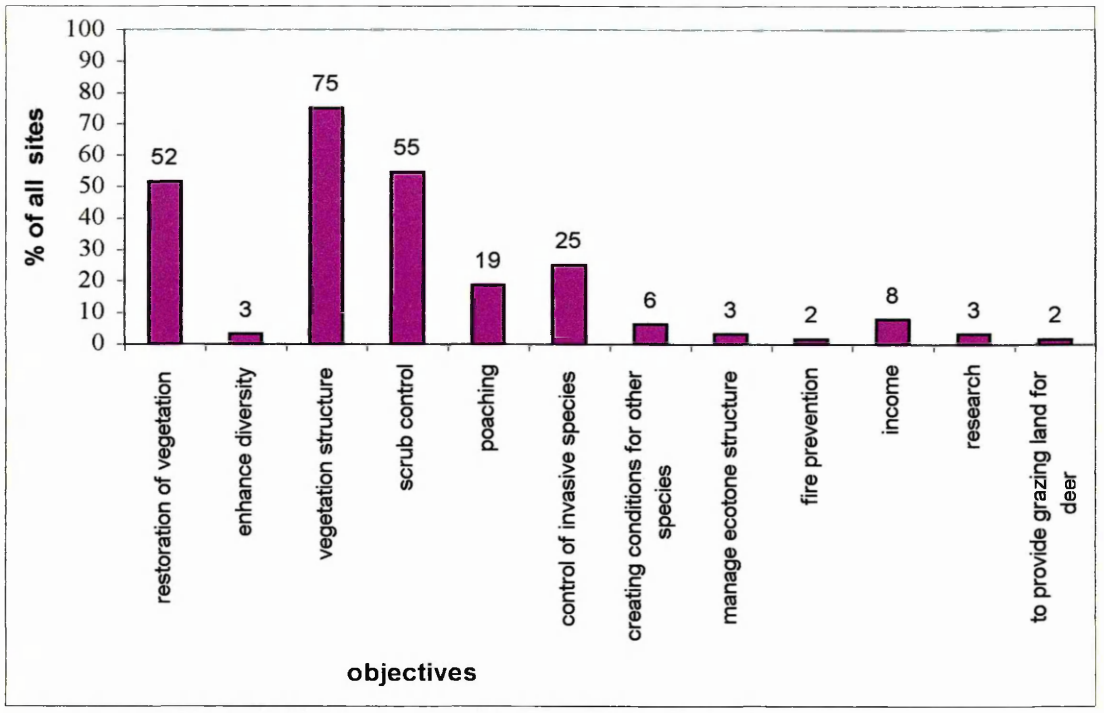
Table 9 Relationship between source of stock and choice of type and breed of stock utilised.

Source of Stock		no choice/control possible	no preference	only available stock	docile/manageable	wild nature	best suited to urban setting	popular with local people	dog proof	vandal/poach proof	suited to vegetation/habitat	suited to site conditions	hardy	tough mouthed	traditional breed/historical	rare breed	attractive
Own stock	**no. of sites**	0	0	1	4	1	0	3	1	3	2	2	4	11	5	6	7
	% of sites	0	0	5	20	5	0	15	5	15	11	11	20	55	25	30	35
Farmers stock	**no. of sites**	12	1	17	0	1	1	0	3	0	5	2	6	6	1	3	3
	% of sites	25	3	35	0	2	2	0	6	0	10	4	13	13	2	6	6

Objectives of Grazing Management

The organisations sampled were asked what their objectives were for grazing the sites under their management. The most frequently stated objectives of grazing were to restore the vegetation (52%), sustain the vegetation structure (75%) and scrub control (55%). Other objectives related to the vegetation management include the provision of bare ground by poaching (19%), the control of invasive species (25%). Several organisations graze their sites to provide conditions suitable for specific species of bird, invertebrates and in one case bats, where the dung of the cattle and associated invertebrate fauna provide food source for Long-eared Bats (Plecotus auritus).

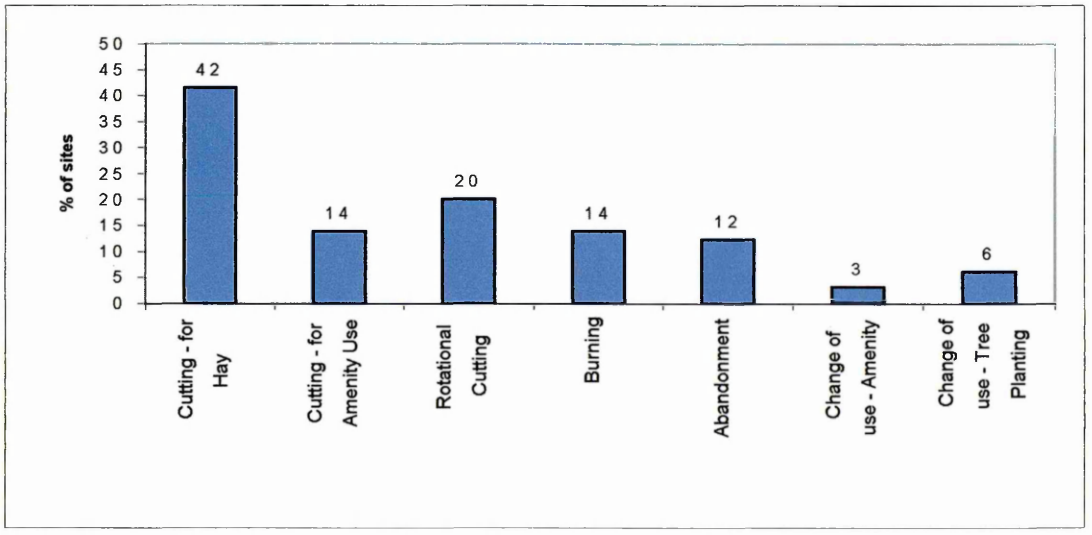
Figure 4 Objectives of grazing management.



Alternative methods of management considered

60% of the organisations had considered other methods of managing the sites; cutting for hay was considered for 42% of the sites and introduction of rotational cutting was considered for 20%. Cutting for amenity/ recreational use was considered for 14% of the sites. Abandonment/ non-intervention was an alternative for 12% and only 6% of the sites were considered for tree planting.

Figure 5 Alternative methods to grazing that were considered for the sites



Period of grazing

Table 10 Length of time the sites have been grazed.

	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6-10 Yrs	Historically grazed.
No. of sites	13	7	6	2	6	27	54
% of sites	20	11	9	3	9	42	84

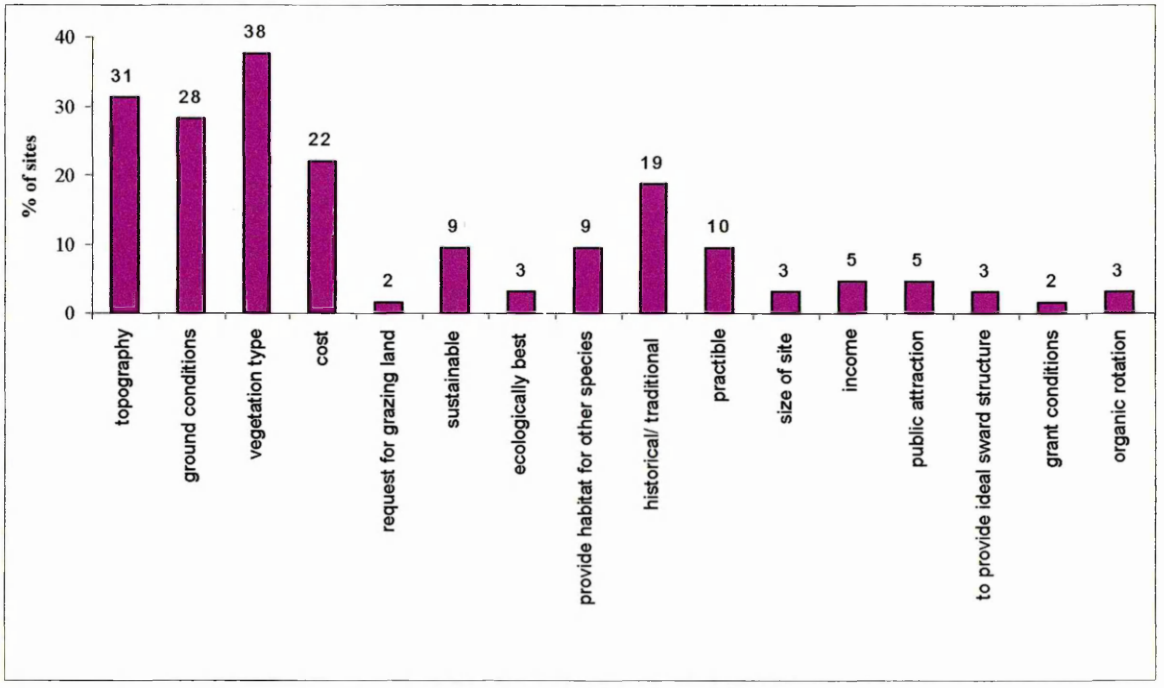
Three sites did not record the period of grazing.

In total 84% of the sites surveyed have had a history of grazing. Two sites have been grazed continuously - Sutton Park and Wollaton Park. 52% of the current grazing schemes have been in operation for upto five years.

Reasons for selecting grazing

70% of all the sites had management plans prepared by the managing organisations. When asked why they decided upon grazing the sites instead of cutting, as the most appropriate management there were sixteen reasons given. The most common reasons were the type of vegetation (38% sites), the topography of the site (31%), the ground conditions (28%), the cost (22%) and the maintenance of traditional/historical management technique (19%).

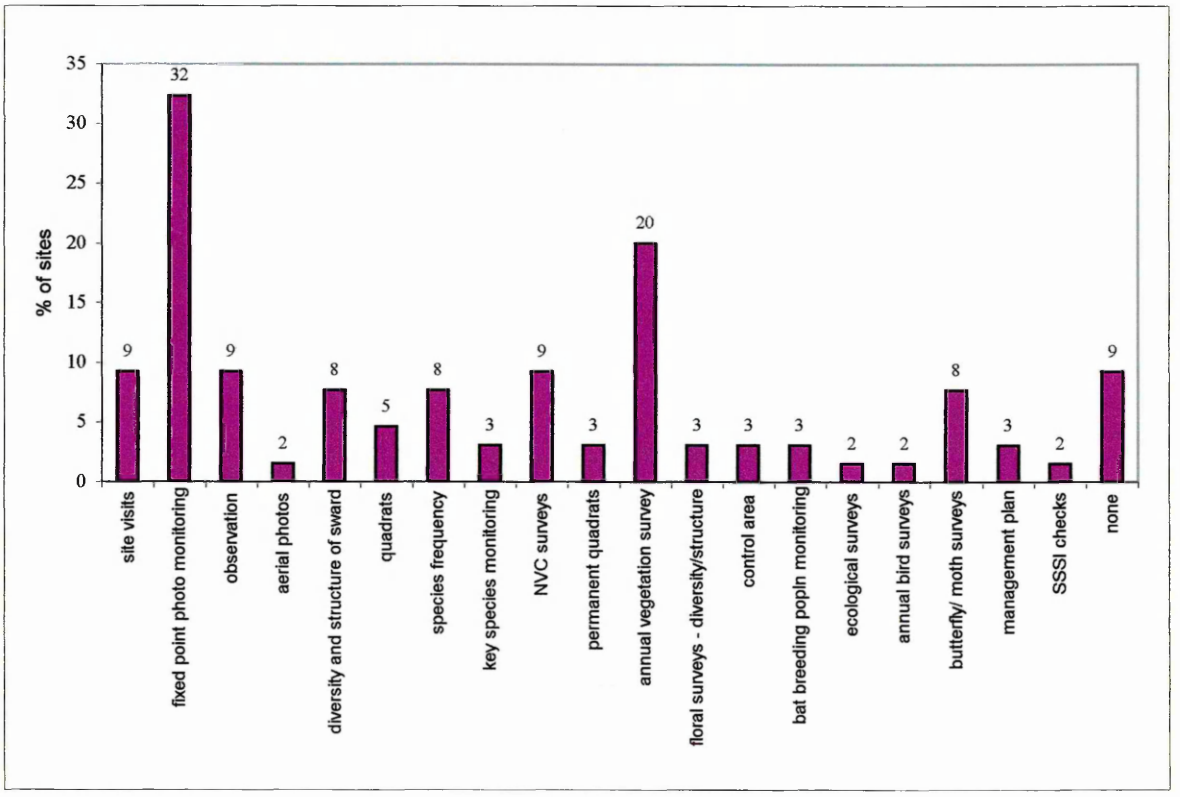
Figure 6 Reasons for selecting grazing instead of cutting.



Monitoring

Organisations were asked what methods of monitoring they used to measure the effectiveness of the grazing management. Many of the sites were monitored by more than one method.

Figure 7 Monitoring procedure



A wide range of monitoring is carried out on the sites, principally fixed point photography, vegetation surveys and specific species populations.

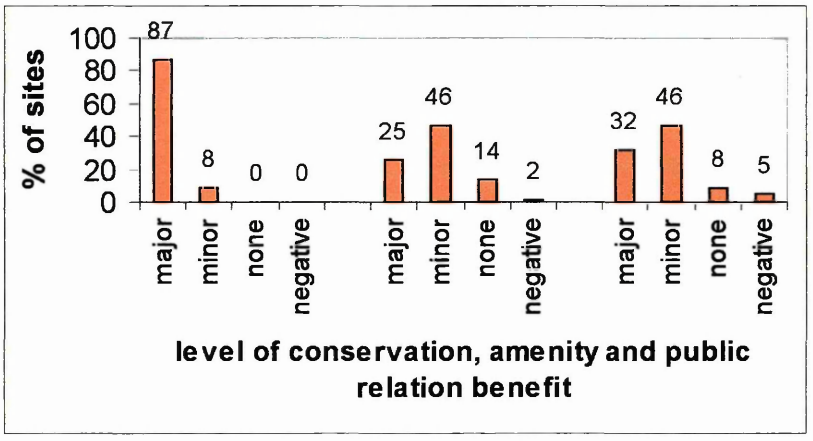
Benefits to the sites from grazing

95% of the sites had completed either all or part of the requested sections. 5% chose not to respond. Of those that did respond :
95% of the sites completed the benefit to the conservation of habitat-type
87% completed the benefit to amenity value of the site
91% completed the benefit to public relations of the organisation.

Organisations reported that grazing was of major benefit to the conservation of the habitat in 87% of cases, with the remaining sites gaining minor benefit. The amenity value of the sites benefited in a major or minor way from grazing for 71%. For 14% of the sites there was no benefit and 2% of the sites recorded a negative effect. Public

relations improved for 78% of the sites as a result of grazing. In 5% of sites there was a negative effect on public relations.

Figure 8 Estimated level of benefits/cost of grazing.



Grazing had major benefit to the conservation of the habitat, amenity value of the sites and public relations. In only a few incidences a negative impact was reported in terms of amenity value and public relations.

Influence of source of stock on the perceived benefits.

The results were analysed to assess whether the source of stock influenced the perceived benefits.

Table 11 The effect of the source of grazing stock on the perceived level of benefits.

Benefit		*Own stock*	*Own and local farmer*	*Local farmer*	*Rare breeds centre*	*Grazing Project*
conservation	Major Minor None Negative	86 6	100	84 11	100	100
Amenity value	Major Minor None Negative	50 31	50	11 57 16 3	100	100
Public relations	Major Minor None Negative	63 31	50 50	14 51 14 8	100	100

The source of stock has an influence on the benefits, particularly to the amenity value and public relations. The different level of benefit/cost to the conservation value,

amenity value of the sites and public relations of the organisations were analysed for those using their own stock or an external source of grazing stock, using the *chi*-square test.

For conservation value the value of *chi*-square was found not to be significant (*chi*-square =.2525, df =1) and it was concluded that the level of benefit to the conservation of the site did not vary significantly according to the source of stock.

The value of *chi*-square was found to be significant at the 0.01 level (*chi*-square =13.4064, df = 3) for amenity value, and at the 0.05 level (*chi*-square =10.117, df = 3) for public relations. It was concluded that the level of benefit to the amenity value of the sites and public relations of the organisations varied significantly according to the source of stock use.

More of the organisations owning their own stock state they have positive benefits to the amenity value of the site (81%) than of those using a local farmers stock (68%). Similarly 94% of the organisations using their own stock state that grazing the sites has had a major or minor benefit to their public relations, as opposed to 65% of those using a farmers stock. All the organisations perceived a major or minor benefit to the conservation of the habitat from grazing regardless of the source of the stock. The negative impacts are only associated with the latter.

Constraints

Organisations were asked if they managed other sites where grazing would be the most appropriate method of management for the type of vegetation but they are constrained by other factors. 82% of them replied that they did have such sites and identified the following constraints preventing them from implementing grazing.

Table 12 Constraints preventing the grazing of additional sites.

Constraint	No of organisations	% of organisations
Legal restrictions	2	6
Common Land	6	19
Availability of stock	11	34
Supervision of stock	17	53
Suitability of available stock	8	26
Animal welfare concerns	11	34
Cost	9	28
Proximity to housing	8	25
Level of public access	15	47
Conflict with users	14	44
Vandalism	13	41
Size of reserve	3	9
Inadequate fencing	1	3
Water availability	1	3
Staff resources	1	3
Local councillors	1	3

Figure 9 Constraints restricting additional grazing.

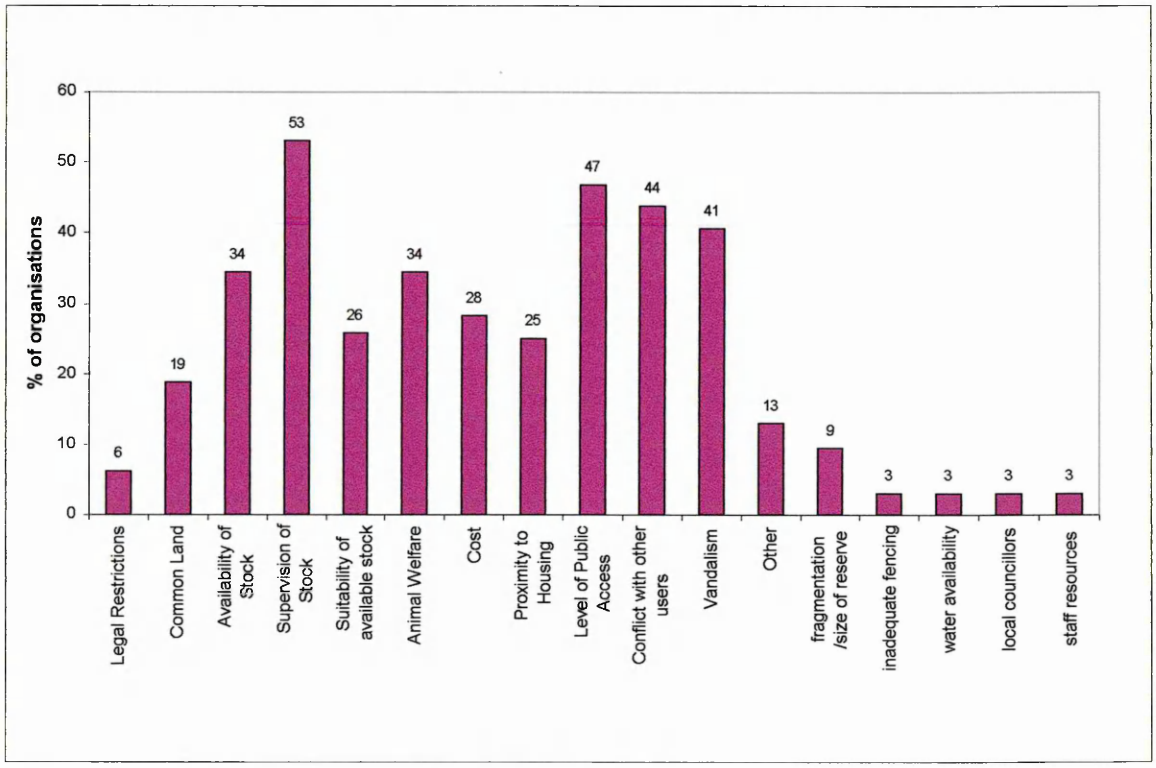
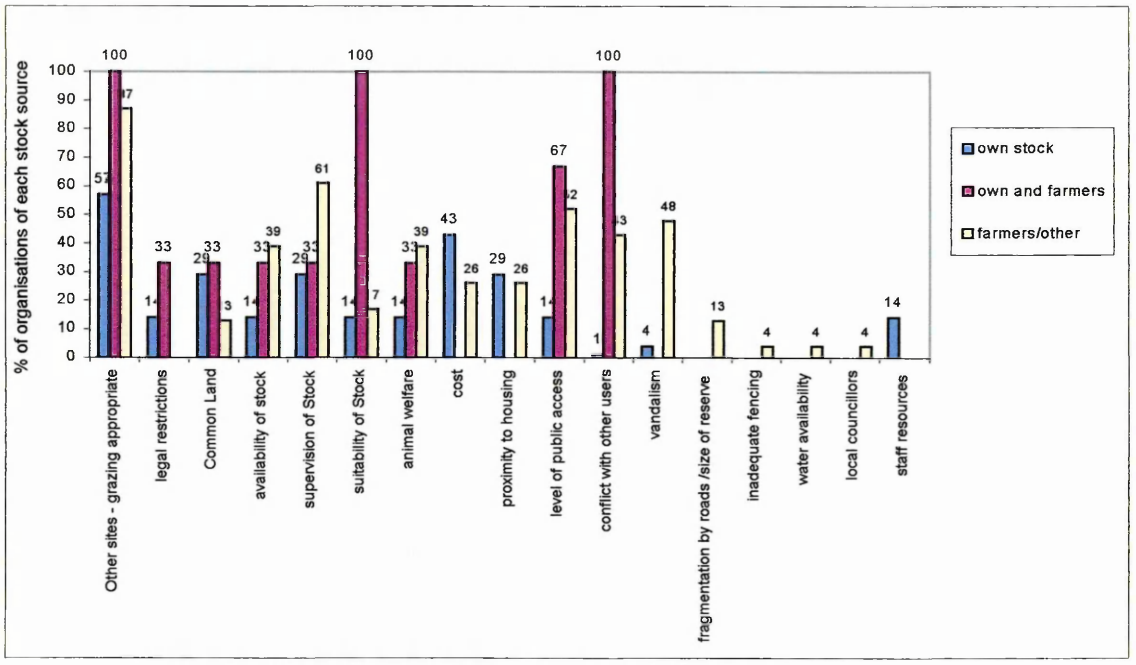


Figure 10 shows the relationship between the source of stock and perceived constraints to grazing additional sites. The percentages are expressed as the percentage of organisations within each stock source category.

Figure 10 The influence of source of existing stock on the perceived constraints

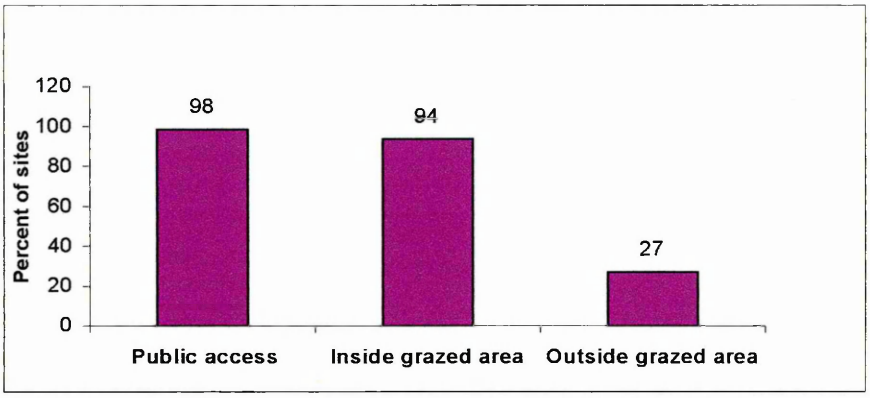


For those organisations with their own stock, cost was seen as the biggest constraint (43%) and linked with this; staff resources were of concern for 14%. Issues such as supervision of stock, proximity to housing, level of public use and suitability of stock were of concern for 14-29% of these organisations. Restrictions on grazing associated with Common Land and associated legal restrictions were also seen as a constraint.

For some organisations that use a combination of their own stock and other sources of stock to graze one or more sites, the main issues raised were suitability of stock, conflict with other users and level of public use.

Constraints identified by organisations relying on outside sources of stock were supervision of stock (61%), level of public use (52%), vandalism (48%) and conflict with other users (43%), Animal welfare was an issue for over a third of these organisations. Availability of stock was more of a constraint for these organisations than for the other categories of stock source, as was stock supervision and animal welfare. Cost was also an issue for 26% of the organisations using an outside source of stock.

Figure 11 Visitor access on grazed sites

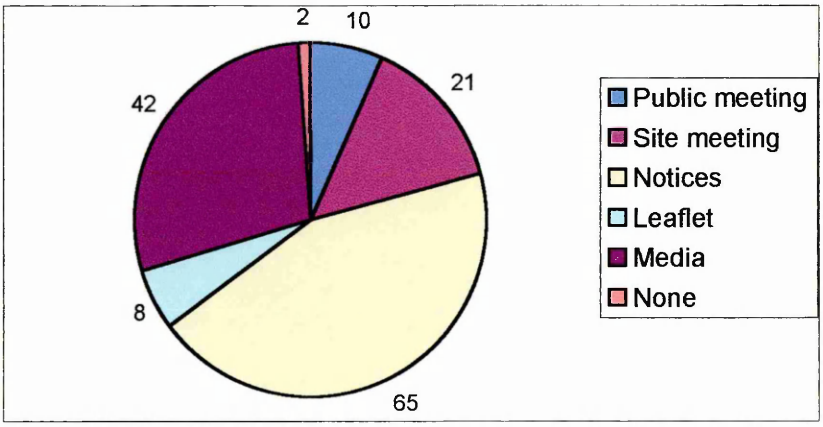


98 % of the sites surveyed have public access, with 94% having access through the grazed area and in 27% of the sites outside the grazed area also.

Public Consultation

Public consultation was carried out on 58% of the sites prior to the introduction of grazing. Most sites had more than one approach to informing visitors of the intention to graze, 65% of the sites where consultation was implemented used notices, 42% used the media. Only 21% of survey participants held a site meeting for local people. Only 10% of the sites had an indoor public meeting.

Figure 12 Methods of public consultation implemented for the sites



Actual Issues encountered

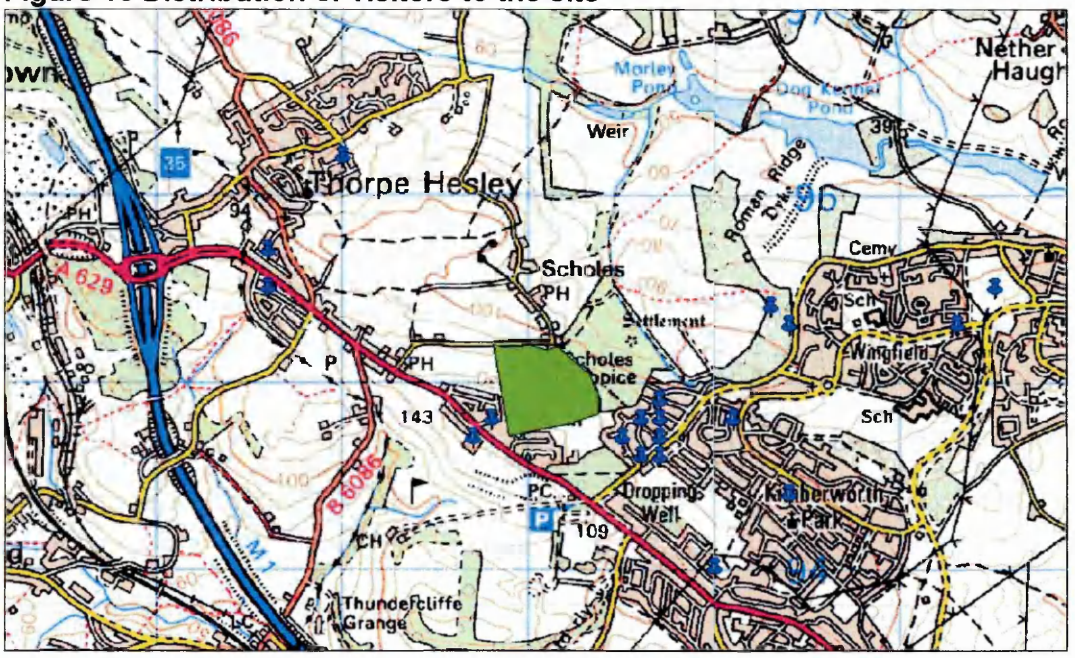
Table 13 Issues raised in relation to the grazing schemes

Issue raised	*Number of organisations*	*% of organisations*
Vandalism of fencing.	6	19
Animal welfare risk of attack from other users/vandals /airguns/motorbikes	3	10
Use of local volunteers to patrol the site Influence of other regular dog walkers to reduce vandalism and worrying of stock.	3	10
Opposition from dog walkers and related issues- they were perceived in advance though.	2	6
Dog walkers fear of stock (bulls)	2	6
Cost of grazing project	2	6
Stock worrying by dogs	2	6
Grazing can work with good public relations with local community, volunteer warden schemes etc.	1	3
Animals stolen and butchered.	1	3
Health and safety issue in relation to cattle dung.	1	3
People generally like to see stock and consider it traditional.	1	3
Less use of grazed areas by people- not liking cattle/mud	1	3
Loss of income to farmer through aborted calves/dog worrying.	1	3
Disturbance to deer from events	1	3
Cattle dive bombed by model aircraft.	1	3
Feeding of livestock with inappropriate food.	1	3
Cost of haulage	1	3
Heifers on heat escaping into neighbouring field with a bull.	1	3
Mis-guided public concern over animal welfare.	1	3
Mistake to allow calving to occur on site with public access, can lead to conflict between cows and people wanting to see the calves.	1	3
Lack of experience within conservation organisation – animal welfare.	1	3
Inaccessible nature of site	1	3
Countryside Stewardship Scheme payments not adequate to cover costs of fencing.	1	3
Inappropriate breeds not suited to restoration grazing.	1	3

Visitor Survey for Keppel's Field LNR

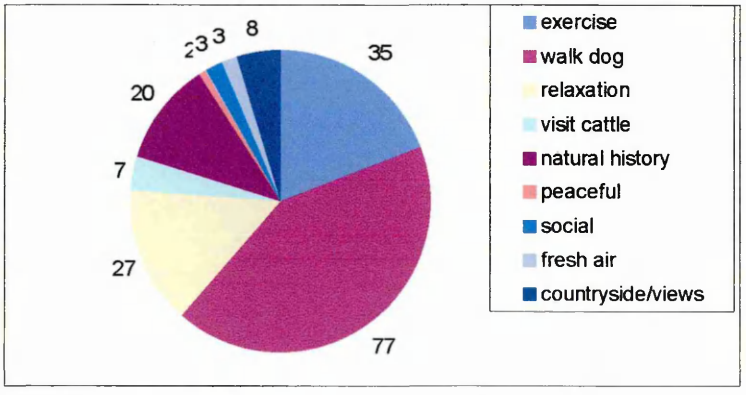
Sixty visitors were sampled on site. The majority walked to the site (93%) with only 5% travelling by car. 75% visit several times a day, 15% daily and 5% monthly. The length of visit varied considerably from 10 to 400 minutes spent on the site, the average time was 69 minutes. The Visitors all came from the local area Figure 13 illustrates the distribution of visitors to the site.

Figure 13 Distribution of visitors to the site



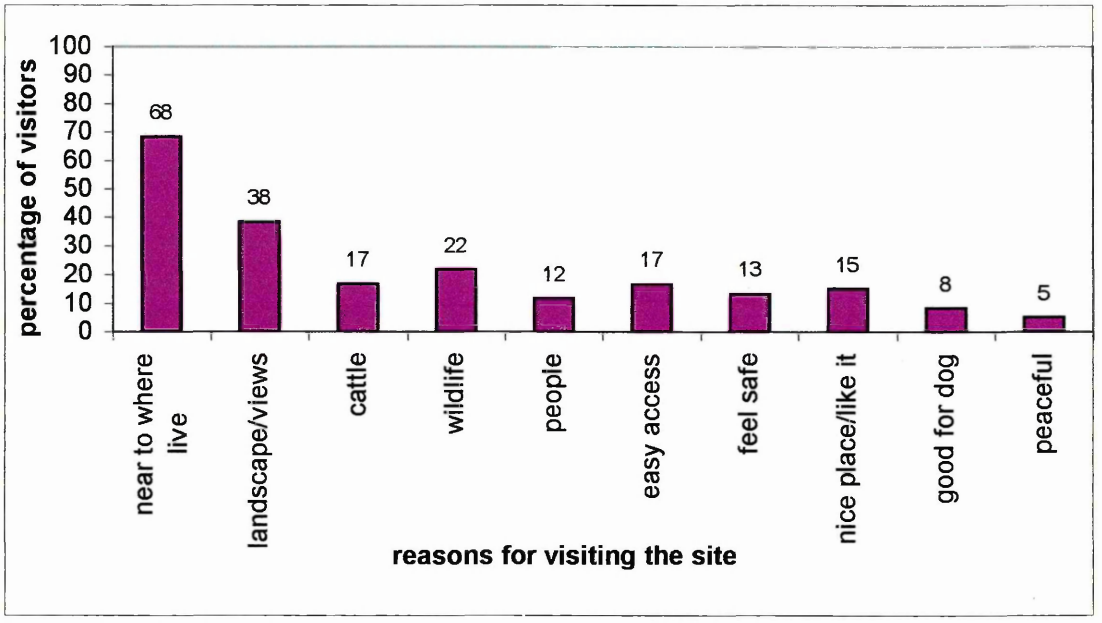
The purpose of their visits are illustrated in Figure 14. Many had more than one reason.

Figure 14 Purpose of visit to Keppel's Field (% of visitors)



There were ten reasons expressed for visiting Keppel's Field in preference to other places (see Figure 15).

Figure 15 Reasons given for visiting this site over other countryside sites.



17% of the visitors surveyed cited the presence of the Highland Cattle as a reason for visiting the site, reflecting the amenity benefit of grazing with Highland Cattle.

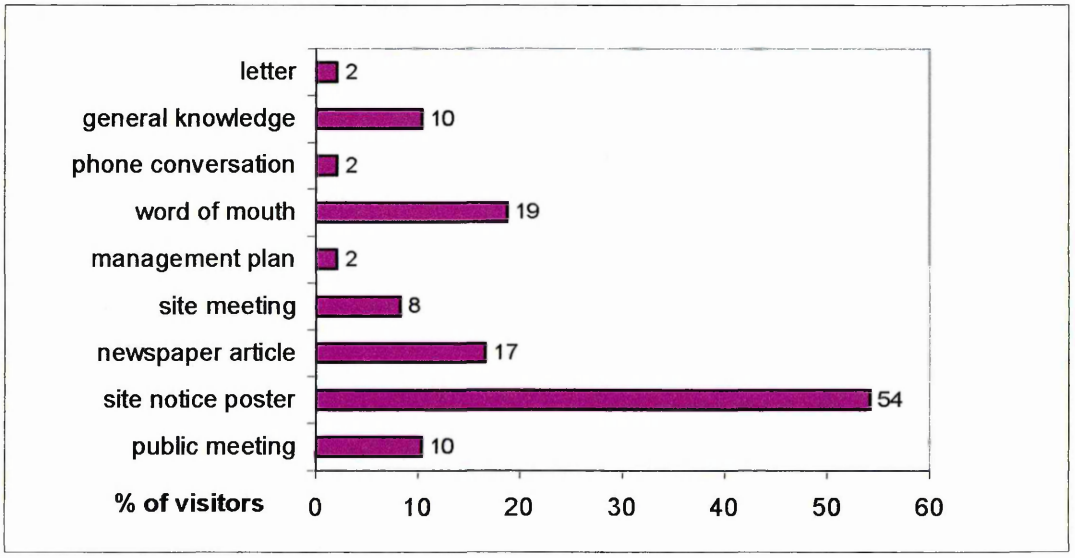
Site management knowledge

68% of the visitors knew that the Local Authority managed the site, 25% didn't know who managed the area and 5% thought it was the local estate.

73% of the visitors surveyed thought the site was managed to conserve its wildlife, botanical interest, or to prevent successional change of the grassland. 27% were unaware of why it was managed.

Of those who were aware they had acquired this knowledge from the following sources.

Figure 16 Source of site management knowledge



Support for management objectives

95% of the visitors, when the objectives of management were explained thought it should continue. The three visitors who thought management should change either wanted the site ungrazed as they felt it was better for wildlife or because the presence of the cattle interfered with their dog walking routine. One person felt that vehicle access to the cattle and their water supply needed to be improved.

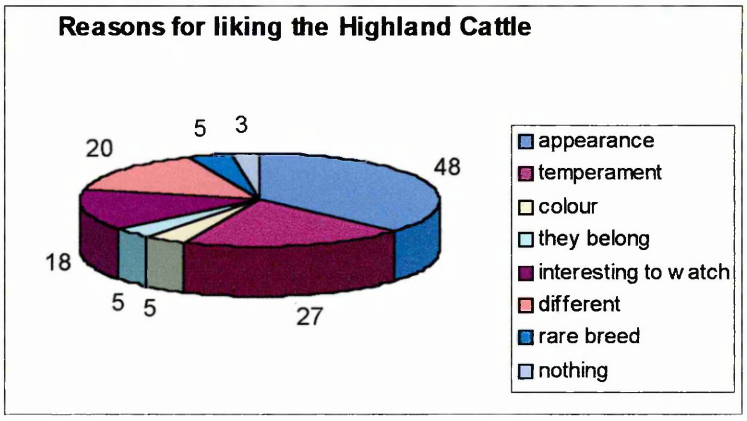
Effect of Highland Cattle on public enjoyment and interest.

The presence of the Highland cattle on site has increased their level of enjoyment and interest in the reserve for two-thirds of visitors, whilst for 23% the cattle made no difference. Only 2% stated that the presence of the cattle had decreased their enjoyment, because of the restriction in relation to walking their dogs.

13% of the visitors sampled visit more often now the cattle are there whilst for 77% it has made no difference.

When asked what they liked about the Highland cattle, a range of responses were given. These are illustrated in Figure 17.

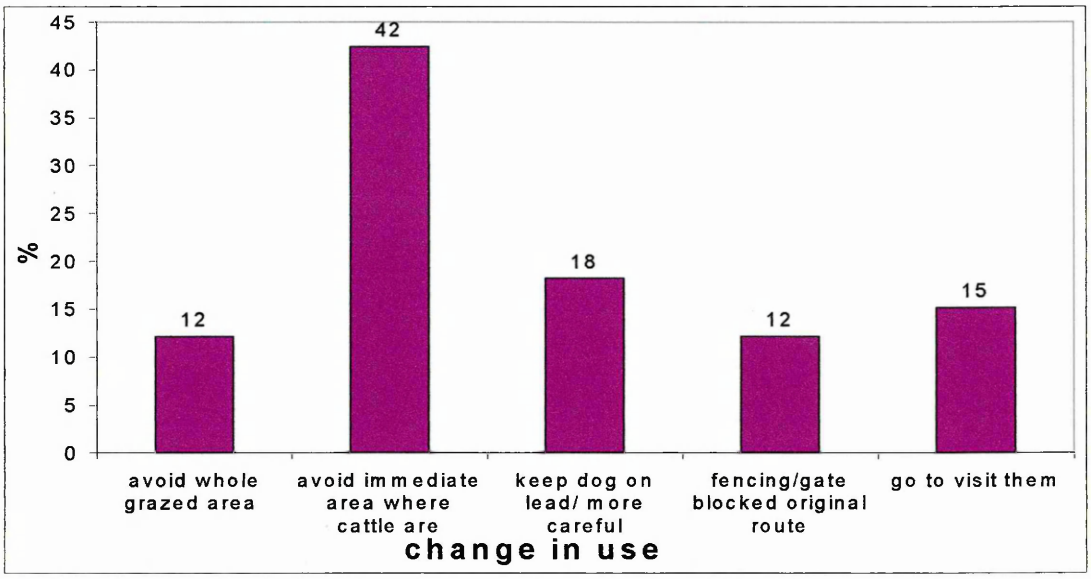
Figure 17 Reasons given by the visitors like the Highland cattle.



Influence of grazing on public use of the site.

55% of the survey stated that the introduction of grazing to part of the field had influenced the way they use the site, whilst 43% stated it had not.
Figure 18 illustrates the range of ways grazing influenced the public use of the reserve.

Figure 18 The influence of the cattle on the public use of the site.



Cost of grazing and cutting

The response to the request for financial information relating to capital and annual costs for grazing and cutting the same sites was varied.

- Capital and Annual Costs were provided for grazing for 55% of the sites.
- Capital and Annual costs were provided for cutting for 8% and 42% of the sites, respectively.

Cost of Grazing

Table 14 The number of sites with grazing cost information provided.

	Capital costs identified			*Annual costs identified*		
No. of sites	Yes	No	% of sites	Yes	No	% of sites
64	35	29	55	35	29	55

Capital and annual costs for grazing can be broken down into itemised costs (see Table 15).

Most sites had some capital costs for their grazing scheme, either stock costs or site infra structure. The first 14 sites own stock and the capital and annual costs reflect this. For most sites there were annual costs in relation to site maintenance.

Table 15 Capital and annual cost of grazing

	Capital cost of grazing (£)							Annual cost of grazing (£)								
Site name	Stock	Water	Boundary	Buildings	Safety	Vehicle	Total	Staff	Vet	Haulage	Boundary	Water	Notices	Feed	Other	Total
Netley Common	300	100	4000	250	150	0	4800	406	100	0	200	0	0	0	0	706
Sandy Point	300	500	4000	250	100	0	5150	812	100	0	200	50	0	0	0	1162
Bracebridge	1600	0	10000	800	0	0	12400	0	0	0	1200	300	0	0	0	1500
Deavall's Farm	225	30	200	50	0	25	530	250	25	0	0	0	0	25	0	300
Hazelslade LNR	225	0	200	0	0	25	450	250	0	0	100	0	0	25	0	375
Wollaton Park	2000	0	0	0	0	0	2000	0	700	200	0	0	800	0	0	1700
Wollaton Park	600	0	0	0	0	0	600	0	0	0	0	0	400	1000	0	1400
Graves Park	12500	0	0	0	0	2000	14500	30000	1000	0	1000	0	0	3000	0	35000
Westwood Country Park	12500	0	0	0	0	2000	14500	0	0	0	0	0	0	0	0	0
Firsby Reservoirs	1673	0	1950	0	600	1500	5723	4062	0	0	200	0	0	0	0	4262
Keppel's Field LNR	1673	1980	4926	0	5000	1500	15079	1484	0	0	100	100	5	0	0	1689
Kilnhurst Ings	1673	2000	2510	0	0	1500	7683	4762	0	0	400	0	25	0	0	5187
Meadowgate Lake and meadows	1673	160	14000	0	0	0	15833	4062	0	0	0	0	0	0	0	4062
Grange Park	1673	1600	9085	0	0	1500	13858	1484	0	0	200	100	20	0	0	1804
Laddedge Country Park	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10
Brough Park Fields	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10
Berry Head	0	0	5000	0	0	0	5000	0	0	0	0	0	0	0	0	0
Sharkham Point	0	0	1000	0	0	0	1000	0	0	0	0	0	0	0	0	0
Sutton Park	0	0	15000	1000		0	16000	10000	0	0	10000	0	0	0	0	20000
Hatchards Copse	0	0	200	0	0	0	200	0	0	0	0	0	0	0	0	0
Leigh Common	0	0	200	0	0	0	200	0	0	0	0	0	0	0	0	0
Pennington Copse	0	0	200	0	0	0	200	0	0	0	0	0	0	0	0	0
Doxey Marshes	0	0	0	0	0	0	0	0	0	0	1200	0	200	0	0	1400

Riverside Valley Park	0	0	0	0	0	0	0	0	0	0	400	0	0	0	0	400
Ludwell Valley Park	0	0	0	0	0	0	0	0	0	0	800	150	0	0	200	1150
Belvidere Meadows	0	400	4000	0	0	0	4400	0	0	0	50	0	0	0	50	100
Barley Valley LNR	0	0	4000	0	0	0	4000	0	0	0	100	0	0	0	100	200
Mincing Lake Valley Park	0	400	4000	0	0	0	4400	0	0	0	100	50	0	0	50	200
Corfe Hills South	0	0	3000	0	0	0	3000	0	0	0	100	0	50	0	0	150
Bourne Valley	0	0	6000	0	0	0	6000	0	0	0	100	0	0	0	0	100
Canford Heath	0	0	50000	0	0	0	50000	0	0	0	0	0	0	0	0	0
Bedelands Farm	0	0	1200	0	0	0	1200	0	0	0	0	0	30	0	0	30
G5 and G5 meadow	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0
Croxley Common Moor	0	0	4500	0	0	0	4500	0	0	0	0	0	0	0	0	0
Carlton Marsh	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	50
Coatham Marsh	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	50
Hacketts Marsh	300	150	5000	2250	100	0	7800	677	100	0	200	0	0	0	0	977
Wildmoor Heath	500	4000	31000	1000	0	1500	38000	2000	500	50	1000	50	200	100	0	3900
Beverdean Down	0	650	400	300	0	0	1350	0	0	0	0	0	0	0	234	234
Portsdown Hill c 11	0	2261	3868	0	0	0	6129	0	0	0	100	10	50	0	0	160
Portsdown Hill c 8,9,10	0	1200	19300	0	0	0	20500	0	0	0	200	10	50	0	0	260
Wharncliffe Heath	0	0	10000	0	0	0	10000	0	0	0	0	0	0	0	0	0
0 - no cost identified for that item																

Capital grazing costs and source of stock

The capital cost of grazing has been broken down into component costs and assessed to see the effect that the source of grazing stock has on the costs (see Table 16)

Expressed as the percentage of total number of sites using each stock source, for the specified capital cost items. Figures only apply to sites where costs were provided.

Table 16 The effect of stock source on the breakdown of the capital costs of grazing.

Source of stock	Capital Items					
	Stock	Water supply	Boundary	Buildings	Safety work	Vehicles
Own	100	50	71	29	29	57
Farmer	0	26	100	11	0	0
Own and Farmer	100	100	100	100	50	50

As expected the organisations that supplied capital costs that use their own stock to graze the sites have capital cost of stock purchase whilst for the sites grazed by other people's stock there is no capital cost identified for stock. 100% of the sites grazed using farmers' livestock have boundary capital costs.

Sites grazed by an organisation's own stock had the full range of capital costs expected for setting up a grazing scheme. However, for those sites grazed by an external source of livestock, the costs are concentrated on boundary provision (100%).

Only 42% of the sites that utilise someone else's livestock identified any capital costs.

Two sites are managed using the organisation's own stock in combination with a local farmer's livestock. In these instances the capital costs include stock purchase, together with site provisions for the livestock.

Annual costs of grazing

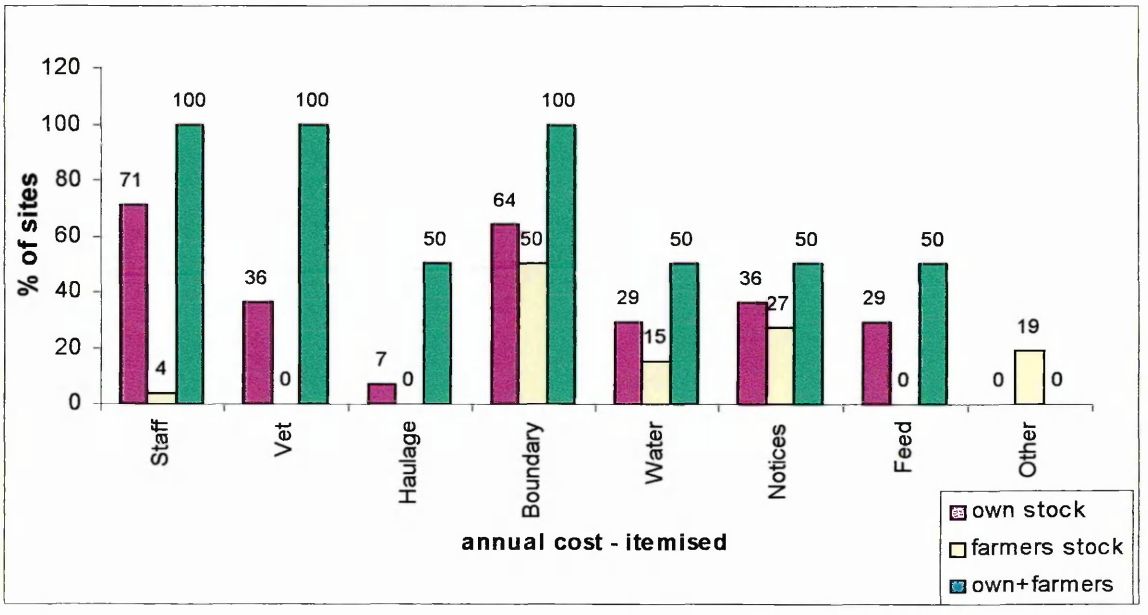
The annual costs of grazing can similarly be itemised. When these costs are examined in relation to stock source the distribution of the cost can be seen to vary in a similar way to the capital costs according to the source of the grazing stock on each site.

For sites grazed by the organization's own stock there are annual costs of staff, vets' bills and feed. The annual costs of grazing with a farmers/other livestock predominantly

involve boundary maintenance to secure the livestock, provision of water and provision of information to visitors. However, sites managed by own stock also have these site maintenance costs; in fact 64% of the sites grazed by own livestock have boundary costs compared to only 50% of the sites grazed by farmers livestock. The most significant difference in annual costs is the staffing and animal welfare costs, which in the case of own stock have to be met by the organisation. These costs would be the responsibility of the farmer providing the grazing animals on the other sites. Similarly where a farmer is providing the grazing it is possible to pass on other annual costs such as boundary and water supply responsibilities.

There are costs in relation to the staff and animal welfare items for the sites grazed by a combination of organisation's own stock and a farmer's stock.

Figure 19 The influence of source of stock on the breakdown of the annual costs of grazing



Income linked to grazing

32 of the sites have some form of long-term grant aid; one site has received two sources. Table 17 illustrates the range across the sites surveyed.

Table 17 Grant aid supporting management of the sites.

Countryside Stewardship Scheme	Wildlife enhancement Scheme	Section 35 capital grant Scheme	Reserves Enhancement Scheme	ESA payments
25	4	1	2	1

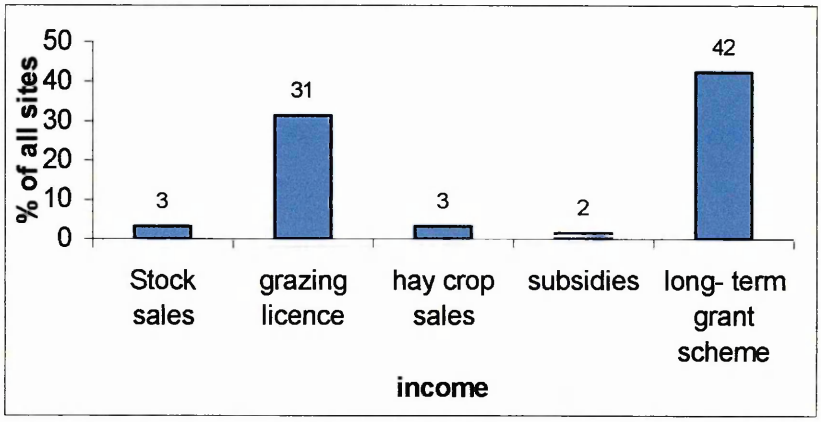
40 of the sites have a revenue budget to support the management, classified as funding for all sites, site budgets and general maintenance budget.

Organisations provided annual income figures for 32 (59%) of the sites.

As can be seen long-term grant schemes provide an important source of income for the sites. In fact for fifteen of the 32 sites (49%) providing figures, the only income identified was grant aid.

Grazing licences provided income for those sites grazed by a farmer or other external sources of stock. Stock sales were identified for two sites using their own stock to graze. Similarly subsidies were claimed for by one organisation using its own stock to graze its site.

Figure 20 Sources of income



Cost of Cutting

Table 18 Sites with cost information provided for management by cutting.

	Capital costs identified			*Annual costs identified*		
No. of sites	Yes	No	% of sites	Yes	No	% of sites
64	5	59	8	27	37	42

Capital and/or annual costs were provided for cutting for 26 (41%) of the total number of sites sampled. See Table 19.

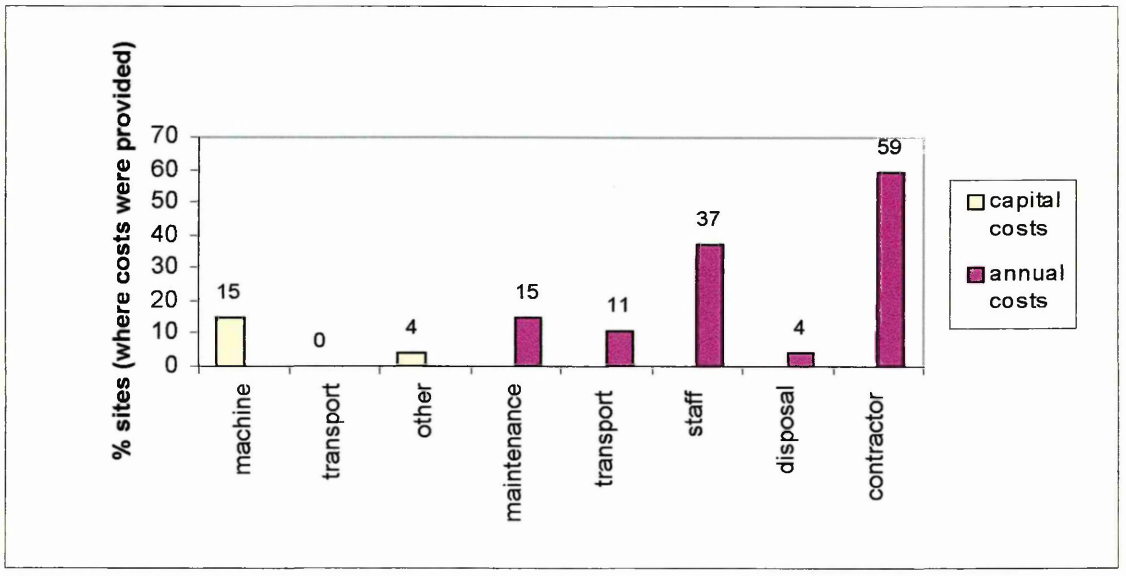
Table 19 Breakdown of capital and annual cost of cutting

Site name	Capital cost of cutting(£)			Annual cost of cutting(£)					
	machinery	other	**Total**	maintenance	transport	staff	disposal	contractor	**Total**
Wrens Nest		500	**500**			100			**100**
Hacketts Marsh	3,213		**3,213**	200	100	600			**900**
Netley Common	3,213		**3,213**	200	100	200			**500**
Sandy Point	3,213		**3,213**	200	100	400			**700**
Portsdown Hill c 11								5,000	**5,000**
Portsdown Hill c 8,9,10								10,000	**10,000**
Wildmoor Heath	40,0000		**40,0000**	1,000		2,000			**3,000**
Bracebridge								16,625	**16,625**
Sutton Park								213,750	**213,750**
Beverdean Down								228	**228**
Craigend Park						150			**150**
Khyber Park						100			**100**
Deavall's Farm						700	1,000		**1,700**
Riverside Valley Park								500	**500**
Ludwell Valley Park								2,000	**2,000**
Belvidere Meadows								150	**150**
Barley Valley LNR								150	**150**
Mincing Lake Valley Park								150	**150**
Carlton Marsh								1,000	**1,000**
Ardept								285	**285**
Home Farm								997	**997**
Firsby Reservoirs						5,308			**5,308**
Keppel's Field LNR						3,985			**3,985**
Kilnhurst Ings								713	**713**
Meadowgate Lake								998	**998**
Grange Park								570	**570**

Five of the 26 sites (19%) had capital and annual costs provided for cutting.
Whilst the remaining 81 % of sites only envisaged annual costs to implement cutting.

Figure 21 illustrates the breakdown of the capital costs and annual costs for 26 sites where price estimates were supplied by the site manager.

Figure 21 Breakdown of capital and annual costs of cutting



For the five sites where capital costs were envisaged, they cover the purchase of machinery. The annual costs for the management of those sites include maintenance and transport costs. 59% of the twenty-six sites would be cut using a contractor each year. 37 % of the sites would be cut by staff. The maintenance and transport annual costs only applied to those sites which also had capital costs for machinery.

Managing organisations of 52% of the sites state that giving a capital cost for cutting would not be applicable to their sites. For twenty-four out of these thirty-three sites, a reason is given to support this statement.

Table 20 Reasons given for stating cutting costs were not applicable to their site.

SITE	Not possible	Not feasible	cost not known	sold as hay crop
Hazelslade LNR	X			
Stephens Castle	X			
Corfe Hills South	X			
Bourne Valley	X			
Canford Heath	X			
Croxley Common		X		
Coatham Marsh	X			
Sally Clarks Meadow	X			
Firsby Reservoirs LNR		X		
Keppel's Field LNR		X		
Great Orme		X		
Meadowgate Lake		X		
Wollaton Park (a)			X	
Wollaton Park (b)			X	
Graeves Park			X	
Hawannah Colliery			X	
Leigh Common			X	
Doxey Marsh			X	
Rose End Meadow			X	
Kilnhurst Ings				X
Grange Park				X
Berry Head				X
Hatchards Copse				X
Roding Valley Meadows				X
No of sites	7	5	7	5
% of sites	29	21	29	21

For 50% of these sites it is stated that giving a price for cutting is not possible or feasible. For 29% the alternative cost of cutting was not known. For 21% the crop would be sold or given free as hay. For the remaining nine sites, no reason was given. Six sites supplied annual cutting costs even though they stated that cutting was not applicable.

In addition to the above sites where not applicable was stated as reason for giving no cutting costs three further sites did not identify grazing or cutting costs, as they formed part of a larger farm/estate budget and could not be separated.

Comparison of estimated cutting costs with standardised contractual prices.

Contractual costs (see Table 21) for hay making (taken from the Agro- Business Consultants 1999) provide recommended contract charges for hay making. They are guide figures for work done by professional agricultural contractors and include machinery, fuel and labour. They are based on new equipment prices and include:

depreciation charges over 3-7 years, a labour cost, spares and repairs, plus a 10-15% overall profit margins.

Table 21 Agricultural contract price for haymaking

Operation	Per Hectare
	£
Mowing	20
Turning,rowing up,	13.50 per pass
Conventional baling	4*
Bale Accumulator	10
	47.5

* bales calculated as average price per bale (£0.19-0.21)

estimated 20 conventional bales per hectare

Table 22 shows the estimated cutting costs, capital or annual, and the agricultural contract price based on the above for all the sites which provided costs for cutting (twenty-six or 41% of total sites)

Table 22 Comparison between estimated cutting cost and agricultural contractor price (Agricultural Budgeting and Costing Book 1999).

Site name	Total capital cost(£) -cutting	Total annual costs(£)-cutting (A)	Agricultural contractor cost(£) /site (B)	Difference in annual cost (£) (B-A)
Netley Common	3,213	500	769	+269
Sandy Point	3,213	700	854	+154
Bracebridge	0	16,625	1663	-14962
Deavall's Farm	0	1,700	195	-1505
Ardcpt	0	285	570	+285
Home Farm	0	997	1995	+998
Sutton Park	0	213,750	21375	-192375
Craigend Park	0	100	285	+185
Khyber Park	0	150	1045	+895
Riverside Valley Park	0	500	2280	+1780
Ludwell Valley Park	0	2,000	2660	+660
Belvidere Meadows	0	150	380	+230
Barley Valley LNR	0	150	475	+325
Mincing Lake Valley Park	0	150	285	+135
Carlton Marsh	0	1,000	1663	+663
Hacketts Marsh	3,213	900	998	+98
Wildmoor Heath	400,000	3,000	4703	+1703
Wrens Nest	500	100	1620	+1520
Beverdean Down	0	227.5	71	-156.5
Portsdown Hill c.11	0	5,000	214	-4786
Portsdown Hill c. 8,9,10	0	10,000	713	-9,287
Firsby Reservoirs	0	5308	309	-4999
Keppel's Field	0	3985	309	-3676
Kilnhurst Ings	0	713	713	0
Meadowgate Lake	0	998	998	0
Grange Park	0	570	570	0

For eight sites the estimated annual cutting cost supplied by the site managers was greater than the cost estimated using the standard cutting cost. For the remaining sites the managers have supplied estimated annual cutting costs lower than (15 sites) or same as (three sites) that calculated using standard contract price.

Comparison of the Estimated Costs for Grazing and Cutting

Ten (31%) organisations provided comparable costs allowing comparison of cutting and grazing costs for 20 (31%) sites (See Table 23). Out of these 20 sites, only four sites expected capital costs for cutting, whilst 90% estimated capital costs for grazing the sites.

Table 23 Comparison of grazing and cutting costs (£).

Site name	stock source	Total capital costs- grazing	Total estimated capital cost - cutting	Additional capital cost of cutting (!)	Total Annual costs-grazing	Total estimated annual costs-cutting	additional annual cost of cutting (#)
Netley Common	own	4,800	3,213	-1,587	706	500	-206
Sandy Point	own	5,150	3,213	-1,937	1,162	700	-462
Bracebridge	own	12,400	0	-12,400	1,500	16,625	15,125
Deavall's Farm	own	530	0	-530	300	1,700	1,400
Firsby Reservoirs	own	5723	0	-5,723	4262	5,308	1,046
Keppel's Field LNR	own	15079	0	-15,079	1689	3,985	2,296
Kilnhurst Ings	own	7683	0	-7,683	5187	713	-4,474
Meadowgate Lake	own	15833	0	-15,833	4062	998	-3,064
Grange Park	own	13858	0	-13,858	1804	570	-1,234
Sutton Park	farmers	16,000	0	-16,000	20,000	213,750	193,750
Riverside Valley Park	farmers	0	0	0.00	400	500	100
Ludwell Valley Park	farmers	0	0	0.00	1,150	2,000	850
Belvidere Meadows	farmers	4,400	0	-4,400.00	100	150	50
Barley Valley LNR	farmers	4,000	0	-4,000	200	150	-50
Mincing Lake Valley Park	farmers	4,400	0	-4,400	200	150	-50
Hacketts Marsh	own and farmers	7,800	3,213	-4,587	977	900	-77
Wildmoor Heath	own and farmers	38,000	400,000	362,000	3,900	3,000	-900
Beverdean Down	local enthusiast	1,350	0	-1,350	234	228	-6.5
Portsdown Hill c. 11	rare breeds centre	6,129	0	-6,129	160	5,000	4840
Portsdown Hill c. 8,9,10	grazing project	20,500	0	-20,500	260	10,000	9740

! minus indicates capital cost of grazing is greater than estimated cap. cost of cutting
minus indicates that annual grazing costs are greater than estimated cutting costs

However, when comparing annual costs between grazing and cutting, 50% of the sites estimated that cutting would be more expensive than grazing. It was estimated Sutton Park would cost £193,750 more to cut annually than graze, reflecting the size of the site.

The sites with extremely high costs for cutting reflect the site conditions where the organisations state that special machinery would be required (e.g. Portsdown Hill). Illustrating this point: managers state that for 32% of the total 64 sites studied topography is an influencing factor on choice between grazing and cutting.

Of the 20 sites which provided comparative costs for grazing and cutting, the following reasons were given for choosing grazing over cutting as a management tool:

Table 24 Reasons for selecting grazing instead of cutting for the twenty sites with comparative costs.

Site	topography	ground conditions	cost	vegetation type	historical	income	ecologically best	sustainable	habitat cond. for other species	to provide sward structure
Netley Common			x	x						
Sandy Point		x								
Bracebridge			x	x	x					
Deavall's Farm		x	x	x						
Firsby Reservoirs	x	x	x	x	x			x		
Keppels Field LNR	x	x		x				x	x	
Kilnhurst Ings					x				x	
Meadow gate Lake		x	x	x					x	
Grange Park				x						x
Sutton Park			x	x						
Riverside Valley Park					x					
Ludwell Valley Park					x					
Belvidere Meadows						x				
Barley Valley LNR					x					
Mincing Lake Valley Park					x					
Hacketts Marsh		x	x	x						
Wildmoor Heath	x	x	x					x		
Beverdean Down				x						
Portsdown Hill c. 11			x	x			x			
Portsdown Hill c. 8,9,10	x		x	x			x			

It is reassuring that the reasons are focused on ecological/conservation issues and not financial constraints.

Economic Appraisal

Objective of appraisal:

To compare the cost-effectiveness of cutting and grazing management of urban/urban fringe sites of conservation value in delivering the management objectives.

Options considered

Grazing the sites

Cutting the Sites

Respondents were asked to state whether alternative methods of managing the sites had been considered and what those methods were. 59% of organisations said they had considered alternative methods. Cutting, either for hay, amenity use or rotationally was seen as the main alternative to grazing.

The sites whose managers did not consider alternative methods of management used grazing because it was the traditional historical method of managing the site (11%) or for the ease of grazing, sustainable in the long-term and because grazing creates the right ecological conditions. The value of such non-marketable outputs within cost-benefit analysis is generally based on a quantity demanded or supplied; however where conservation issues are involved, consumer demand can be impossible to observe directly.

The cost-effectiveness of grazing has been compared with that of cutting using the information provided by the respondents. In addition consideration of costs and benefits identified by respondents that are immeasurable in terms of money are identified.

The Time Horizon (period of time over which the cost-effectiveness is assessed) of the appraisal is normally determined by the economic or physical life of the main asset or the period over which the service is required. Obviously it is desirable for the grazing to become a permanent management method and many of the non-marketable outputs may not be realised for decades. The main asset other than the livestock, is the physical structure of fencing. The useful lifetime of fencing will vary according to level of use, vandalism, location, ground condition, specification workmanship, quality of materials *etc.*

The useful lifetime of cutting machinery will vary according to use, specification and maintenance. Therefore the economic appraisal examines the costs and benefits (income) over time horizons of 5, 7 and 10 years. Included within the appraisal was the source of stock to assess whether this would have an impact on the costs and benefits. Only sites for which comparative costs were provided were included see Table 25, Table 26 and Table 27.

Table 25 Comparison of the estimated costs for grazing and cutting over a 5-year period

		Grazing						*Cutting*				
stock source	Site name	Capital cost £	Annual cost £	Annual income £	5 yr annual cost £	5 yr annual income £	Total 5yr cost(A) £	Capital cost £	Annual cost £	5yr annual £	Total 5yr cost(B) £	Total cost difference (B-A) £
own	Netley Common	4,800	706	-	2,974	-	7,774	3,313	500	2,106	5,419	-2,355
own	Sandy Point	5,150	1,162	-	4,895	-	10,045	3,313	700	2,949	6,262	-3,783
own	Bracebridge	12,400	1,500	-	6,319	-	18,719	-	16,625	70,031	70,031	51,313
own	Deavall's Farm	530	300	-	1,264	-	1,794	-	1,700	7,161	7,161	5,367
own	Firsby Reservoirs	5,723	4,262	454	17,953	1,912	21,764	-	5,308	22,359	22,359	596
own	Keppel's Field LNR	15,079	1,689	350	7,115	1,474	20,719	-	3,985	16,786	16,786	-3,933
own	Kilnhurst Ings	7,683	5,187	1,299	21,850	5,472	24,061	-	713	3,003	3,003	-21,057
own	Meadowgate Lake	15,833	4,062	1,608	17,111	6,774	26,170	-	998	4,204	4,204	-21,966
own	Grange Park	13,858	1,804	2,220	7,599	9,352	12,106	-	570	2,401	2,401	-9,705
outside	Sutton Park	16,000	20,000	2,000	84,248	8,425	91,823	-	213,750	900,401	900,401	808,577
outside	Riverside Valley Park	-	400	1,900	1,685	8,004	-6,319	-	500	2,106	2,106	8,425
outside	Ludwell Valley Park	-	1,150	1,500	4,844	6,319	-1,474	-	2,000	8,425	8,425	9,899
outside	Belvidere Meadows	4,400	100	35	421	147	4,674	-	150	632	632	-4,042
outside	Barley Valley LNR	4,000	200	205	842	864	3,979	-	150	632	632	-3,347
outside	Mincing Lake Valley Park	4,400	200	15	842	63	5,179	-	150	632	632	-4,547
outside	Hacketts Marsh	7,800	977	500	4,116	2,106	9,809	3,313	900	3,791	7,104	-2,705
outside	Wildmoor Heath	38,000	3,900	7,000	16,428	29,487	24,942	400,000	3,000	12,637	412,637	387,696
outside	Beverdean Down	1,350	234	-	986	-	2,336	-	228	958	958	-1,377
outside	Portsdown Hill compartment 11	6,129	160	250	674	1,053	5,750	-	5,000	21,062	21,062	15,312
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,095	3,829	17,766	-	10,000	42,124	42,124	24,358

Table 26 Comparison of the estimated costs for grazing and cutting over a 7-year period

		Grazing						*Cutting*				
stock source	Site name	Capital cost £	Annual cost £	Annual income £	7 yrs Annual cost £	7 yr Annual income £	Total 7yr cost (A) £	Capital cost £	Annual cost £	7yr Annual cost £	Total 10yr cost(B) £	Total cost difference (B-A) £
own	Netley Common	4,800	706	-	3,941	-	8,741	3,313	500	2,791	6,104	-2,637
own	Sandy Point	5,150	1,162	-	6,487	-	11,637	3,313	700	3,908	7,221	-4,416
own	Bracebridge	12,400	1,500	-	8,374	-	20,774	-	16,625	92,807	92,807	72,034
own	Deavall's Farm	530	300	-	1,675	-	2,205	-	1,700	9,490	9,490	7,285
own	Firsby Reservoirs	5,723	4,262	454	23,792	2,534	26,981	-	5,308	29,631	29,631	2,651
own	Keppel's Field LNR	15,079	1,689	350	9,429	1,954	22,554	-	3,985	22,246	22,246	-308
own	Kilnhurst Ings	7,683	5,187	1,299	28,956	7,252	29,387	-	713	3,980	3,980	-25,407
own	Meadowgate Lake	15,833	4,062	1,608	22,676	8,977	29,532	-	998	5,571	5,571	-23,961
own	Grange Park	13,858	1,804	2,220	10,071	12,393	11,536	-	570	3,182	3,182	-8,354
outside	Sutton Park	16,000	20,000	2,000	111,648	11,165	116,483	-	213,750	1,193,238	1,193,238	1,076,755
outside	Riverside Valley Park	-	400	1,900	2,233	10,607	-8,374	-	500	2,791	2,791	11,165
outside	Ludwell Valley Park	-	1,150	1,500	6,420	8,374	-1,954	-	2,000	11,165	11,165	13,119
outside	Belvidere Meadows	4,400	100	35	558	195	4,763	-	150	837	837	-3,925
outside	Barley Valley LNR	4,000	200	205	1,116	1,144	3,972	-	150	837	837	-3,135
outside	Mincing Lake Valley Park	4,400	200	15	1,116	84	5,433	-	150	837	837	-4,595
outside	Hacketts Marsh	7,800	977	500	5,454	2,791	10,463	3,313	900	5,024	8,337	-2,126
outside	Wildmoor Heath	38,000	3,900	7,000	21,771	39,077	20,695	400,000	3,000	16,747	416,747	396,053
outside	Beverdean Down	1,350	234	-	1,306	-	2,656	-	228	1,270	1,270	-1,386
outside	Portsdown Hill compartment 11	6,129	160	250	893	1,396	5,627	-	5,000	27,912	27,912	22,285
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,451	5,074	16,877	-	10,000	55,824	55,824	38,947

Table 27 Comparison of the estimated costs for grazing and cutting over a 10-year period

		Grazing						Cutting				
stock source	Site name	Capital cost £	Annual cost £	Annual income £	10 yrs annual cost £	10 yr annual income £	Total 10yr cost (A) £	Capital cost £	Annual cost £	10yr annual cost £	Total 10yr cost(B) £	Total cost difference (B-A) £
own	Netley Common	4,800	706	-	5,196	-	9,996	3,313	500	3,680	6,993	-3,003
own	Sandy Point	5,150	1,162	-	8,552	-	13,702	3,313	700	5,152	8,465	-5,237
own	Bracebridge	12,400	1,500	-	11,040	-	23,440	-	16,625	122,362	122,362	98,922
own	Deavall's Farm	530	300	-	2,208	-	2,738	-	1,700	12,512	12,512	9,774
own	Firsby Reservoirs	5,723	4,262	454	31,369	3,341	33,750	-	5,308	39,067	39,067	5,317
own	Keppel's Field LNR	15,079	1,689	350	12,431	2,576	24,934	-	3,985	29,330	29,330	4,396
own	Kilnhurst Ings	7,683	5,187	1,299	38,177	9,561	36,299	-	713	5,248	5,248	-31,051
own	Meadowgate Lake	15,833	4,062	1,608	29,897	11,835	33,895	-	998	7,345	7,345	-26,549
own	Grange Park	13,858	1,804	2,220	13,278	16,339	10,796	-	570	4,195	4,195	-6,601
outside	Sutton Park	6,000	20,000	2,000	147,202	14,720	148,482	-	213,750	1,573,221	1,573,220	1,424,740
outside	Riverside Valley Park	-	400	1,900	2,944	13,984	-11,040	-	500	3,680	3,680	14,720
outside	Ludwell Valley Park	-	1,150	1,500	8,464	11,040	-2,576	-	2,000	14,720	14,720	17,296
outside	Belvidere Meadows	4,400	100	35	736	257.60	4,878	-	150	1,104	1,104	-3,774
outside	Barley Valley LNR	4,000	200	205	1,472	1,509	3,963	-	150	1,104	1,104	-2,859
outside	Mincing Lake Valley Park	4,400	200	15	1,472	11	5,762	-	150	1,104	1,104	-4,658
outside	Hacketts Marsh	7,800	977	500	7,191	3,680	11,311	3,313	900	6,624	9,937	-1,374
outside	Wildmoor Heath	38,000	3,900	7,000	28,704	51,521	15,184	400,000	3,000	22,080	422,080	406,897
outside	Beverdean Down	1,350	234	-	1,722	-	3,072	-	228	1,674	1,674	-1,398
outside	Portsdown Hill compartment 11	6,129	160	250	1,178	1,840	5,467	-	5,000	36,801	36,801	31,334
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,914	6,690	15,723	-	10,000	73,601	73,601	57,878

Table 28 Comparison of the estimated cost for grazing and standard contractor price for cutting over 5 years.

		Grazing						*Standard Cutting Contract Prices*			
stock source	Site name	Capital cost ~ £	Annual cost ~ £	Annual income £	5yrs annual cost £	5yr annual income £	Total 5 year cost (A)£	Cost (£) per hectare #	Annual cost for site £	5 years annual cost (B) £	Total Cost Difference (B-A)
own	Netley Common	4,800	706	-	2,974	-	7,774	48	769	3,845	-3,929
own	Sandy Point	5,150	1,162	-	4,895	-	10,045	48	854	4,270	-5,775
own	Bracebridge	12,400	1,500	-	6,319	-	18,719	48	1,663	8,315	-10,404
own	Deavall's Farm	530	300	-	1,264	-	1,794	48	195	975	-819
own	Firsby Reservoirs	5,723	4,262	454	17,953	1,912	21,764	48	309	1,544	-20,220
own	Keppel's Field LNR	15,079	1,689	350	7,115	1,474	20,719	48	309	1,544	-19,176
own	Kilnhurst Ings	7,683	5,187	1,299	21,850	5,472	24,061	48	713	3,563	-20,498
own	Meadowgate Lake	15,833	4,062	1,608	17,111	6,774	26,170	48	998	4,988	-21,183
own	Grange Park	13,858	1,804	2,220	7,599	9,352	12,106	48	570	2,850	-9,256
outside	Sutton Park	16,000	20,000	2,000	84,248	8,425	91,823	48	21,375	106,875	15,052
outside	Riverside Valley Park	-	400	1,900	1,685	8,004	-6,319	48	2,280	11,400	17,719
outside	Ludwell Valley Park	-	1,150	1,500	4,844	6,319	-1,474	48	2,660	13,300	14,774
outside	Belvidere Meadows	4,400	100	35	421	147	4,674	48	380	1,900	-2,774
outside	Barley Valley LNR	4,000	200	205	842	864	3,979	48	475	2,375	-1,604
outside	Mincing Lake Valley Park	4,400	200	15	842	63	5,179	48	285	1,425	-3,754
outside	Hacketts Marsh	7,800	977	500	4,116	2,106	9,809	48	998	4,990	-4,819
outside	Wildmoor Heath	38,000	3,900	7,000	16,428	29,487	24,942	48	4,703	23,515	-1,427
outside	Beverdean Down	1,350	234	-	986	-	2,336	48	125	626	-1,709
outside	Portsdown Hill compartment 11	6,129	160	250	674	1,053	5,750	48	214	1,070	-4,680
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,095	3,829	17,766	48 # agricultural handbook	713	3,565	-14,201

Table 29 Comparison of the estimated cost for grazing and standard contractor price for cutting over 7 years

		Grazing						*Standard Cutting Contract Prices*			
stock source	Site name	Capital cost ~ £	Annual cost ~ £	Annual income £	7 yrs annual cost £	7yr annual income £	Total 7 yr cost (A) £	Cost per hectare £	Annual cost for site £	7 years annual cost(B) £	Total Cost Difference (B-A) £
own	Netley Common	4,800	706	-	3,941	-	8,741	48	769	5,383	-3,358
own	Sandy Point	5,150	1,162	-	6,487	-	11,637	48	854	5,978	-5,659
own	Bracebridge	12,400	1,500	-	8,374	-	20,774	48	1,663	11,641	-9,133
own	Deavall's Farm	530	300	-	1,675	-	2,205	48	195	1,365	-840
own	Firsby Reservoirs	5,723	4,262	454	23,792	2,534	26,981	48	309	2,161	-24,820
own	Keppel's Field LNR	15,079	1,689	350	9,429	1,954	22,554	48	309	2,161	-20,393
own	Kilnhurst Ings	7,683	5,187	1,299	28,956	7,252	29,387	48	713	4,988	-24,400
own	Meadowgate Lake	15,833	4,062	1,608	22,676	8,976	29,532	48	998	6,983	-22,550
own	Grange Park	13,858	1,804	2,220	10,071	12,393	11,536	48	570	3,990	-7,546
outside	Sutton Park	16,000	20,000	2,000	111,648	11,165	116,483	48	21,375	149,625	33,142
outside	Riverside Valley Park	-	400	1,900	2,233	10,607	-8,374	48	2,280	15,960	24,334
outside	Ludwell Valley Park	-	1,150	1,500	6,420	8,374	-1,954	48	2,660	18,620	20,574
outside	Belvidere Meadows	4,400	100	35	558	195	4,763	48	380	2,660	-2,103
outside	Barley Valley LNR	4,000	200	205	1,116	1,144	3,972	48	475	3,325	-647
outside	Mincing Lake Valley Park	4,400	200	15	1,116	84	5,433	48	285	1,995	-3,438
outside	Hacketts Marsh	7,800	977	500	5,454	2,791	10,463	48	998	6,986	-3,477
outside	Wildmoor Heath	38,000	3,900	7,000	21,771	39,077	20,695	48	4,703	32,921	12,226
outside	Beverdean Down	1,350	234	-	1,306	-	2,656	48	125	877	-1,780
outside	Portsdown Hill compartment 11	6,129	160	250	893	1,396	5,627	48	214	1,498	-4,129
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,451	5,074	16,877	48	713	4,991	-11,886

Table 30 Comparison of the estimated cost for grazing and standard contractor price for cutting over 10 years

		Grazing						Standard Cutting Contract Prices			
stock source	Site name	Capital cost ~ £	Annual cost ~ £	Annual income £	10 yrs annual cost £	10yr annual income £	Total 10 year cost (A) £	Cost per hectare £ #	Annual cost for site £	10 years annual cost (B) £	Total Cost Difference (B-A) £
own	Netley Common	4,800	706	-	5,196	-	9,996	48	769	7,690	-2,306
own	Sandy Point	5,150	1,162	-	8,552	-	13,702	48	854	8,540	-5,162
own	Bracebridge	12,400	1,500	-	11,040	-	23,440	48	1,663	16,630	-6,810
own	Deavall's Farm	530	300	-	2,208	-	2,738	48	195	1,950	-788
own	Firsby Reservoirs	5,723	4,262	454	31,369	3,341	33,750	48	309	3,088	-30,663
own	Keppel's Field LNR	15,079	1,689	350	12,431	2,576	24,934	48	309	3,088	-21,847
own	Kilnhurst Ings	7,683	5,187	1,299	38,177	9,561	36,299	48	713	7,125	-29,174
own	Meadowgate Lake	15,833	4,062	1,608	29,897	11,835	33,895	48	998	9,975	-23,920
own	Grange Park	13,858	1,804	2,220	13,278	16,339	10,796	48	570	5,700	-5,096
outside	Sutton Park	16,000	20,000	2,000	147,202	14,720	148,482	48	21,375	213,750	65,268
outside	Riverside Valley Park	-	400	1,900	2,944	13,984	-11,040	48	2,280	22,800	33,840
outside	Ludwell Valley Park	-	1,150	1,500	8,464	11,040	-2,576	48	2,660	26,600	29,176
outside	Belvidere Meadows	4,400	100	35	736	258	4,878	48	380	3,800	-1,078
outside	Barley Valley LNR	4,000	200	205	1,472	1,509	3,963	48	475	4,750	787
outside	Mincing Lake Valley Park	4,400	200	15	1,472	110	5,762	48	285	2,850	-2,912
outside	Hacketts Marsh	7,800	977	500	7,191	3,680	11,311	48	998	9,980	-1,331
outside	Wildmoor Heath	38,000	3,900	7,000	28,704	51,521	15,184	48	4,703	47,030	31,846
outside	Beverdean Down	1,350	234	-	1,722	-	3,072	48	125	1,253	-1,820
outside	Portsdown Hill compartment 11	6,129	160	250	1,178	1,840	5,467	48	214	2,140	-3,327
outside	Portsdown Hill compartments 8,9,10	20,500	260	909	1,914	6,690	15,723	48	713	7,130	-8,593

In addition, comparisons were made over the same time horizons, between the estimated costs of grazing and the standard contractor price obtained from Agro business Consultants (1999), see Table 28, Table 29 and Table 30. The capital and annual costs and the income identified by the respondents was compared, the figures were discounted back to present day values using the 6% rate.

The costs for grazing may vary according to the source of stock and therefore analysis of the cost has been examined accordingly.

Own Stock

Table 31 illustrates the total cost difference between estimated cutting and grazing costs provided for the sites which use their own stock to provide grazing. The figure were derived from Table 26, Table 27 and Table 28. A negative figure indicates that the estimated cost of grazing was higher than the estimated price of cutting. This table allows us examination of the influence different time horizons would have on the overall costs.

Table 31 Total difference between the estimated grazing and cutting costs over three time horizons.

Site	5 year horizon	7 year horizon	10 year horizon
Netley Common	-2,355	-2,637	-3,003
Sandy Point	-3,783	-4,416	-5,237
Bracebridge	51,313	72,034	98,922
Deavall's Farm	5,367	7,285	9,774
Firsby Reservoirs	596	2,651	5,317
Keppels Field	-3,933	-308	4396
Kilnhurst Ings	-21,057	-25,407	-31,051
Meadowgate Lake	-21,966	-23,961	-26,549
Grange Park	-9,705	-8,354	-6,601

For five of the sites grazed with the organisations own stock, grazing would prove more expensive over all the time horizons. This can explained by the fact that the estimated annual cutting cost was lower than the equivalent estimated cost of grazing and the capital costs for grazing were greater.

For three sites (Bracebridge, Deavall's Farm and Firsby Reservoirs) grazing is cheaper than cutting across all time horizons. For Keppel's Field it is more expensive to graze in the short-term but over 7 or 10 years it becomes cheaper to graze, relating to the high cost of cutting annually. Similarly for Firsby Reservoirs grazing is more economical than cutting over all the longer time horizons.

The estimated grazing costs were also compared with the standard contractor cost for cutting over the different time horizons (see Table 32).

Table 32 Total difference between the estimated grazing cost and agricultural contract cost for hay making over three time horizons.

Site	5 year horizon	7 year horizon	10 year horizon
Netley Common	-3929	-3358	-2306
Sandy Point	-5775	-5659	-5162
Bracebridge	-10404	-9133	-6810
Deavall's Farm	-819	-840	-788
Firsby Reservoirs	-20220	-24820	-30663
Keppels Field	-19176	-20393	-21847
Kilnhurst Ings	-20498	-24400	-29174
Meadowgate Lake	-21183	-22550	-23920
Grange Park	-9256	-7546	-5096

Using these figures it would appear that it is cheaper to cut all the sites (100%) than to graze them with their own stock. The price difference again declines for some of the sites over a longer time period. Whilst for four it gradually increases because the annual cost of grazing is higher than the contractor price for the size of site.

Farmer's /other stock

Table 33 illustrates the price difference between estimated cutting and grazing costs provided for the sites which use someone else's stock to provide grazing. A negative figure indicates that the estimated cost of grazing was higher than the estimated price of cutting. This table allows examination of the influence different time horizons would have on the overall costs.

Table 33 Total cost difference between the estimated grazing and cutting costs over three time horizons.

Site	5 year horizon	7 year horizon	10 year horizon
Sutton Park	808,577	1,076.755	1,424,740
Riverside V.P	8,425	11,165	14,720
Ludwell V.P	9,899	13,119	17,296
Belvidere Meadows	-4,042	-3,925	-3,774
Barley Valley	-3,347	-3,135	-2,859
Mincing Lake V.P.	-4 547	-4,595	-4,658
Hacketts Marsh	-2,705	-2,126	-1,374
Wildmoor Heath	387,696	396,053	406,897
Beverdean Down	-1,377	-1,386	-1,398
Portsdown Hill C11	15,312	22,285	31,334
Portsdown Hill C 8,9,10	24,358	38,947	57,878

For six sites (55%) it proves to be cheaper to graze than to cut, and the longer the time horizon the greater the difference between the estimated costs. For the remaining five

(45%) sites it is cheaper to cut than graze although the difference between the costs declines with time.

Again these price differences were compared with those generated using the standard contractors rate for cutting (see Table 34).

Table 34 Total difference between the estimated grazing cost and agricultural hay making cost over three time horizons.

Site	5 year horizon	7 year horizon	10 year horizon
Sutton Park	15,052	33,142	65,268
Riverside V.P	17,719	24,334	33,840
Ludwell V.P	14,774	20,574	29,176
Belvidere Meadows	-2774	-2103	-1078
Barley Valley	-1604	-647	787
Mincing Lake V.P.	-3754	-3438	-2912
Hacketts Marsh	-4819	-3477	-1331
Wildmoor Heath	-1427	12,226	31,846
Beverdean Down	-1709	-1780	-1820
Portsdown Hill C11	-4680	[illegible]	-3327
Portsdown Hill C 8,9,10	-14201	-11886	-8593

For Sutton Park, Riverside Valley Park, Ludwell Valley Park (27%) it is cheaper to graze than to cut whether the estimate cost or standard contractual cost is applied. Grazing becomes cheaper with increasing time horizons.

For the remaining eight sites (73%), although cutting is cheaper than grazing if the standard contract price is applied, the difference between the costs decreases proportionally with time. The only exception is Beverdean Down where the price difference increases slightly over the years.

Case Studies

The four organisations selected as case studies illustrate the variety of ways grazing is being implemented in the urban setting. Birmingham City Council and Hampshire County Council utilise a combination of their own and local farmers stock, whilst Rotherham Metropolitan Borough Council owns a large range of livestock providing grazing for several local conservation organisations. Exeter City Council on the other hand uses a range of local farmers to provide grazing at several sites across the City.

Birmingham City Council

The City Council owns and manages Sutton Park National Nature Reserve (NNR). This is situated within the urban setting of Sutton Coldfield. The NNR is divided into two sites, Sutton Park and Bracebridge for the purpose of this case study, based on the different methods of implementation of grazing management.

The sites are managed by the Countryside Service within the Department of Recreation and Community Services. The Management Plan for the whole NNR has been completed by consultants Cobham Resource Consultants in 1991 and Wardell Armstrong in 1997(Box and Bramwell, 1998).

Table 35 Sites grazed by Birmingham City Council.

Site name	Grid reference	Grazed areas (ha)	Site status	Habitat	Stock	Season of grazing
Sutton Park	SP 410298	450	NNR	Heath, Acid grassland, mire	Continent al cattle	Apr- Oct
Bracebridge	SP 410298	35	NNR	Acid heathland	Exmoor Ponies	All year

Historical grazing

Sutton Park was originally part of the Great Chase of Sutton. Large herbivores have been associated with the Park for centuries, and their presence has maintained the medieval park layout of woodland and non-woodland communities (Box and Bramwell, 1998). The Park was enclosed from the open Chase in 1315. Bishop Vesey gave the Park to Sutton Coldfield in 1528 and the Royal Park was grazed under commoners' rights which were rescinded in the early 20th century. The woods were enclosed and the Park stocked with mares, colts and horses. Cattle were also present.

Records back to 1890's identify horse and cattle grazing from spring to autumn each year. The level of grazing declined during the twentieth century and horse grazing ceased in 1960. The latter was primarily a result of vandalism against the horses from people. Decline in grazing led to scrub encroachment onto the grassland, heathland and mire communities. The Management Plan for both sites focuses on the need to increase the grazing levels within the Park. There is a wealth of information within the annual cattle registers documenting the history of grazing at the Park.

Implementation of Grazing

Sutton Park is now grazed primarily by mixed continental breeds of cattle. Approximately 485 hectares of the 900 hectare Park are grazed by 200 cattle. Bracebridge, the area of heathland north of the railway, is now grazed by Exmoor Ponies, that were purchased by the City Council in 1998. There are eight ponies and they were selected because of their suitability to the vegetation communities.

Bracebridge was an ideal location for the small-scale introduction of pony grazing. The site is isolated from the rest of the Park and the ponies could easily be contained in this area. The cost of fencing was reduced by the fenced boundaries of the railway and roads.

The cattle are provided by local graziers under annual license. There is no opportunity to select the breed of cattle under this arrangement and the availability is limited to commercially farmed continental cattle. The cattle graze between April and October each year. This period of grazing is dictated by the availability of vegetation on the Park and also by the potential for acorn poisoning of stock. The farmers who provide the grazing can claim relevant subsidies from DEFRA. However, this year (2000) there is a problem with the Integrated Administration and Control System because the grazing period is less than seven months. To claim subsidies the farmers have to graze for seven months out of twelve. It is not possible to extend the grazing period because of the above constraints and it is not financially viable for the farmers to graze the land without any subsidy. The City Council and English Nature are currently trying to resolve the matter. The implication in the long-term is serious and may lead to the Council having to consider alternative arrangements to achieve the grazing vital to the Park.

The grazing for Sutton Park is advertised annually and the respondents divide it up between themselves. The license is formal and includes strict animal welfare conditions and restrictions in height and weight. No in-calf heifers or steers are permitted on public safety grounds.

The Park staff contribute time in the form of an annual roundup at the end of the grazing season. The boundary and water supply are maintained by the City of Birmingham, the fencing is contracted out to an English Nature recommended contractor.

The annual license fee is currently £10/head and is reviewed annually. The farmers are happy to pay this level if they can claim the relevant subsidies. If not then the City Council may have to look at reducing the fee.

Animal Welfare

The farmers are liable legally for the cattle and the Ranger staff also check them regularly in relation to animal welfare issues, to promote good public relations. There is an animal welfare officer within the Authority and the background of each farmer in relation to animal welfare is checked prior to licensing. The staff at the Park reserve the right to call in a vet and to bill the farmer for the necessary treatment.

The only animal welfare difficulties have been in relation to escapes and cases of the bacterial disease Blackleg, which is carried in the soil. However, cattle can be immunised annually for this disease.

The Exmoor Ponies are checked daily by the staff. The Rangers have gained considerable experience in handling livestock, rounding up and using cattle crushes. Several of the staff come from agricultural backgrounds and have prior experience of stock. No formal training has been given.

Benefits of existing system

The benefits identified in using farmers' stock were principally that the legal and animal welfare responsibility for the cattle falls to the farmers. Disadvantages are finding enough farmers prepared to graze, and issues such as the Integrated Administration Control System (IACS) subsidies.

Possible improvements

Two improvements to the existing grazing programme were identified by the site manager:

1. The use of hardier, non-horned breed better suited to the vegetation communities on the site.

2. Increasing the level of grazing to that recommended within the management plan, this is currently constrained by staff time and existing commitments.

The staff at the Park are considering the viability of the Council purchasing its own stock. One concern is that with the existing staffing resource the Council could not manage the number of cattle required to graze 450 hectares effectively. Taking on the legal responsibility and greater animal welfare responsibility is also a major commitment. Land would be required to graze the cattle on during the period they are unable to graze within the Sutton Park.

There are plans to increase the use of Exmoor ponies within Bracebridge section of the NNR, but not in the majority of the Park. This is because of the level of public access and concern over animal welfare and also the additional fencing cost that would be required for ponies to be contained safely. The site manager also considers it inappropriate to subdivide the main Park to facilitate grazing with the ponies, because of its open nature and landscape history. Fencing would detract from the open nature of the Park and may prove controversial with users.

The City Council manages other sites where grazing would be advantageous. In particular it has a large riverside development site, which could provide the necessary winter grazing should the Council consider purchasing its own stock. Currently the riverside site is ungrazed and so grazing with farmers' stock would provide additional burden on staff resources. The site is more isolated with no resident staff and so supervision would be more time consuming.

Support

Support for the work of the Ranger Service and Sutton Park is mixed within the Authority. The public are generally supportive with only the occasional concern or complaint. Cattle are excluded from areas of high visitor pressure like the playground, to avoid health and safety issues related to cow dung.

The Ranger staff have a good working relationship with English Nature and with academic research staff involved in the management plan and research aspect of Sutton Park.

Monitoring

Grazing management is achieving the objectives identified for the sites. The Management Plan is reviewed annually. Species count surveys are undertaken to assess the presence and distribution of identified indicator species. Fixed Point and aerial photography are used to assess the spread of scrub/woodland and to assess the change in ecotone balance. Students are often utilised to carry out surveys/ monitoring projects. Surveys of specialist groups of invertebrates are contracted out. Staff carry out bird surveys and the Park is identified as a "continued effort" site with British Trust for Ornithology.

The benefits of grazing for site conservation are felt to be considerable. The site as a whole is renowned for its diversity of ecotones and there are many publications about the site's worth and the grazing management. Some of these emphasise the importance of the grazing to the site's wildlife interest (Box and Bramwell, 1998). That grazing was the traditional and ancient method of managing Sutton Park is itself important and perhaps indicative of the potential value of this for conservation management.

Grazing is felt to be of only minor benefit to the amenity value and public relations value of the site although it is reported that the visitors expect and like to see the cattle and they play a successful role in reporting on the cattle. Interpretative information is on display within the Visitor Centre, telling people the reason for grazing, the grazing history of the Park, about the stock and advice on the treatment of the stock. The experience of the staff tell them it is successful. No formal monitoring takes place.

Public Access and Opinion

Sutton Park attracts up to two million visitors annually. The grazing of the Park has to be carried alongside the public use of the Park. Access is open across the Park . There is the option of walking in "cattle free areas" available within the woodland areas.

Correct breed selection is important bearing in mind the level of public access. Un-horned breeds are used to reduce potential public risk and there are restrictions on the use of cows with calves and steers. There are not perceived to be any conflict between grazing the site and the local people or visitors, this is explained by the fact that the Park has been grazed continuously and people are used to seeing the cattle.

Finance

25% of the set up costs for the pony grazing was funded by an English Nature Section 35 Capital Grant Scheme. The City Council funded the remainder. Countryside Stewardship funding is being considered but would need to exclude areas receiving Woodland Grant Scheme or Section 35 funding.

The estimated annual cost to the Council of implementing grazing across the whole Park is estimated at between £20,000-£25,000. This figure includes an estimate of the staff time, and administration involved, as well as maintenance of the boundary, which is considerable (£15,000) on a large site such as this.

Table 36 Capital Cost of grazing (£)

Item	Bracebridge	Sutton Park
Stock	1,600	
Water supply		
Boundary fencing	20,000	
Corral	800	
Cattle grids		1000

Table 37 Annual Cost of grazing (£)

Item	Bracebridge	Sutton Park
Maintenance of boundary Water supply, cattle grids etc	1000-2000	15,000
Staff time- administration, licenses, roundup, checking stock	-	6000- 10,000

Table 38 Annual Income from grazing(£)

Item	Bracebridge	Sutton Park
Grazing license	Nil	2,000
Grant aid	Nil	None
subsidies	Nil	Go to farmer

Funding does not directly restrict the expansion of grazing within Sutton Park. Capital costs for stock purchase could be found and partly grant aided, but the staff resources are limiting, particularly in the case of owning enough stock to graze such a large site and the extra commitments that would be necessary.

Alternative management

Grazing has been the method of managing Sutton Park for centuries. It has created the balance of habitat-types and communities within the Park. The exact effect of grazing would be impossible to duplicate by other methods such as cutting. From an ecological perspective it is felt that it would be impossible to manage the Park by another method

eg. cutting or burning, and achieve the same results in terms of the range and quality of vegetation communities.

The Park could be managed in a different way by cutting/flailing, say 10% of the site per year. However, the cost would be between £25-£30,000 a year and the result would be significantly different. Cutting would be unable to create the diversity within the vegetation communities created by grazing extensively. Similarly the effect of cutting could impact on invertebrate interest that has developed as a result of grazing. The cost of managing the land does affect the decision to graze to some degree but the grazing effect is the main critical consideration.

Costs of Cutting as an alternative management method

To replace grazing, a portion of the site would have to be cut each year. To minimise potential impact on wildlife interest only 10% would be cut in any one year. It would be impractical to cut the whole site each year, because of its size and vegetation type.

The cost of cutting was estimated at £350 - £600 per hectare. The annual cost of managing just 10% of the area currently grazed is estimated to cost between £15,750 and £27,000. In addition there would be a loss in income from the grazing licence.

Comparison of grazing and cutting costs over a time period of ten years.

No capital cost was identified for cutting. A contractor would be paid annually. All the figures are discounted to present day values using a 6% rate.

Table 39 Comparison of estimated grazing and cutting costs for Birmingham City Council over ten years (£).

	Grazing				Cutting	
	Capital cost	Annual cost	Annual Income	10 year period	Annual cost	10 year
Sutton Park	16,000	20,000	2,000	148,482	213,750	1,573,221
Bracebridge	12,400	1,500		23,440	16,625	122,362
Total	28,400	21,500	2,000	158,242	230, 375	1,695,583

To cut the same area that is currently grazed would cost considerably more than the existing cost of grazing, either on an annual basis or over a long- term period of ten years.

The future

The main issues identified in relation to the management of Sutton Park were identified as habitat succession, nutrient enrichment and visitor pressure/carrying capacity of the site and increasing urbanisation.

The Park staff are cautiously optimistic about the future but unsure of the long-term security of grazing at Sutton Park particularly with the existing problem with IACs subsidy claims.

Exeter City Council

Exeter's Urban Fringe.

Exeter is regarded as predominately urban. However, approximately half the total area is outside the built up area. The Council recognises the importance of protecting and enhancing these green areas and natural habitats and policies to protect the City's Countryside have been incorporated into the Exeter City Plan since 1982.

Six countryside Valley Parks, covering 486 hectares provide easy access to attractive open space close to people's homes. Overall management aims to protect the landscape and wildlife habitats, improve access where appropriate and develop environmental education. The Countryside Service manage the Valley Parks. The organisation manage five sites within the Valley Parks by grazing. These are given in the table below.

Table 40 Sites grazed by Exeter City Council in the urban fringe.

Site name	Grid reference	Size of grazed area	Site status	Habitat-type	Grazing period
Riverside Valley Park	SX 940895	48 ha	SSSI	Wet meadows	8 months
Ludwell Valley Park	SX 946911	56 ha	SNCI	Improved grassland	All year
Belvidere Meadows	SX 920947	8 ha	LNR	Neutral grassland	3 months
Barley Valley LNR	SX 900925	10 ha	LNR	Species rich/improved grassland	5 months
Mincing Lake Valley Park	SX 936947	6 ha	SNCI	Species rich grassland/scrub	3 months

The Council purchased land within the different Valley Parks when it became available. They own 90% of Ludwell Valley Park which was acquired in the 1930's. They own

75% of Mincing Lake Valley Park, 70% of Riverside Valley Park. Belvedere Meadows are City Council owned and are situated within the Duryard Valley Park. The two fields were purchased under a compulsory Purchase Order in 1988 to protect them from development. The outstanding floristic diversity of the fields was recognised by the council and the sites were declared a Local Nature Reserve.

Grazing was selected as it was the best method of management to achieve the conservation objectives. All the sites apart from Mincing Lake Valley Park had been grazed continuously. The nature of the sites make any alternative difficult in some cases. If the sites were not grazed then the grasslands would either be topped or left unmanaged.

Implementation of grazing

All the sites are grazed by local farmers' stock, under an annual grazing licence. The cattle are mixed beef cattle, breed unknown and the Service get no choice in the breed. On several of the sites the same farmer has provided the grazing for many years. The license is formal and the Countryside Service have a good working relationship with the farmers. There is a demand for good grazing and there has been little difficulty in finding replacement graziers when necessary. This usually happens by word of mouth or through advertising if necessary. The Countryside Service decide upon the terms and conditions. The annual fee for the licenses was inherited when the Service took over the management. New graziers offer a price they think is fair. The fee is annually amended in relation to the grazing available. The farmers have been happy to pay the fee requested to date. The formal administration of the license is handled by the Estate section. In the case of Mincing Lake Valley Park it has proved difficult to let the license because the site is smaller and there are constraints on grazing regime. The vehicle access is difficult and the grazing is quite rough. The site remained ungrazed for autumn 1999.

The income from the grazing licence was not considered as significant when the decision on methods of management were made, the amount forms a small part of the overall budget.

Animal welfare

The farmers are responsible for their stock and they are checked more or less daily. The responsibility for animal welfare is formalised in the license. There have been no serious animal welfare concerns. Residents near Mincing Lake Valley Park voiced their concern over the cattle several years ago. The condition of the cattle was fine and it

was basically put down to the residents' inexperience of animal welfare issues and tendency for people to be overly concerned. All the sites have open access and because of this the Countryside Service, in fairness to the farmer, maintain the boundaries and water supply.

Benefits of system in place

The particular benefits identified for using someone else's stock were that it was easy to implement and there were no animal welfare responsibilities. The Service would consider purchasing its own stock if it became necessary but would be concerned over having the time and expertise and facilities to make it viable.

Possible Improvements

Several of the sites would ecologically benefit from sheep grazing but it is difficult to obtain as farmers are reluctant due to other problems on site like the presence of bramble scrub on Belvidere Meadows. The Service would also like to be able to use a different breed of cattle. In particular Longhorns are favoured because of there breed profile and suitability to the habitat-types. It was felt that they would also have amenity appeal.

Constraints

There are other countryside sites which the Service would ideally like to graze. However the constraints associated with a higher level of public use were considered to be too great to permit grazing at that time (2000).

Support

Staff from the Service are involved in the Grazing Animals Project and get the opportunity to exchange ideas with other land managers.

Monitoring

It is felt that grazing has achieved the management objectives for most of the sites, although there is a perceived reluctance of the grazed stock to tackle areas of scrub effectively. However, the grazing maintains the status quo and prevents deterioration of the grasslands. The organisation feel that overall the grazing is of major benefit to the conservation of the vegetation communities. The organisation monitor changes in the vegetation communities and associated wildlife interest. Regular botanical surveys are carried out by local wildlife trusts, the Exeter Urban Wildlife Group and there is good availability of local expertise. Most of the survey work is put out to contract. The staff

implement butterfly transects on several sites. Also, English Nature surveyed the area in 1989 in connection with the LNR and SSSI designations.

Public access and opinion

Public access is encouraged through the grazed areas on all the sites. Promoting use of the countryside to local people is the main objective of the Valley Parks. When the council took on the sites grazing was already established and consultation was not an issue. In general it is accepted as part of the sites' features. At Ludwell and Riverside Valley Parks options are available allowing people to walk in stock-free areas.

There have been a few minor incidences connected to vandalism and level of public use but these were classified as minor and had little effect on the continued grazing of the sites. It was felt that there would have to be a major health and safety incident in order to question the continued grazing of certain sites. Grazing with cows and calves is now avoided to minimise risk; in the past they have been permitted. There is no formal assessment of the risk associated with the grazing of sites. However, the Service is only just beginning to implement formal risk assessments (2000). The Countryside Service holds meetings with Residents' Associations when problems arise. Local people assist by reporting any problems with the cattle or site in general.

Overall there has been support for the grazing from local people who like to see the cattle. There has been some recent opposition to the grazing at Ludwell Valley Park in relation to the farmer over-stocking the fields resulting in poaching of the ground, which was unpopular with local users. However a new grazing regime was introduced in 1999 and the Countryside Service hope this will win people round again. Councillors support the grazing of the sites.

The amenity and public relation benefits of grazing are not formally assessed but are monitored in relation to the number of complaints and other feedback.

Finance

Countryside Stewardship Scheme Grant aid is claimed for Riverside Valley Park. The other sites would qualify for the same grant aid but the Service can achieve the objectives using their local authority budget, which is ample. They feel the money available through C.C.S can be put to more effective use by supporting other landowners in the area to manage land sympathetically.

Table 41 Capital cost of grazing (£)

Item	Riverside Valley Park	Ludwell Valley Park	Belvedere Meadows	Barley Valley	Mincing Lake Valley Park
Water supply	None-river	150	400	None-stream and pond	400
Boundary control	-	-	4000	4000	4000
Total	-	**150**	**4400**	**4000**	**4400**

Table 42 Annual cost of grazing (£)

Item	Riverside Valley Park	Ludwell Valley Park	Belvedere Meadows	Barley Valley	Mincing Lake Valley Park
Water supply	-	150	-	-	50
Boundary control	400	800	50	100	100
Ragwort/ Thistle removal	-	200	50	100	50
Total	**400**	**1150**	**100**	**200**	**200**

Table 43 Annual Income from grazing (£)

Item	Riverside Valley Park	Ludwell Valley Park	Belvedere Meadows	Barley Valley	Mincing Lake Valley Park
Grazing Licence	1900	1500	35	205	15

Alternative Management Costs

The site manager has estimated the price of a contractor cutting the grasslands to be considerably lower than the standard contract price calculated for the areas (Agricultural Budgeting and Costing Book, No. 49, November 1999). However it is still cheaper to graze the sites. Also there would be loss of income in relation to the grazing licenses if management was changed to cutting.

There is no capital cost identified for cutting, based on the fact that a contractor would be paid annually.

Table 44 Comparison of estimated grazing and cutting costs for Exeter City Council (£)

Site	Grazing				Cutting	
	Capital cost	Annual cost	Annual Income	10 year	Annual cost	10 year
Riverside Valley	0	400	1,900	11,040	500	3,680
Ludwell Valley	0	1,150	1,500	2,576	2,000	14,720
Belvidere Meadows	4,400	100	35	4,878	150	1,104
Barley Valley	4,000	200	205	3,963	150	1,104
Mincing Lake Valley	4,400	200	15	5,762	150	1,104
Total	12,800	2,050	3,655	28,219	2,950	21,712

Cost Estimates over a time period of ten years, discounted back to present day using 6% rate.

As stated on the questionnaire and in follow up interview, these prices for cutting were very approximate and not based on any comparable figures. For three of the sites it would appear that it is cheaper to cut on a long-term basis. Over a ten-year period there would be a total estimated saving of £6507 if the sites were managed by cutting.

However, if the standard hay-cutting price is applied to the sites the following occurs:

Table 45 Comparison of estimated grazing cost and agricultural contractor price for hay making over a ten year period (£).

Site	Grazing	Cutting	Cutting
	10 year	**Annual cost**	**10 year**
Riverside Valley	11,040	4,008	40,080
Ludwell Valley	2,576	4,676	46,760
Belvidere Meadows	4,878	668	6680
Barley Valley	3,963	835	8350
Mincing Lake Valley	5,762	501	5010
Total	28,219	10,688	106,880

Cutting would be more expensive than grazing on all the sites other than Mincing Lake Valley. However the total cost of grazing is considerably cheaper than that of cutting. This may suggest that the costs for cutting supplied by the site manager were under-estimated.

The Future

The Countryside Service are optimistic about the future grazing management of its sites. However, they are unlikely to extend grazing to other sites at this stage. This is because they have reached a limit from a staff resource point of view.

Hampshire County Council

Hampshire County Council bought six Highland Cattle in 1998 to facilitate the grazing of several sites of conservation interest in the urban fringe areas of Southampton.

Table 46 Sites grazed by Hampshire County Council

Site name	Grid reference	Grazed area (ha)	Site status	Habitat	Stock used	Grazing period
Hacketts Marsh	SU 485089	21	SSSI, LNR	Coastal grazing fen/saltmarsh	Friesian X Hereford, New Forest Ponies	All year
Netley Common	SU 478118	16.19	SINC	Heathland	Highland cattle	Spring
Sandy Point	SU 748983	17.98	SSSI, LNR	Coastal Heathland	Highland cattle	Summer

Implementation of grazing

The Council decided to start small and purchase additional cattle only when there was a need.

Prior to making the decision to purchase the cattle the organisation carried out a feasibility study to identify the grazing needs of each Ranger Service within the Council and to consider the alternatives to grazing. Potential annual costs were estimated and the compatibility of each area with grazing in relation to urbanness etc.

The decision to purchase the cattle was supported at Committee and the funding provided by the Authority.

The following rationale was used within the Committee report:

"A considerable number of the countryside sites managed by the Countryside Service are maintained by grazing animals... Wherever possible, the Countryside Service has let the grazing to local farmers, under licence or short-term agricultural tenancy. However, following recent declines in the numbers of farm livestock, and due in part to the problems associated with BSE in cattle, it has proved increasingly difficult to find local graziers for some countryside sites. This situation is often compounded by the relatively poor or rough grazing provided on the conservation sites, isolation or urban fringe location and special conservation needs. Hardy, primitive stock suited to the vegetation and conditions on site are preferred to the more commercially popular

breeds favoured by most farmers. Consequently, it is impossible to get the right animals at the right place since the grazing and associated requirements are not attractive to commercial farmers. Without the use of grazing animals mechanical means have to be used which do not deliver the careful management required on sensitive sites". (Cuthbert, 1998).

Staff identified that the initial capital costs may be high but long-term the benefits of grazing to the wildlife interest justified the initial outlay. Also alternative mechanical management of the sites would be labour intensive and costly in terms of staff time and the results would not be so desirable.

The stock were purchased from a local farmer. Highland cattle were selected because of their breed profile and suitability to the habitat. Also the presence of long horns may act as a deterrent to vandals and dogs but provide an interesting feature for residents and site users. The main benefit of owning the grazing stock identified by the organisation was the ability to control the grazing regime and flexibility of the situation. No disadvantages sprung to mind other than an unfortunately high vets' bill in the first year due to bracken poisoning. It is felt by Officers that the considerable benefits to public relations and the financial and resource savings on labour outweigh the costs of establishment and implementation.

There is no intention to breed from the cattle or become involved in showing the cattle. The aim is purely to provide conservation grazing and it is thought that breeding would create additional burden and difficulties in relation to animal welfare and public use on the sites, in relation to added presence of calves.

Informal grazing without any grazing license has previously been allowed on Netley Common but there was pressure from within the council to tighten procedures. In particular, it was felt necessary to ensure that graziers held public liability insurance. Due to these changes the graziers were not interested in continuing. Netley Common is remnant heathland which is situated in an urban environment. Neighbouring the site is Council accommodation, private dwellings and also the Council- owned site for travelling people. There is a problem with litter and vandalism generally. The site is well used, by dog walkers in the main. The Council have owned the site since 1975 and reintroduced formal grazing in 1999. There are a series of fenced paddocks which enclose the open heathland areas requiring grazing. This constitutes approximately 30% of the site. The stock are rotated and are only present in one paddock at any one time. Results suggest that grazing every year for the three-month period may not be

necessary following the initial control of scrub. Public access to the grazed paddock is prevented during the grazing period. Access continues across the rest of the site uninterrupted. The total grazing period is three months maximum and the users of the site enjoy seeing the animals. The presence of the cattle has encouraged new visitors onto the site and generated interest in the other site management issues.

The cattle provide free autumn grazing for a Countryside Stewardship Scheme on private land and the cattle over winter on dry pasture adjacent to Hacketts Marsh LNR which is also privately owned. This autumn and winter grazing is a mutually beneficial arrangement for the authority and the landowners. Currently there is no formal arrangement with the landowner but a license was to be developed during the year 2000 to outline responsibilities. The stock are checked daily by the landowner and if any problem arises the Ranger staff are contacted. The dry pasture has no public access and the cattle are secured and rotated through a range of paddocks.

Hacketts Marsh is grazed by a farmer's stock, under licence. The annual income is not enormous but helps contribute towards the management of the site. The sward on this grazing marsh is good quality grazing and the farmer is keen to graze. This site was bought from a local landowner in 1992. Within the conditions of purchase there is no public access through the site and the stock are secure.

The conditions of the lease make the licensee responsible for temporary fencing, damage to existing fencing, hedges and trees. Also they are responsible for payment of water rates and charges during the license period. The grazing regime is determined within the licence and the council reserve the right to require rotation of the stock around the grazing parcels to suit the conservation objectives.

Animal Welfare

The cattle are checked by and are the responsibility of the relevant Rangers within the Countryside Service. The shared herd principle means the responsibility is shared between the staff at the Westwood Office and Hayling Island, depending on location of the cattle. Also within the Authority there are two farms which concentrate on commercial husbandry and do not become involved directly in the conservation grazing. However, they are called out if necessary to check the animals. The Ranger Service has a range of experience with livestock and further training has been arranged for staff with in house experts, local agricultural college, visiting other projects run by neighbouring organisations. The Regional Grazing Project set up in Hampshire

with the assistance of English Nature is also providing training on ecological aspects of grazing. The sites are checked by staff regularly to remove any hazards to the cattle such as litter or broken glass.

Local volunteers, principally dog walkers, check the cattle regularly and report any problems to the staff. There is a good network of local people who could be contacted and they are sent copies of the newsletter produced by the Countryside Service, keeping them up to date with management issues. There is a lot of enthusiasm for the stock from local people, particularly at Netley Common and Sandy Point where the Highland cattle graze.

The grazier at Hacketts Marsh is responsible for all animal welfare issues relating to his stock although staff are regularly on site to observe any problems.

Benefits of existing situation

The grazing management has, according to the site managers, achieved the objectives identified. At Netley Common the principal aim was to exert control over the birch which had encroached upon the heathland. Monitoring is carried out using local naturalists and staff.

The organisation believes that there have been significant benefits in terms of the amenity value of the site and the public image of the organisation as a result of the grazing scheme. This judgement is based on the support the Service has received and interest in the form of enquiries from local users and residents. The Highland cattle in particular prove popular because of their appearance. No method of assessment has been used but interest was shown in the future use of a visitor survey to monitor opinion.

Possible improvements

Expansion of grazing Scheme

There are other sites managed by the Countryside Service where grazing would be an appropriate method of management. This would necessitate the purchase of additional stock and increase the responsibilities of the Ranger Service. Currently there are no plans to expand the herd but in the long-term it would be desirable. There is no formal method of assessment used in relation to grazing sites. Risk assessments have been considered but it is difficult to assess the risks and in practice the grazing has worked

very well. The overall message was to implement grazing if feasible as the best form of management for the site in question.

Funding

Countryside Stewardship Scheme

Applications were made for Hacketts Marsh LNR and Netley Common which were rejected. In the case of Hacketts Marsh the reason for the unsuccessful application was that the site was already under optimum management and in prime habitat condition.

In the case of the Netley Common the application for C.S.S. was not successful because of different opinions on the appropriate way of grazing the site. The C.S.S. Project Officer wanted the perimeter of the site to be fenced and for grazing to be implemented across the whole site. The site manager wished to graze the site selectively using enclosed areas within the Common. The reasons for this included consideration to the users of the site, principally dog walkers, potential vandalism to the perimeter fence would place the stock in a dangerous situation with adjacent road, housing and the travellers' site, where the existing boundary fence is regularly removed. The site, in particular areas of woodland fringing the site, is important for a rare invertebrate species and grazing would be detrimental to the habitat supporting the invertebrate interest. Expert entomological advice was sought through a survey.

Sandy Point is managed by the Hayling Island Rangers and receives C.S.S. to support the grazing management.

Netley Common has subsequently been part of a successful regional five-year National Lottery Bid "Heathlands for Tomorrow" and will receive between £3000-£5000 per annum for management, interpretation and access provision.

Hacketts Marsh grazing licence generates an income of £500 annually.

The stock, as non breeding heifers, are not eligible for current Suckler Cow Premium and Beef Premium subsidies from DEFRA.

Capital and Annual Costs of grazing

The purchase of six Highland cattle cost £900 in 1998. The Service commissioned a portable cattle crush from an engineering company to allow the cattle to be managed on site, for £2073. The other capital costs were site based and include fencing, water supply, handling compounds and safety work.

The County Council provide an annual budget of £2000 to manage the stock, this pays for vet bills, equipment and purchase of stock. This figure will increase annually.

Table 47 Capital Cost of grazing £

Item	Hacketts Marsh	Netley Common	Sandy Point
Stock	-	450	450
Water supply	150	100	500
Fencing/boundary	5000	4000	4000
Handling facilities	2250	250	250
Safety work on site	100	150	100
Total	7500	4950	5300

Table 48 Annual cost of grazing (£)

Item	Hacketts Marsh	Netley Common	Sandy Point
Supervision of stock	677	406	812
Vets Bills/animal welfare	100	100	100
Haulage	2 days	2 days	2 days
Maintenance of boundary	200		
Water supply	-	-	50
Total	977	506	962

Annual Income

The only annual income identified to support the grazing management was the grazing license for Hacketts Marsh £500 and the Countryside Stewardship Scheme for Sandy Point.

Alternative Management

Grazing is the most appropriate method of managing the sites, and is less labour intensive than the alternatives. On Netley Common the main management is to control the level of scrub within the heathland. Prior to the reintroduction of grazing the staff

had manually cut the scrub and treated the stumps with Round up. This proved to be very labour intensive and not efficient in terms of staff time.

Hacketts Marsh is a grazing fen/marsh and has been historically grazed for centuries. Selected areas are cut for hay by the grazier under the same licence. However, the grazed areas are a SSSI and under management restrictions from English Nature.

The costs of managing the land by grazing or other methods, principally cutting, were considered as part of the feasibility study. It was felt that the ecological benefits of grazing were unquantifiable and outweighed the relatively low capital costs of grazing.

The capital and annual costs for cutting provided within the Questionnaire were based on the purchase of a mini hay baler and cutter and of staff time implementing the work However the practicalities of cutting the heathland sites is questionable and would not achieve the objective of controlling the scrub.

Comparison of grazing and cutting costs over ten years

The tables below illustrate the costs estimated by the organisation for grazing and cutting and the standard contract price from the *Agricultural Budgeting Handbook* 1999 (Agro-business Consultants, 1999), over a ten year period. The costs are adjusted to present-day value using a 6% discount rate.

Table 49 Comparison of estimated grazing and cutting costs (£) over ten year period

Site	Grazing cost				Cutting	estimated cost	
	Capital cost	**Annual cost**	**Annual Income**	**10 year period**	**Capital cost**	**Annual cost**	**10 year period**
Hacketts Marsh	7,800	977	500	11,311	3,313	900	9,937
Netley Common	4,950	506	-	9,996	3,313	500	6,993
Sandy Point	5,300	962	-	13,702	3,313	700	8,465
Total	17,750	2,445	500	35,019	9,939	2,100	25,405

Table 50 Comparison between grazing cost and agricultural price for hay cutting over a ten year period using standard contract price *from Agricultural Budgeting Handbook* 1999.

Site	Grazing cost	Standard contract price for cutting	Standard contract price for cutting
	10 year	**Annual cost**	**10 year period**
Hackets Marsh	17,270	1,352	13,519
Netley Common	10,010	1,501	15,013
Sandy Point	14,920	1,754	17,535
Total	42,200	4,607	46,067

Using the costs estimated by the site manager it would be cheaper to cut the sites annually than to implement grazing in the current way. However this cost does not reflect the added value to the wildlife interest of grazing or take into account the opinion that grazing is more suited to the site conditions and habitat.

When compared to the standard cost of hay-cutting using a contractor, grazing is cheaper over a ten-year period, for two of the sites. However, bearing in mind the nature of the sites, hay cutting is not necessarily directly applicable.

Rotherham Metropolitan Borough Council

The Countryside Project Unit is responsible for managing the sites of conservation interest within the Borough that are Council-owned. These include wetlands, grasslands and woodlands. The aims of the Council include providing local people access to their immediate countryside for leisure and educational use. The sites are therefore managed for their wildlife and amenity value. The identification of locally important grasslands and wetlands and subsequent development of management plans, LNR designations and securement of grant aid ensures a sustainable approach to managing these sites. The unit also works in partnership with other local landowners, assisting in management for wildlife and grant applications.

Implementation of grazing

The Land manager currently utilises the Council's own Livestock Unit, based at Rother Valley Country Park. This was established in the late 1980's to provide conservation grazing for the Country Park. Grazing around the Borough began in 1996. Subsequently the Livestock Unit has developed, through an improved breeding programme and careful selection of appropriate breeds. The stock also provides

grazing for several other organisations in South Yorkshire. The livestock are regularly shown at several notable Agricultural Shows and have won many of their classes, bringing well-earned attention to the success of the local authority.

Grazing was originally limited to the Country Park, but in 1994 the Unit leased the grazing on Woodhouse Washlands, a Yorkshire Wildlife Trust reserve. The Unit has continued to graze this site in subsequent years, paying an annual fee.

The extension of the grazing project to sites of conservation interest around the Borough of Rotherham followed in 1997. Management plans developed for several of the Local Nature Reserves prescribed grazing at various livestock densities and at different times of year. The grazing management is partly supported by the Countryside Stewardship Scheme, administered by DEFRA.

In total the stock unit now graze wildlife sites for four organisations, in addition to Rother Valley Country Park.

Table 51 Sites grazed by stock owned by *Rotherham Metropolitan Borough Council.*

Site name	Grid reference	Site status	Grazed area (Ha)	Habitat	Stock used	Grazing period
Firsby Reservoirs	SK 495958	LNR	6.5	Wetland	Highland cattle	Apr-Nov
Keppel's Field	SK 390948	LNR	6.5	Neutral / acid grassland	Highland cattle	Aug-Feb
Grange Park	SK 390939		12	Neutral grassland meadows	Highland and Hereford cattle	Aug-Feb
Kilnhurst Ings	SK 467976		15	Floodplain grassland	Hereford cattle	All year
Meadowgate Lake and Barbers Meadows	SK 458820		21	Wet grassland, Neutral grasslands and tall herb fen	Highland cattle and Hebridean Sheep	Late July-March

Firsby Reservoirs LNR

Grazing was introduced in 1996, initially at a density of one Livestock Unit (LSU) per hectare during the autumn. After the first year the grazing regime was reviewed and the stock were on site for nine months at a lower density of 0.5 LSU /ha. Highland Cattle

were used to provide foraging across the grassland and wetland areas, with the main objectives of vegetation restoration and management of the tall herb fen and shallow marsh communities. This breed is ideal for the site conditions and are hard grazers, ideal for the rank mesotrophic grasslands and fen vegetation. The stock used were two/three year old heifers.

Keppel's Field LNR

Grazing was introduced to this site in 1997. A third of the whole field is grazed, the remainder is cut for hay. The site is used regularly by the local population as well as by visitors from further afield. Zonation of grazing was implemented to reduce potential conflict with other users by providing stock-free areas within the site.

Highland cattle have been used for the same reasons as before - the breed being hardy and ideally suited to the ranker areas of mesotrophic grassland. They will exert control over the scrub development within the site.

This part of the field had been left unmanaged for several decades, unlike the remaining flatter, drier grassland areas, which have been managed by a single cut each year. Grazing will provide a gradual restoration of the grassland offering an alternative sward structure to the cut areas of the field. The field is important for several species of butterfly, including Small Heath, Meadow Brown, Small Skipper and Dingy Skipper and the sward structure is crucial to their continued presence.

Grange Park

Grazing was introduced to two meadows within this historic parkland, in 1999. The meadows had been cut for hay annually in August for at least eight years. Grazing was introduced with the aim of improving the structure and composition of the sward, which had become very uniform and dense.

Cows and heifers graze the site, both Highland cattle and Hereford cattle are used.

Access is available through the meadows with self-closing gates provided. The area is regularly used by local people, particularly dog owners.

Kilnhurst Ings

The site's importance to wildlife, and the Council's desire to secure future appropriate management of this floodplain grassland, led to the local authority leasing the site from the Environment Agency for an initial ten years. The hay had been cut for silage and grazed by horses for several years and the original wet grassland and ground nesting bird population was in danger of being destroyed by inappropriate management. Grazing was introduced to the Ings in 1998.

Hereford cattle were selected as a suitable breed, the sward is quick to grow and nutritious, providing a good diet. Cows and heifers graze the site, throughout the year, with a bull running with them during late summer. A stocking density of 1LSU/Ha was implemented but revised to 1.5-2 LSU/ha outside the breeding bird season, to exert control over the fast growing sward. *Rumex* sp and *Urtica dioica* control has proved necessary in areas previously heavily poached by horses and feeding areas.

The site is a controlled washland so the positioning of stock fencing was restricted to the perimeter and not along the river. Highland cattle may have ventured into the river. Herefords were specifically purchased for foraging on this site. Water is available on site from the ditches; however, the source is unknown and fresh water is supplied from a water trough.

Access is freely available across the site. However, most people keep to the floodbank.

Meadowgate Lake and Meadows

This is the nature reserve situated within Rother Valley Country Park. This proposed LNR has been grazed since the establishment of the Livestock Unit. In the last five years it has been seriously overgrazed by Highland cattle, with several of the tree plantations suffering badly. Supplementary feeding on site has created areas of dock and nettle. The site is now entered in the Countryside Stewardship Scheme and a management plan outlines the recommended grazing regime. The waterside grasslands provide a good breeding habitat for wading birds and thus are grazed from mid- July to April, outside the breeding bird season.
The Meadows adjacent to the lake support relict valley mire and mesotrophic grassland and are grazed at a density of 1LSU/ha from July to April.

Public access within the nature reserve is not permitted, therefore there is no direct contact between local people and the stock.

Benefits of grazing

Grazing was introduced on the sites for the following reasons:

- Provides a range of sward conditions for a variety of invertebrate, bird and mammal species.
- It is a sensitive, gradual form of management.
- Historical management for several of the sites.
- Restoration of vegetation and control of scrub.
- Best suited to the vegetation type.
- Best management suited to the site conditions
- There was an available source of stock owned by the managing organisation.
- High cost and impracticality of alternative cutting management.

In addition re-introduction of grazing brings the concept of livestock and agricultural land management back into the urban fringe areas of the Borough and has increased both the local residents' and countryside users' interest in the sites. The cattle have encouraged local people to understand the need to manage grasslands and wetlands.

Monitoring the results of grazing

Annual monitoring of the grassland sward in terms of species frequency, diversity and sward structure is carried out on all the sites where grazing is implemented. Keppel's Field LNR, one of the first sites to be grazed, is, after three years of autumn grazing, showing a definite improvement in the quality of the sward. This is evident from monitoring and comparison with adjacent control areas which are unmanaged.

The more competitive tussocky grasses are reduced with other, finer, grasses and flowering herbs such as *Cynosaurus cristatus* and *Lotus corniculatus* having an opportunity to flourish. The cattle control the spread of scrub on the field, reducing the need for manual control. Similarly at Firsby Reservoirs where the grasslands and shallow marsh areas were becoming rank and losing their botanical diversity, there has been a noticeable improvement with a mosaic of sward height and densities and a wealth of flowering plants characteristic of unimproved acid and neutral grassland.

Alternative methods of management

The only alternatives to grazing the sites in Rotherham would be to:

- Leave the grasslands unmanaged
- To cut the grasslands either wholesale or on rotation.

Apart from the ecological disadvantage of cutting to these particular sites, the ability to cut varies. It is unlikely that the objectives of management could be met in terms of promoting biodiversity by cutting. The ecological benefits of grazing would be impossible to replace.

The alternative to grazing the reserves would be to manage them by cutting, however the practicalities of this vary between sites. In some cases such as Grange Park the meadow is already cut and sold as hay by the Livestock Unit. Grazing was implemented to provide much needed aftermath grazing to improve the sward structure and wildlife interest of the grassland. Similarly Kilnhurst Ings used to be cut for hay and grazing was introduced to create a more varied sward and encourage the botanical, entomological and ornithological interest of the site. The site could be cut easily and an income could probably be generated.

On other sites like Keppel's Field, Firsby Reservoirs and Meadowgate Lake, cutting is not practical because of the physical nature of the site and because of the damage it would cause to the wildlife interest of the site. These three sites could not be managed as effectively to produce the desired outcome in terms of biodiversity by any other management method.

Benefits of existing situation

Owning livestock allows for flexibility in the grazing regimes. The breed of stock can be selected to suite the site conditions and habitat-type. The use of breeds like Highland cattle has proved very popular with local people and have created interest in the management of the sites. Grazing is currently easier to implement because of having a ready supply of stock. There are few livestock farmers near to the sites. Use of an external source of stock would require a grazing licence and would be more complicated to administer. It is unlikely that suitable breeds would be available for most of the sites.

Disadvantages of existing situation.

The Livestock Unit is frequently under threat when budget savings are required. The security of the grazing schemes are currently dependent on the organization's own livestock and alternative sources are likely to be difficult to find. The political support for the Programme is limited, as it is not seen as a priority for Council resources. The Livestock Unit is not managed by the team responsible for managing the conservation sites but is linked to the Country Park where it is based. There is considerable friction in relation to running costs of the Unit and which area of the Service should cover the cost. The importance of the conservation grazing schemes around the Borough is not fully appreciated by the Country Park and their main objective is to manage the Park itself.

Currently the Council, as part of its budget cuts for 2001/2002, is proposing to sell the livestock and associated capital items and to re-deploy the staff. This has been delayed because of the foot and mouth crisis. The implications on the existing grazing schemes is likely to be substantial. There are few alternative sources of suitable stock within the Borough and securing appropriate grazing on these sites is likely to be problematic. Ultimately the decision will undermine many years work and considerable capital investment both in the Livestock and the reserves. Also if grazing cannot be implemented there will be loss of income in the form of Countryside Stewardship Scheme payments.

Finance

Costs of grazing

Capital Expenditure

The main expenditure for the management of the sites around the Borough was the erection of stock fencing and the provision of a water supply to the enclosure. The capital costs of setting up the schemes were supported by grant aid from the Countryside Stewardship Scheme and the Countryside Agency. The annual running costs of the Stock Unit are met by the Local Authority, through Rother Valley Country Park. Income is generated by the sales of livestock and various subsidies and the sale of hay crops.

Table 52 Capital cost of grazing

Site name	Stock	Water	Boundary	Safety works	Vehicles	Total
Firsby Reservoirs LNR	1673	0	1950	600	1500	5,723
Keppel's Field LNR	1673	1980	4926	5000	1500	15,079
Kilnhurst Ings	1673	2000	2510	0	1500	7,683
Meadowgate Lake	1673	160	14000	0	0	15,833
Grange Park meadows	1673	1600	9085	0	1500	13,858
Total						**58,176**

In total nearly £60,000 has been spent on establishing conservation grazing on the sites. This does not include the considerable amount of Officer time involved in co-ordinating the implementation of the Programme. Nor does it include the direct costs of the Livestock unit, which was well established. This cost represents an investment in respect of the future management of the site. The facilities created to support grazing will last for up to ten years.

Annual Costs

The annual costs of managing the sites includes boundary maintenance and water supply and ragwort control.

The annual running costs of the livestock unit include salaries, overtime and mileage, machinery hire, and livestock insurance. However, there is a cost in the supervision of the animals out on site and the additional work necessary to ensure their welfare.

Table 53 Annual cost of grazing

Site name	Staff	Boundary	Water	Notices	Total
Firsby Reservoirs LNR	4062	200	0	0	4262
Keppel's Field LNR	1482	100	100	5	1687
Kilnhurst Ings	4762	400	0	25	5187
Meadowgate Lake and meadows.	4062	0	0		4062
Grange Park meadows	1484	200	100	20	1804
Total					**17,004**

Income linked to grazing

Countryside Stewardship Scheme

All the reserves which are currently grazed by the Livestock Unit are within the Scheme. Countryside Stewardship offers an annual payment to support the grazing of

Discussion

Survey Methodology

The survey methodology applied was a targeted survey of all the grazed urban/urban fringe sites in the UK. Some participants responded to a variety of advertisements/articles. Others were contacted via the Wildlife Trust list, the *Grazing Animals Project* mailing list, English Nature local offices and through word of mouth.

It was felt that the results obtained from 31 organisations across the country provided a representative profile of the target study group. This was primarily site managers across the country who are grazing sites within the urban or urban fringe countryside.

By nature of the contact made, most people who wished to participate in the survey were implementing grazing and so Questionnaire A was relevant. Within this questionnaire, there was opportunity to say whether additional sites managed by the organisation would benefit from grazing and what were the constraints, which prevented this occurring. As a result Questionnaire B was not necessary for most organisations responding to the survey. The two organisations that did complete the Questionnaire B were not grazing any sites but either had in the past or would like to in the future.

Cost-effectiveness of grazing schemes

The financial cost of the grazing schemes varied considerably. The source of livestock utilised by the different organisations had implications for the overall cost as well as the effectiveness of the schemes and the level of benefits perceived. The way the organisations are implementing grazing is directly relevant to the financial cost of a scheme.

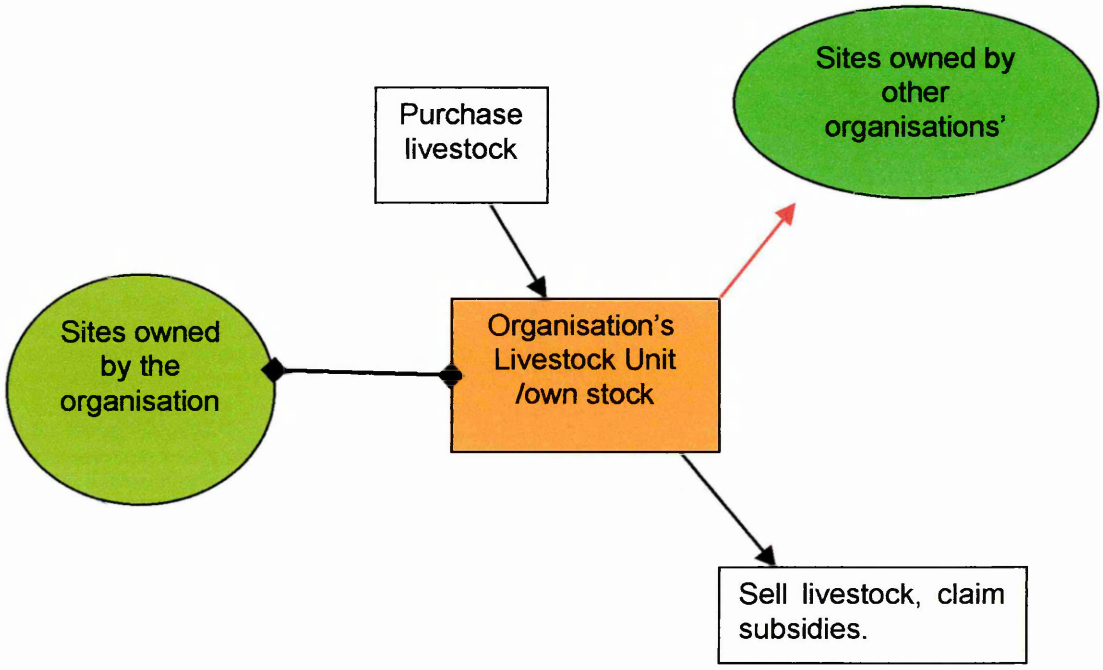
How grazing is being implemented in urban/fringe countryside

Grazing is being successfully implemented on sites within urban or urban fringe settings, by conservation/ countryside management organisations across the country. Local Authorities made up over two thirds of those responding to the survey. They play an important role in nature conservation and land management within the urban/urban

fringe environment, where they can be a major landowner (Rotherham, 1994a). The effective management of sites of conservation interest will form part of the service provided for the local community.

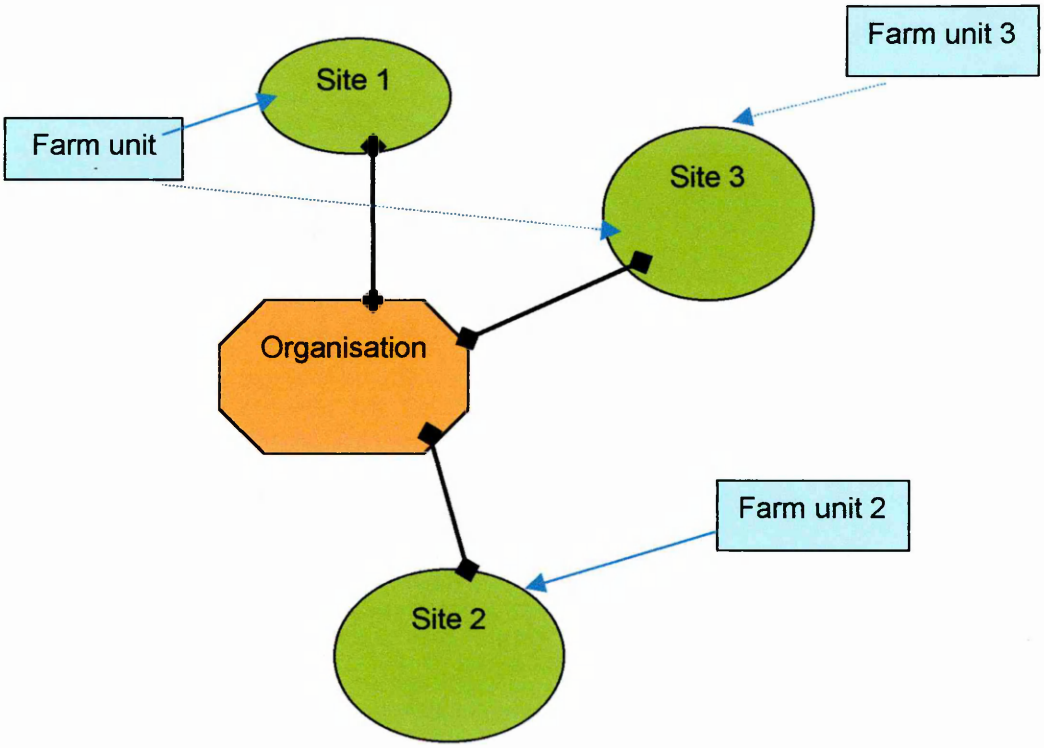
The following four models represent the responding organisations approach to achieving grazing. The schemes illustrate the flexible approach adopted to implementing grazing within urban/fringe areas.

Model One



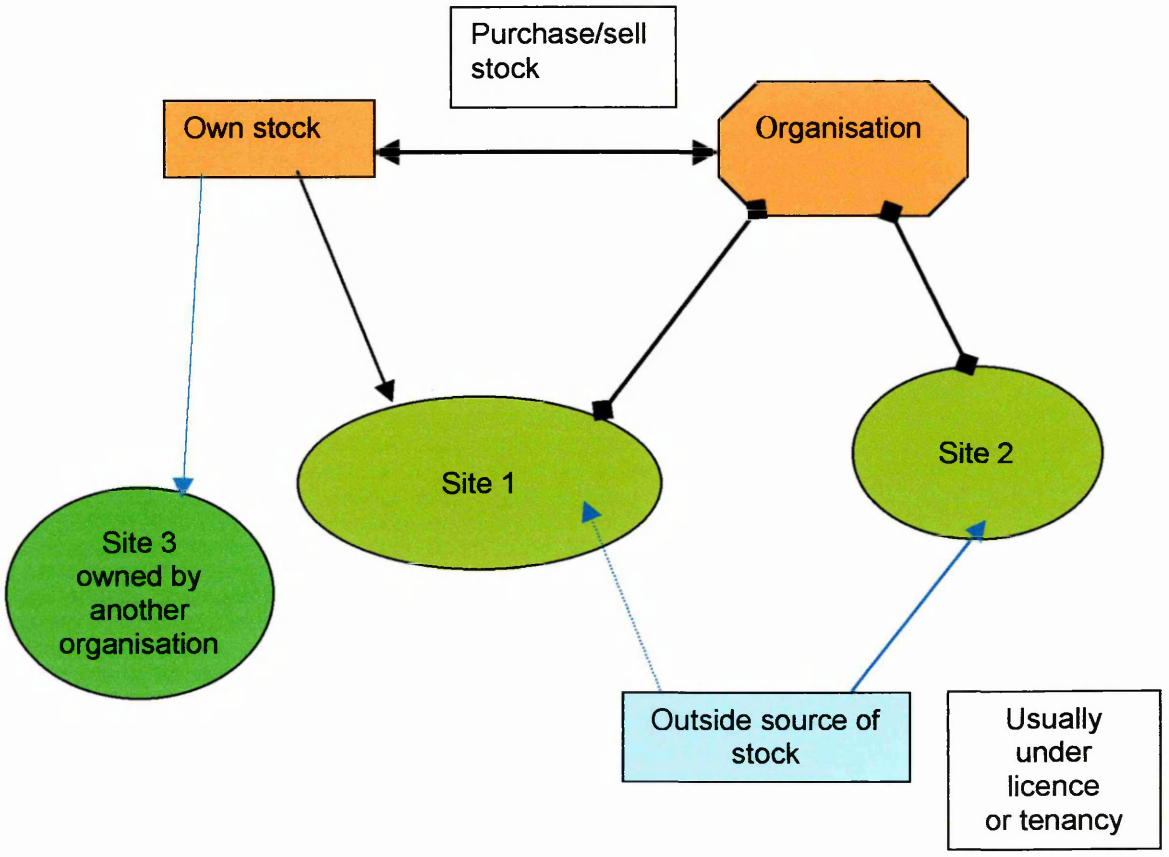
The organisation's own stock graze their own sites e.g. Nottingham City Council, and sometimes-other organizations' sites as well: e.g. Rotherham Metropolitan Borough Council.

Model Two



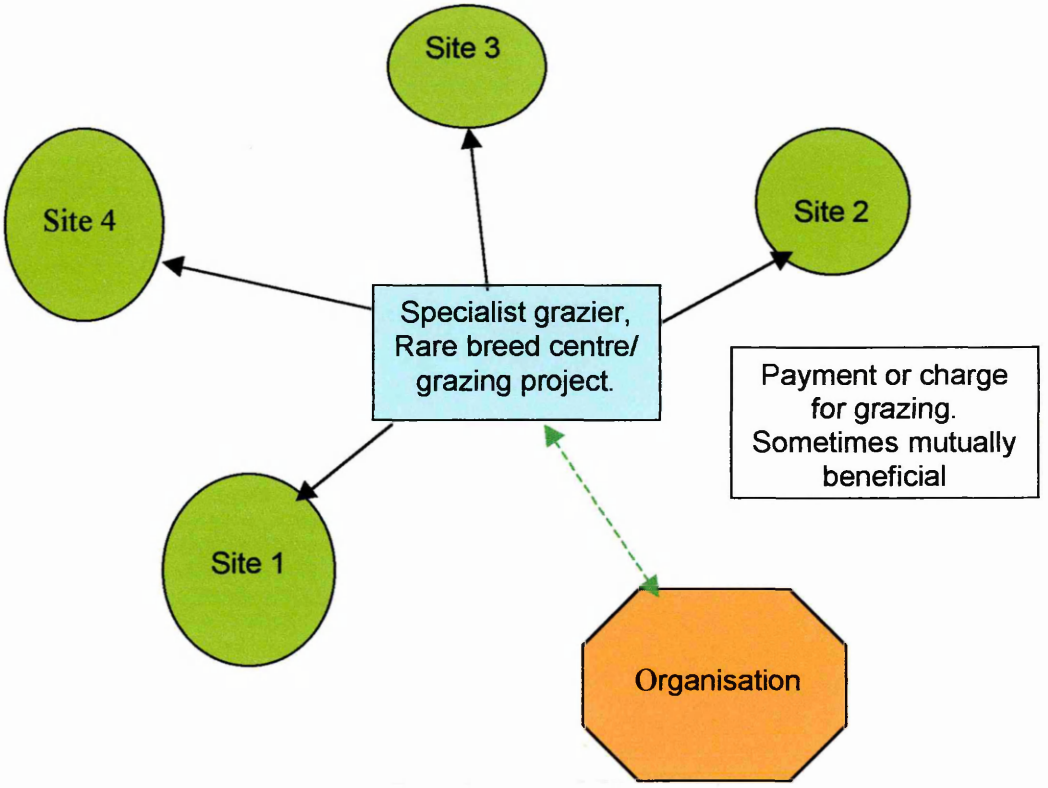
A different farmer grazes each site managed by the organisation or the same farmer may graze more than one site, e. g. Exeter City Council.

Model Three



An organisation's sites are grazed by their own stock and an outside source of stock e.g. Birmingham City Council where the two sites are managed with different stock sources. Also Sheffield City Council where out of the five sites, two are grazed with the Council's own stock and the rest with a local farmer's. Hampshire County Council graze several sites with their own stock and one with a combination of own and outside source of stock

Model Four



This is where grazing is supplied by a local enthusiast/ specialised breeder rare breed centre eg. Sheffield City Council or in the case of Reigate and Banstead Borough Council, a conservation grazing project.

Costs in relation to source of stock

Owning stock in order to provide conservation grazing requires both capital and revenue investment by the organisation. There are the capital costs of purchasing the stock, housing and vehicles together with the individual site capital costs. This varies depending on the scale of the scheme. Annual revenue will be required for staff resources, animal welfare, feed *etc* as well as for individual site maintenance. Stock selection may well reduce some costs, particularly if the animals are hardy and stay on site throughout the year.

Organisations using an outside source of stock do not necessarily have the same requirement for capital investment. For those organisations who provided cost

information, all met the initial costs of fencing the sites and, where necessary, those for installing a water supply. The grazier meets capital and annual costs in relation to the stock and its welfare.

For some making use of an external source of stock there were no capital costs because the boundary *etc* was already secure, water was present on site and there were no stock related costs. Others were unaware of any capital costs, particularly if grazing had been implemented for several years. Annual costs were identified for several of these sites for boundary maintenance, water supply and interpretation.

Sites managed by a farmer's stock generally had lower annual costs than those using their own stock to provide grazing. This is probably because the organisations pass an element of the cost, particularly those linked to stock and staff resources, onto the grazier. In some cases, grazing licences may also require the grazier to either erect or to at least maintain the fencing or boundary and water supply. However, it appears that most of the organisations funded boundary provision and maintenance. Exeter Countryside Management Service provide that service to encourage local graziers to graze the land and they see it as their duty because of the level of public access.

Constraints

Availability of livestock in urban fringe environment

Availability of stock poses significant constraints on organizations ability to graze sites within the urban fringe.

Increasing urban influence on the urban fringe environment, during the last century, has led to a decline in agricultural land use and in particular livestock farming. Many organizations either have to purchase there own stock or rely on modern farming to provide grazing.

Some cities like Exeter have a good source of local farmers' to graze their sites whilst other organisations including Hampshire County Council and Birmingham City Council have found difficulty sourcing livestock for their sites in the urban fringe.

The source of stock available to an organisation may limit the effectiveness of the grazing management. Where a farmer's stock is the only available resource there is frequently no choice over breed or suitability of the stock to the site or type of habitats

requiring grazing. With commercial farm breeds, frequently continential, there are the real issues of whether the animals can cope with the grazing available on unimproved habitats and also therefore how effective the grazing will be in achieving the objectives of management (Grayson, 1997).

The Impact of Foot and Mouth Epidemic on conservation grazing.

In the short- term this situation may well worsen with the recent BSE and Foot and Mouth epidemics. Availability of stock in lowland areas is likely to be restricted in some areas of the countryside where livestock have been slaughtered or where farmers may be encouraged to convert to arable land (Everett, 2001). There may well be a reluctance by farmers to graze land outside their own holdings, to reduce the chance of contracting foot and mouth. This would be particularly relevant if public access is permitted within the sites, which is likely to be the case in an urban fringe setting. In addition, restrictions on animal movement may pose obstacles to this process.

Managers of sites may also choose not to graze, particularly if objectives of management include recreational facilities or the sites are heavily used by members of the public. The epidemic of Foot and Mouth will have led to closure of many conservation sites, in particular those with stock with possible loss of income. This would be particularly relevant at some urban sites such as Country Parks where revenue from visitors may form a significant income to the managing organisation.

Alternatively with recent incentives within the Rural Development Programme there may well be a shift in emphasis towards more sustainable, agri-environment agriculture. The Countryside Stewardship Scheme is an important source of support for the grazing schemes studied and large increases in this budget are proposed (Grayson and Beech, 2000).

Suitability of available stock

Managing organisations did not perceive any negative impact on the conservation of the habitat-type in relation to the source of stock, although suitability of available stock was raised as a constraint for a quarter of the organizations. In fact it is of almost equal concern to those that owned their own stock as to those organizations using external source of stock. For the former organisations if different habitat-types/sites demand a different breed to that already owned, then grazing that site would be dependent on either purchasing additional stock or finding an outside source of stock. For the latter

availability of stock may be the main constraint regardless of suitability, which would be the secondary concern.

Similar research by the *Grazing Animals Project* supports this argument. One of the main reasons for selection of stock type was that the stock belonged to a local farmer. In addition it was identified that over a third of the respondents would prefer to use a different breed of stock if it were available (Small *et al.,* 1999).

Selection of livestock breed or type

The organisations owning stock were able to select the breed and type of stock according to their breed profiles and site conditions. The major criteria used for selection were the breed/stock characteristics: including hardiness and ease of handling; whether the stock were a rare breed or had historically grazed the site; and thirdly popularity with local people: attractiveness and nature. The last is particularly important in an urban setting where the support of local residents and regular site users is fundamental to the success of a grazing scheme.

Where selection was based on breed profile characteristics, the main criteria used were temperament, hardiness and traditional breed. Similarly Small *et al.* (1999) identified these as the most frequent reasons for choice of livestock. In total they listed twenty six reasons which included rare breed and "*for public/display and appearance*" (Small *et al.,* pp46) acknowledging the other benefits the stock can play in addition to farming or conservation objectives.

Animal welfare and supervision

Supervision of the stock was a constraint for over half of the organizations, in particular those utilising an outside source of stock to implement grazing. More organisations utilising an external source of stock identified the constraints often associated with public use than organisations utilising their own stock. This may be explained by possible reluctance of local farmers/graziers to graze sites because of the perceived problems, whereas organisations with their own stock and resources may find supervision and associated animal welfare issues less of a constraint.

Cost as a constraint.

Cost was identified as a constraint by over a quarter of the organisations; this was expressed as a greater constraint by those that owned their own stock, presumably

because of the additional demand grazing further sites would place on the organisation's resources. It could be argued the expansion of the resource might provide additional income in the form of subsidies and sales of stock in the long-term. However, for organisations such as Hampshire County Council which only owns six Highland cattle, enough to provide the grazing currently required, expansion of the stock would involve additional staff resources and change the emphasis of the project. Similarly for Rotherham Countryside Service where there is a large stock unit, the main issue limiting expansion is again pressure on staff resources. In this case the existence of the Unit is frequently under threat because of local authority budget cuts. It is seen as an appropriate way of saving money without impacting on essential services like education. The Unit is seen as an unnecessary expense partly because of lack of understanding and commitment, by senior officers and members, to conservation and ignorance of the benefits of grazing to the biodiversity of the Borough.

For organisations utilising outside stock the cost and resource implications are passed onto the farmer. However, this may explain why supervision of stock and availability of stock are raised as issues for these organisations. Farmers may not be prepared to put in additional resources to ensure good animal welfare practice or to provide stock suited to the sites and vegetation communities.

Constraints related to public use

Organisations were asked to identify any real as opposed to perceived issues that they had encountered with their urban grazing scheme. The expected list of problems including vandalism and dog walkers appeared although the number of organisations experiencing each was minimal.

In comparison, the problems identified by GAP 1999 survey, studying grazing schemes in both rural and some urban environments, included public reaction, resistance and perception, public access, dogs, fencing (either cost of or vandalism to) and in addition obtaining suitable stock and grazier availability (Small *et al.,* 1999). This illustrates that the issues often considered to be associated with grazing in more urban areas are actually of concern to site managers generally regardless of the location, urban or rural. Public related problems can be overcome by careful selection of breed, good interpretation and communication with the public (Read, 1997).

Easier access to the wider countryside has led to a wider variety of public uses. Areas which are rural are more accessible by car and National Parks *etc* will be subjected to visitor pressures equal to, if not exceeding, urban fringe countryside.

The perceived level of constraints will influence the organisation's assessment of whether a scheme is viable. The greater the demand on staff / organisation resources the less viable. Thus it is important to assess the scheme realistically. There will always be sites both urban and rural where grazing will not be viable for a variety of reasons. However, feedback from respondents illustrates that although many of the perceived constraints do exist, the grazing scheme is running effectively. The problems are controlled through good supervision and maintenance, publicity, interpretation and access. Hampshire County Council illustrates the benefit in carrying out a feasibility study to consider all the issues and ways of addressing constraints.

Cutting as an alternative management method

Cutting is the other widely used grassland management method. To consider whether grazing is a cost-effective method of management it is necessary to compare it with the costs and benefits of cutting.

Cutting was the principal alternative management considered by managing organisations, either for hay, amenity use, or rotational cutting. It was occasionally considered alongside abandonment and burning.

Feasibility of cutting was an issue with the majority of organisations. The fact that they are now implementing grazing presumably suggests that grazing was considered more appropriate than cutting. The reasons given for selecting grazing related to the site conditions and practicalities, ecological benefits and historical continuity.

Organisations that stated they had not considered an alternative method had very clear reasons for why grazing was selected over cutting. In particular, if grazing was the historical management method for a site, or site conditions and type of vegetation suggested that grazing was the only practical way to manage the site, other management methods were not considered. Table 57 illustrates the main benefits and disadvantages of these two methods of management.

Table 57 Summary of the disadvantages and advantages of grazing and cutting

	Advantages (Benefits)	Disadvantages (Costs)
Grazing	Historical/traditional Sustainable/ecologically best for the site Public attraction/ traditional breeds. Provides varied sward structure Practical Provide habitat for other species. Unaffected by site topography, conditions. Wide range of breeds suited to different habitats. Good public relations exercise	Conflict with public use Need for fencing. Overgrazing can cause undesirable ground conditions and species. Bad grazing can given negative image.
Cutting	Useful on sites that cannot be grazed None of the issues associated with grazing with livestock. Traditional method of management of Hay meadows.	Does not create mixed sward conditions. Can be damaging to invertebrates. Difficult to implement if site conditions are difficult - impractical. Labour intensive

Estimated costs for cutting as an alternative method of management

The responses from the survey indicate the difficulty managers have in either providing costs (presumably because they do not have accurate figures for cutting), or because they have never implemented that management technique on these particular sites. Cost was considered as a reason for grazing instead of cutting for a fifth of the sites, presumably because other methods such as cutting would prove to be more expensive.

Where estimated costs were provided for cutting the sites, they varied considerably. This reflects the difficulty site managers face in estimating costs for management that may not be suited to the site. The widely varying differences between the estimated cutting cost and the contract price for hay cutting suggests that the estimates were not necessarily reliable. Responses to other questions indicate that factors such as site conditions would increase the cost above the standard contract price for cutting. This is generally based on a flat, accessible grass field for hay. For several sites this was the case, with the estimated cutting costs being considerably higher than the contractual cutting rate.

If cutting had not been implemented previously, there would be nothing on which to base an estimate other than an individual's experience with other sites. Some

managers stated that there would be a need for special machinery or that the costs were estimates. Topography and ground conditions affect the ability to cut with machinery and may increase the cost. For many of the organisations which identified these two constraints on cutting, cost was a further factor considered.

Comparisons of cost for grazing and cutting

The information provides an indication of the site manager's cost assessment of both types of management.

The capital costs of grazing the sites were higher, in all but one case. The majority of sites had no capital costs for cutting estimated, only annual because a contractor would be paid to cut.

Organisations estimated the annual cost of cutting to be more expensive than the annual cost of grazing for half the sites, possibly reflecting the site conditions and the practicality of cutting.

Financial appraisal

The financial appraisal illustrates the comparative costs estimated by organisations to implement grazing or cutting on the sites they manage. However, the fact that only 31% of the organizations could provide comparative costs is in itself interesting. This suggests that costs and income are not the principal objective for the organisations and that details of expenditure have not necessarily been recorded over the years.

Comparative costs for grazing and cutting in relation to source of stock and the impact of different time horizons.

Evaluation of the two methods over the three time horizons suggests that grazing can be less expensive than cutting if an external source of stock is used. However, for an organisation using its own stock, grazing is likely to be more expensive than the alternative method of cutting. This was only the case in half of the sites, over the ten-year time horizon. It would be cost-effective to graze those sites which have a high annual cost of cutting because of site conditions.

Non-marketable benefits

The costs and benefits of the two methods of management cannot be valued in monetary terms alone.

Grazing had a reported major benefit to the conservation of the habitat, amenity value of the sites and public relations of the organisation. In only a few incidences was there a negative impact on the organizations in terms of amenity value and public relations. Generally the benefits were positive.

When further analysed in relation to source of stock, organisations using their own stock perceived greater benefits to amenity value and public relations, than those using an external source of livestock. The reported negative impacts were only associated with the latter.

In addition to this organisations identified many reasons why grazing was selected over cutting for their sites. Many of these can be translated into benefits of grazing over cutting and the constraints in relation to site conditions which would make cutting difficult.

Table 58 illustrates the monetary and non-marketable costs and benefits of grazing and cutting. These are dependent on the method of implementation. Different costs and benefits are experienced in relation to source of stock and methods of cutting.

Table 58 Costs and benefits of grazing and cutting

	Costs	Benefits
Grazing		
Own stock	Capital cost of stock and facilities	Subsidies
	Annual costs-stock	Sale of stock. Breeding programme/ showing stock.
	Capital costs in relation to the site/s	Grant aid linked to management
	Annual costs in relation to the site/s	Select breed/type of stock to suit site and public.
	Animal welfare responsibility	Flexibility of grazing regime.
	Long-term commitment required from managing organisation	Can graze sites that may not be attractive to commercial farmers.
	Staff resources.	Objectives are primarily related to conservation and commercial production is usually secondary.
		Can take into account other benefits in relation to type of stock: public attraction.

		Good PR for organisation, locally and within the conservation network.
		Flexibility in approach to public access.
		Can graze sites of other organisations – possible income or cost.
External stock	Annual cost – possibly staff resources	Grant aid linked to management, occasionally passed on to grazier.
	Capital cost in relation to site/s	No animal welfare responsibilities for the organisation.
	Annual costs in relation to the site	Can pass on responsibility for site maintenance related to the grazing.
	Administration of licence/ tenancy agreement.	Income from grazing licence.
	No income from the stock	Provide grazing for local farmers, supporting farming industry.
	Objectives of managing organisation are different from grazier	Promote understanding and partnerships between local farmers and countryside managers.
	Grazing period may be fixed and therefore less flexible grazing regime	
	Reliant on availability of suitable graziers	
	Stock suitability to site conditions and vegetation	
		.
Specialist grazier.	Capital cost in relation to site/s	
	Annual costs in relation to the site	Traditional/rare breeds better suited to habitat
	Administration of licence/ tenancy agreement.	Possible added amenity value because of type of stock.
	No income from the stock	Link/interest in conservation
Cutting		
	Capital cost of machinery and facilities	Grant aid linked to management
In house	Annual costs of maintenance, transport, staff resources.	
	Disposal costs	Income from hay sales depending on quality.
Hay cutting	Administration of license	Income from licence
	Possible conflict between conservation and commercial hay cutting i.e. time of cut, particularly if farmer is paying for licence.	No cost
Contractor	Annual cost Staff resources securing contractor	No capital costs

Objectives of grazing schemes

The objectives of grazing the sites within the survey were to restore wildlife habitats and produce a varied structure to the vegetation that would benefit wildlife. Similarly GAP (1999) identified the most popular objective as "*a conservation tool*" (Small *et al.*, 1999, p 71) and also drew attention to the fact that within their survey objectives were not limited to the agricultural/conservation management of stock but responses included recreation, education and public appeal. In contrast to this survey they also had respondents whose objectives of grazing included agricultural, commercial issues such as breeding, storing, fattening/finishing and over-wintering. These were generally cited in combination with other objectives.

Income generation as an objective

Sale of stock and subsidy claims were rarely considered as part of the grazing schemes. These potential sources of income would only be relevant to those organisations owning their stock. Income generation is not the primary aim of the organisations. The stock are not being purchased by organisations primarily as a commercial venture. Because of the nature of the organisations the grazing is not necessarily thought of financially in the long-term and income may not be maximised.

Similarly Small *et al.* (1999) identified that income or financial considerations were an objective for only a few sites and then in combination with other objectives.

Only 8% of the sites surveyed were managed by grazing to provide an income and that was in conjunction with the conservation management objectives. Out of these, three organisations owned their own stock and the annual income relates to sale of stock. The other two used a farmer's stock to graze and have an income from the license and grant aid.

Compatibility of objectives for grazing schemes and modern farming

The objectives of the managing organisations for the establishment of a grazing scheme are by definition different from those of a farmer. The latter will generally be to provide a livelihood. Income is a primary objective and therefore any compromise on the quality of the grazing will potentially affect their income. The incompatibility of objectives may explain why many organisations consider purchasing stock. For organisations where stock purchase is unaffordable or not practical, there may be a need to compromise on their conservation objectives to fit in with farmers' requirements

in relation to maximising profit. The level of compromise and its effect on the objectives of the grazing scheme need to be analysed for each individual scheme. Grazing schemes may fail because of inability to find an external supplier of stock who can or is prepared to compromise on their income generating objectives.

Organisations who purchase their own stock to graze sites of conservation interest can select traditional breeds more suited to semi-natural vegetation and their main objective is not necessarily income (Grayson, 1997).

Out of the organisations that own their own stock, only one considered income as an objective. Providing a public attraction was a more common objective. Therefore, the importance of the value of non-market goods (benefits which cannot easily be costed) can be seen in evaluating the cost-effectiveness of grazing these sites.

Financial management of grazing schemes

Financial analysis of grazing schemes is not necessarily undertaken by organisations and issues of profit and loss are not always considered by the site managers, particularly if they do not own the grazing stock. That would be seen as part of the local farmer's role.

Through necessity organisations make do and will find the money to allow grazing to occur. Money comes from various budgets. It was apparent that funding from a variety of sources, but in particular the Countryside Stewardship Scheme, proved vital to the schemes and the constraints identified by organisations to extending the grazing to other sites included lack of resources.

There is a need for more careful financial planning and greater consideration to be given to the objectives for conservation grazing schemes which need to include potential income generation. This is particularly important for organisations which are considering stock purchase. Long-term financial commitment is required in relation to the size of the proposed project.

Careful consideration was given to the objectives and resourcing of the grazing schemes by Hampshire County Council. They initially decided not to create a large unit initially and bought a small number of Highland cattle, simply to achieve the conservation objectives. In this way they minimised the cost to staff resources and overheads. They could expand the Unit to develop a breeding stock and attract income

from subsidies, but recognised that this would increase the need for additional staff resources and would not be part of the original objectives of the scheme.

In contrast, Rotherham Metropolitan Borough Council did not have clear objectives as to the purpose of the Livestock Unit. It was expanded without careful consideration of its main aims, and without additional resources being identified. The breeding programme for the livestock was developed to increase income from subsidies in an attempt to justify its continued existence. However, this also placed additional pressure on staff resources. Pressure on local authority budgets led to the whole unit being sold without any proper consideration as to whether it could be reduced in size and assigned a different direction to reduce the cost implications. The cost and suitability of alternative management was not taken into account by senior officers or members.

There is an increasing need to justify spending in relation to 'Best Value' and many Local Authorities will need to examine the effectiveness of the service they provide both in relation to conservation, cost and public service. This will be particularly important for organisations owning or considering the purchase of stock. Business Planning and projection are likely to become more important in the future and there are opportunities to develop marketing of conservation grazing stock (Small *et al.* , 1999).

Amenity benefits

For the managing organisations it is important for the image of the organisation, to promote the grazing and involve the local community in the management of the site and stock. Use of attractive or rare breeds is likely to generate greater interest than the more common or commercial breeds.

Highland cattle are widely used in conservation grazing schemes (Small *et al.,* 1999). Their appearance, colour, that they are different, and their placid temperament were the main reasons given by visitors for liking the Highland cattle at Keppel's Field in Rotherham. In this particular survey two thirds of the site users felt the Highland cattle had increased their enjoyment and interest in the site. Others also refer to the popularity of Highland cattle (Small *et al.,* 1999). Similarly Longhorn cattle are the main attraction to visitors at Parsonage Down NNR (Elliott and Burton, 1994), and the rare breeds used to graze Burnham Beeches (Read, 1994) and the native ponies on National Trust properties are also popular (Oates, 1994).

Grazing schemes can play a role in promoting the public image of an organisation. They can be a good public relations exercise. Rotherham, because it owns and breeds from its stock, has built up a reputation regionally for the quality of its stock, winning regularly at notable agricultural shows. The Highland cattle are particularly popular with the public and great interest is shown in the work they carry out across the Borough. Similarly the Parsonage Down Longhorns have generated good publicity for English Nature's work (Elliott and Burton, 1994).

Benefits in relation to source and type of stock

The reported benefits to the amenity value of the sites and to public image of the organisation were significantly influenced by the source of livestock used by organisations. More organisations using their own stock to provide the grazing reported major and minor benefits than those using a local farmer's. This may be explained by the fact that those owning their own stock use cattle which are either rare breed White Park cattle, or attract public interest like Highland cattle, Dexters, and Red and Fallow Deer in the case of Richmond Park. However, there was no obvious correlation between the type of stock utilised and the level of benefits to conservation, amenity value or public relations. This was due in part to the fact that so many stock breeds were used so no clear trend was apparent.

The organisations reporting no benefit or negative impact to the amenity use and public relations utilised stock types referred to simply as cattle, longhorn cattle and sheep, all supplied by an external source. It could be suggested that as the animals were "just cattle or sheep" there was little public interest generated. This is unlikely in the case of Longhorns that have proved popular for other organisations (Elliott and Burton, 1994). Similarly if a local farmer is implementing the grazing, the image created will be dependent on the message given. In the case of Exeter City Council, negative impact was recorded for one site because of the public reaction to over-grazing and the associated poaching of the ground. This indicates the importance of monitoring and the flexibility of grazing schemes. If the grazing licence allows grazing within a fixed period of time, it may be difficult to remove grazing livestock in such circumstances. However, if the stock belong to the managing organisation they would have more opportunity to move the stock or reduce numbers.

It would appear therefore that owning stock allows for more flexibility in the choice of breed.This in turn may affect the benefits of grazing, particularly the amenity value of the site and can act as a good public relations exercise for the organisation.

The visitor survey of Keppel's Field in Rotherham provides a useful, if localised, illustration of the success of a particular grazing scheme. Further research opportunities exist in this area to assess the benefits of the different breeds of stock to the amenity value of sites being grazed, and whether there is a correlation between the use of rare breeds/ traditional breeds and increase in amenity value/public interest and support of grazed conservation sites.

The introduction of grazing and its effect on the success of a scheme.

The success and perception of grazing is not necessarily linked to the charm of the animals alone. Issues such as the method by which the grazing is introduced, the level of consultation, access provisions within grazed sites, interpretation and education all play a major part in the success of a scheme (Read, 1994; Read and Williams, 1997; Kampf, 2000).

Almost all the respondents managed sites, which provided public access either within the grazed area of the site, outside it or both. We can therefore see the importance of winning public support for the grazing if the objectives of management are to be met. Interestingly though, only just over half of the respondents carried out any form of public consultation prior to grazing the sites. In some cases this was because grazing had been used on the site for many years and was a continuation of historical grazing management. Many organisations relied on site notices and the media to convey the establishment of a grazing scheme to users of the site. Surprisingly few had held site based or indoor meetings to explain the need for and intended method of introducing grazing to their sites.

Feasibility of grazing schemes in urban countryside.

To ensure that grazing is introduced in the most appropriate way for an organisation or site it would be advisable for an organisation to carry out a feasibility study to ensure all options and factors are taken into consideration in an objective manner. An outline checklist for this is presented in Table 59. The costs and benefits will vary for each scheme and need to be analysed in relation to the managing organisation and the financial and political support for the scheme. The alternative methods need to be considered carefully to assess which methods will achieve which objectives in the most cost-effective manner.

Table 59 Feasibility Study checklist for grazing

Considerations	Options
Objectives of grazing	Most appropriate management, consider alternatives and their impact.
Site	Habitat/s and type/breed of stock Number of stock required Layback grazing land Methods of monitoring success
Source of stock	Local farmer, rare breed grazier, other conservation organisation. Purchase own stock Share stock with other organisation(s) Regional Grazing Scheme.
Level of public use	Level of vandalism, disturbance, seclusion of site (Risk Assessment) Is grazing viable? Appropriate breeds and type of stock – hardiness, temperament, appearance, vulnerability to dogs, abuse generally Consider age and sex of stock. Type of access provision required, zoned grazing or whole site , consultation may be advantageous Interpretation providing information on purpose of the scheme, guidance in relation to animal behaviour and safety.
Public perception	Are there other livestock in the area? Potential amenity attraction, consider in design of scheme. Good Public relation exercise if done properly
Consultation	Important to get support of local people, involvement from the beginning will encourage ownership and a sense of responsibility.
Education	Local schools, groups provide an opportunity to increase understanding and interest in grazing with local children.
Cost analysis	Of different grazing options and alternative forms of management if appropriate. Funding/resources available Staff resources required and their availability Additional funding sources
Purchasing stock	Animal welfare responsibilities- site facilities, supervision of stock, haulage, insurance. Aims – breeding, showing, income generation through subsidies, sales, product labelling. Staff training in relation to stock
Grazing Licence/agreement	To establish responsibilities for stock, boundary maintenance, provision of water, liability insurance, set out grazing requirements.

Conclusion

The cost of grazing varied considerably depending on several factors. In particular the source of stock utilised, which was dictated by availability and suitability of grazing livestock within the local area. Organisations which made the decision to purchase their own livestock generally had higher capital and revenue costs associated with stock welfare and supervision. Organisations utilising an external supply of livestock had reduced costs in relation to the above. Over a longer-term, grazing became more cost-effective for organisations, when compared with the cost of cutting as the widely accepted alternative form of management. This is particularly true for organisations where a local farmer provides the grazing stock.

Estimated cutting costs similarly varied considerably between sites, reflecting site conditions. Many organisations questioned the feasibility of cutting in relation to the type of vegetation. Grazing was seen as the most appropriate management because of the associated ecological benefits. For sites like Sutton Park NNR, cutting would be impractical because of the size and nature of the site. For other organisations, cutting would be possible but the objectives of management would not necessarily be met.

Most organisations did not undertake detailed financial analysis when considering grazing management. The objectives focused on the ecological benefits of grazing over other forms of management. Decisions to purchase livestock were made on this basis and not potential income generation. Although for most organisations lack of further resources limited their ability to extend grazing to additional sites.

The fact that the majority of organisations rely on external sources of livestock, in particular that of local farmers, indicates the importance of promoting better understanding of the objectives of conservation grazing and commercial farming. The future impact of the Foot and Mouth epidemic on conservation grazing schemes remains to be seen. However, if it should impact on the future availability of suitable grazing livestock from local farmers, more organisations may consider the purchase of their own livestock. If this is the case then it will be important that effective appraisals are carried out of both the costs and benefits of grazing in comparison with other methods of management.

There are benefits from grazing in relation to amenity value of the sites grazed. Livestock on reserves can attract interest from visitors and local people. Interest can be generated in both the need for conservation management of the sites, in particular why

grazing is desired, and in the livestock themselves. This is likely if the breeds used are different to the more widely seen commercial farm breeds. For many of the organisations it was felt that visitors liked to see the animals and in some cases the objectives of grazing included the provision of a public attraction.

This benefit to the amenity value is an important consideration for organisations, particularly those managing sites within the urban or urban fringe environments. Grazing is often pronounced as inappropriate in these settings because of concerns over issues like vandalism and animal welfare. In fact these are issues for the countryside as a whole. Many of these issues have been resolved by the organisations through good supervision of the livestock and involvement of local people in the schemes at an early stage.

Similarly the grazing schemes can act as a good public relations exercise for the managing organisation. However, this can be affected by the methods of implementation. Good public relations rely on the public witnessing good husbandry. Signs of over-grazing or poor animal welfare could soon generate negative publicity.

Suggested Further Research

Examine more fully the contribution grazing in urban and urban fringe areas can play towards enhancing the amenity interest of conservation grazing. In particular it would be interesting to study this in relation to the use of traditional British breeds or rare breeds of livestock.

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Appendix 1

List of organisations contacted

	Organisation	Response received
1	Rotherham Metropolitan Borough Council	**Yes**
2	Yorkshire Wildlife Trust, Woodhouse Washlands Management Committee	**Yes**
3	Yorkshire Wildlife Trust, Wharncliffe Crags Management Committee	**Yes**
4	Sheffield City Council	**Yes**
5	Brighton and Hove Council	**Yes**
6	The Royal Parks Agency	**Yes**
7	Corporation of London	No
8	London Borough of Bromley	No
9	Private landowner/English Nature	No
10	Private landowner/English Nature	No
11	Private landowner/ English Nature	No
12	Private landowner/ English Nature	No
13	London Borough of Hillingden	No
14	London Borough of Harrow	**Yes**
15	University of Sussex	**Yes**
16	BBONT	**Yes**
17	Exeter City Council	**Yes**
18	Poole Borough Council	**Yes**
19	Thames Water	No
20	Hertfordshire and Barnet Countryside Management Service	**Yes**
21	White Cliffs Countryside Project	No
22	Hampshire County Council	**Yes**
23	Essex Wildlife Trust	**Yes**
24	Downlands Countryside Management Project	No
25	Reigate and Banstead Borough Council	**Yes**
26	East Dorset District Council	**Yes**
27	Gloucester City Council	No
28	RSPB Dorset	No
29	Three Rivers District Council	**Yes**
30	Birmingham City Council	**Yes**

31	Torbay Council	**Yes**
32	Leeds City Council	No
33	Sefton Coast Project	No
34	Nottingham City Council	**Yes**
35	Nottingham County Council	No
36	Newcastle City Council	**Yes**
37	Bradford City Council	No
38	Barnsley Metropolitan Borough Council	**Yes**
39	Portsmouth City Council	**Yes**
40	Torquay Council	No
41	High Wycombe Council	No
42	Walsall Countryside Service	No
43	Cannock District Council	**Yes**
44	Dudley Metropolitan Borough Council	Yes
45	Heathland Partnership, Staffordshire	Yes (QB)
46	English Nature, Wareham	No
47	Derbyshire Wildlife Trust	**Yes**
48	Staffordshire Wildlife Trust	**Yes**
49	Lincolnshire Wildlife Trust	No
50	Green Meadow Community Farm	**Yes**
51	Staffordshire Moorlands District Council	Yes
52	Staffordshire Borough Council	Yes (QB)
53	Tees Valley Wildlife Trust	**Yes**
54	Glasgow City Council	No
55	Mugdock Country Park	**Yes**
56	Fife District Council	No
57	Lichfield District Council	No
58	English Nature, Durham	No
59	Conwy Borough Council	**Yes**

QB = Questionnaire B

Appendix 2

Organisations responding

Organisation	Site name	Grid Ref
Staffordshire Moorlands District Council	Laddedge Country Park	SJ970550
	Brough Park Fields	SJ985575
	Wetley Moor	SJ930485
Dudley MBC, Leisure Services	Wrens Nest	SO937920
Hampshire County Council	Hacketts Marsh	SU485089
	Netley Common	SU478118
	Sandy Point	SU748983
Newcastle City Council	Hawannah Colliery	
Portsmouth City Council	Portsdown Hill compartment 11	SU620067
	Portsdown Hill compartments 8,9,10	SU656063
Torbay Council	Sharkham Point	SX93543972
	Berry Head	SX94560143
Three Rivers District Council	Croxley Common Moor	TQ082948
BBONT	Wildmoor Heath	SU842626
Birmingham City Council	Sutton Park	SP 410298
	Bracebridge	SP 410298
East Dorset District Council.	Pennington Copse	SU076024
	Cogden Elms	SY9914976
	Leigh Common	SU025001
	Stephens Castle	SU092094
	Hatchards Copse	SU075034
Staffordshire Wildlife Trust	Doxey Marshes	SJ904252
Brighton and Hove Council	Beverdean Down	TQ338067
Mugdock Country Park	Craigend Park	NS546777
	Khyber Park	NS545772
Cannock Chase Council.	Deavall's Farm	SK997103
	Hazelslade LNR	SK026129
London Borough of Harrow	Bentley Priory	TQ155928
Exeter City Council	Mincing Lake Valley Park	SX936947
	Riverside Valley Park	SX940895
	Ludwell Valley Park	SX946911
	Belvidere Meadows	SX929947
	Barley Valley LNR	SX900925

Poole Borough Council	Corfe Hills South	SZ000970
	Bourne Valley	
	Canford Heath	SZ020950
Conwy County Borough Council	Great Orme	SH767835
University of Sussex/ Mid Sussex District Council	Bedelands Farm	TQ318208
	G5 and G5 meadow	TQ300319
Essex Wildlife Trust	Roding Valley Meadows	TQ 430945
Derbyshire Wildlife Trust	Rose End Meadows	SK293567
Reigate and Banstead Borough Council	Stagbury Downs	TQ272582
	Park Downs(Part)	TQ268585
	New Pond Farm	TQ268486
Royal Parks Agency	Richmond Park	176/GS2073
Nottingham City Council	Wollaton Park	SK5339
	Wollaton Park	SK5339
Hertfordshire and Barnett Countryside Management Service	Croxley Common Moor	TQ083948
Barnsley Metropolitan Borough Council	Carlton Marsh	SE379102
Tees Valley Wildlife Trust	Coatham Marsh	NZ585247
Green meadow Community Farm	Ardept	SO 328195
	Home Farm	SO 328195
Yorkshire Wildlife Trust/ Sheffield Wildlife Action Partnership	Woodhouse Washlands	SK432855
Sheffield City Council	Loxley Banks	SK302895
	Rainbow Meadow	SK418841
	Woodhouse Washlands	SK435855
	Westwood Country Park	SK340980
	Graves Park	SK355824
	Sally Clarkes Meadow	SK418844
Rotherham Metropolitan Borough Council.	Firsby Reservoirs	SK495958
	Keppel's Field LNR	SK390948
	Kilnhurst Ings	SK467976
	Meadow gate Lake and meadows	SK458820
	Grange Park	SK390939
Yorkshire Wildlife Trust/Sheffield Wildlife Action Partnership	Wharncliffe Heath	SK 975298

Appendix 3 : Questionnaires

Questionnaire A

Research into conservation grazing of Urban Grasslands, Heaths and Wetlands
Questionnaire for site owners / managers

Name : **Organisation :** **Address:**

1. Please fill in the table identifying where you are using livestock to graze land of conservation interest in an Urban/ Urban fringe area(including aftermath grazing of hay meadows) .

Please include an O.S. map showing the location of the site/s.

	site name	Grid ref.	size (ha)	Site status ie. LNR, SSSI etc	habitat-type	stock used	grazing period (no. of weeks/yr)	season of grazing	stock density (LSU/Ha)
a									
b									
c									
d									
e									

2. Where do your grazing livestock come from ? (If the source is different for each site please specify for each)

	site a	site b	site c	site d	site e
Your own stock					
Local farmer					
Rare breeds centre					
Grazing project					
Other _____					

3. Why did you chose the breed/s you are using ? ----------

4. Please specify whether the sites are managed as pasture or cut as a meadow.
If both management methods are used in different areas on one site please specify the no. of hectare for each

	site a	site b	site c	site d	site e
Pasture					
Meadow(cut once a year, no grazing)					
Meadow(cut once a year with aftermath grazing)					

5. What are your main objectives for grazing the above sites

	site a	site b	site c	site d	site e
Vegetation restoration					
Sustain vegetation structure					
Control scrub development					
to create bare ground by poaching					
Control of invasive species :					
Public attraction					

6. How many years have you been managing the sites by grazing:

	1 yr	2 yr	3 yr	4 yr	5 yr	5-10 yrs
site a						
site b						
site c						
site d						
site e						

7. Has the site has been grazed historically, please describe ?

8. Have other methods of managing the sites been considered ? YES NO

If YES were they: Cutting - for hay ☐ Burning ☐ Abandonment/ non - intervention ☐ Change of use - amenity ☐

amenity ☐ agriculture ☐

rotational ☐ tree planting ☐

9. Is there a management plan for the site/s ? YES ☐ NO ☐

10. Why did you decide on grazing instead of cutting ? (make reference to site a, b, c etc if necessary)

site topography ☐ wet ground cond. ☐ type of vegetation on site ☐ cost ☐
other please specify:

11. How are you monitoring the effectiveness of grazing on the site/s

12. How has grazing benefited the site, please specify the significance:

	major	minor	none	negative
conservation of the habitat				
amenity value				
public relations				

13. Are there other sites which you manage where grazing would be the most appropriate form of management for the habitat, but you are constrained by other factors ?

YES ☐ NO ☐

If YES, what are the constraints you perceive:

level of public access	☐	vandalism	☐	animal welfare	☐	proximity to housing	☐
supervision of stock	☐	availability of stock	☐	suitability of available stock	☐	cost	☐
legal restrictions	☐	common land	☐	conflict with other users	☐	other, please specify	☐

14. Please specify the following capital costs for each grazing project, some are relevant only if you own your own stock *, fill in appropriate sections.

If the same stock graze / machines cut all the sites, express the costs for each site as an average of the total cost

	site a	site b	site c	site d	site e
capital cost of stock, of setting up stock unit to graze these sites. *					
trailer cost *					
staff wages (ie stockpersons) *					
setting up a water supply					
fencing / boundary control					
handling facilities/ buildings to house stock *					
work to make the site safe for the animals					
machinery/ vehicles specific to grazing scheme *					

14a. The alternative cost of cutting the same site/s

	site a	site b	site c	site d	site e
cost of machinery					
staff wages					
cost of vehicles to transport machinery					
other					

15. What are the ongoing annual costs for each site ?

some costs are only relevant if you own your own stock or have to contribute to the costs of the grazier

	site a	site b	site c	site d	site e
stockpersons time and travel costs to site					
vets bills/animal welfare					
haulage of stock					
maintenance of fencing/boundary					
water supply					
notices					
supplementary feed					

15a. What would be the equivalent costs if the sites were cut ?

	site a	site b	site c	site d	site e
Staff time (£/person/hour)					
transport costs					
maintenance of machines					

16. What annual income do you receive ?

	site a	site b	site c	site d	site e
sale of stock					
grazing license					
grant aid					
sale of hay crop					
subsidies					

17. Where the income doesn't cover the total running costs is there a revenue budget to meet the shortfall : YES ☐ NO ☐

If YES : What is the annual budget :

If NO : What other sources of support do you have ? _____

18. Are any of the sites entered into long-term grant schemes ie. Countryside Stewardship, please specify which scheme and payments :

19. Is there public access on the site ? YES ☐ NO ☐

If YES is it : Through the grazed area ☐ Outside of the grazed area ☐

20. How was public consultation carried out before grazing animals were originally introduced ? YES ☐ NO ☐

If YES, was it :

indoor public meeting☐ site meeting ☐ notices☐ consultation leaflet☐ media ☐ none ☐

21. Do you run educational activities using the livestock grazing as a resource YES ☐ NO☐
If yes, please describe :

22. Are there, from your experience, any actual rather than perceived issues effecting the grazing of urban/ urban fringe sites?

23. Are you happy for us to contact you for further information, as a case study? YES ☐ NO ☐

Thankyou for your assistance in completing this questionnaire, please send it to :
Philippa Harvey
Countryside and Forestry Division,
Amenities and Recreation,
Grove Road,
Rotherham.
S60 2ER contact phone no. 01709 822022

Questionnaire B

Research into the use of conservation grazing of Urban/ Urban fringe grasslands, wetlands and heaths -
Questionnaire for site owners / managers who are <u>not</u> currently grazing such sites.

1. **How many sites of conservation interest do you manage where grazing could be an appropriate method of management. Please fill in table and enclose an O.S. map showing site location.**

	Site name	grid ref.	Size	site status	habitat-type/s	method of management
a						
b						
c						
d						
e						

2. **What are your objectives for managing the above sites, please list:**

3. **Have you considered grazing as a management method on any of the sites?** Yes ☐ No ☐

4. **If Yes, did you introduce grazing initially** Yes ☐ No ☐

5. **What were the reasons you did not implement grazing or have discontinued grazing ?**

Legal restrictions ☐ proximity to housing ☐ level of public acces☐ availability of stock ☐ supervision of stock ☐ vandalism ☐

animal welfare ☐ suitability of available stock ☐ cost ☐ other users/conflict ☐

other please specify:

6. **Has the site been grazed historically ?** Yes ☐ No ☐

If yes, please explain how long ago and by whom:

7. How do you now manage the site/s ?

8. How has the current management benefited the site:

	major	minor	none	negative
Conservation of the site				
Amenity value				
Public relation				

9. How are you measuring the effectiveness of the current management on the sites ?

10. What was the capital cost of setting up the management of the site/s in this way ie machinery, transporting machinery, staff wages, storage facilities etc.

11. What are the annual costs of managing each site, please specify the item and the amount.

12. What annual income do you receive for (or from) each site

	site a	site b	site c	site d	site e
license/lease fee					
grant aid					
sale of hay crop					

Thank you for your assistance in completing this questionnaire, please send it to :

Philippa Harvey
Countryside and Forestry Division
Recreation Offices
Grove Road
Rotherham
S60 2ER

Contact Phone No: 01709 822022 e-mail : philippa.harvey@rotherham.gov.uk

Visitor Questionnaire

Keppel's Field Visitor Survey

1. What do you like about living next to Keppel's Field?

2. Aswell as living next to the field, do you visit the site? Yes ☐ 1 No ☐ 2

3. How do you generally visit the site

By car	☐ 1
By bus	☐ 2
Walk	☐ 3
Cycle	☐ 4
By horse	☐ 5
Other	☐ 6

4 Where have you travelled from ; Postcode:

5 How often do you visit?

Several times a day	☐ 1
Daily	☐ 2
Weekly	☐ 3
Fortnightly	☐ 4
Monthly	☐ 5
Less than monthly	☐ 6
Not at all	☐ 7
First time	☐ 8

6 How many visits have you made in the last 7 days? ----------

7 On average how long do you spend on each visit (door to door)? ----------

8. What is the purpose of your visit?

Exercise	☐ 1
To walk the dog	☐ 2
Relaxation	☐ 3
To visit the cattle	☐ 4
To look at the natural history	☐ 5
Other	☐ 6

9. What encourages you to visit here instead of other places?

Near to where you live	☐ 1
Landscape/views	☐ 2
The cattle	☐ 3
Wildlife/ natural history	☐ 4
The people you meet	☐ 5
Easy access	☐ 6
Feel safe	☐ 7
Other	☐ 8

10. Where do you go on the site? ----------

11. Who manages Keppel's Field?----------

12. Why is the site managed in the current way? ----------

---

13 How have you learnt that ?

Public meeting	☐ 1
Site notice/poster	☐ 2
newspaper article	☐ 3
Site meeting	☐ 4
Management plan	☐ 5
Word of mouth	☐ 6
Phone conversation	☐ 7
Other ----------	☐ 8

14 Keppel's Field LNR is currently managed by a combination of hay cutting and low level grazing. The aim of managing the Field is to conserve the flower rich grassland habitat and its wildlife.

Do you think this management should continue? Yes ☐1 No ☐2

15 If No, how would you manage the site differently? ----------
---

16 How has the presence of the cattle affected the level of your enjoyment/interest ?

Increased it	☐ 1
Decreased it	☐ 2
Made no difference	☐ 3

17 Do you visit the site more often now the cattle are grazing here?

Yes ☐ 1
No ☐ 2

18 If yes is it

Twice as often	☐ 1
Three times as often	☐ 2
More	☐ 3

19 What is it about these cattle you like?

	Appearance	☐ 1
	Temperament	☐ 2
Colour		☐ 3
	They belong	☐ 4
	Interesting to watch	☐ 5

20 What type of cattle are grazing? ----------

21 Has the presence of the cattle influenced the way you use the site?
Yes ☐ 1 No ☐ 2

If yes, how? ----------

Thankyou

Appendix 4

Case Study Interview Questions

Exeter City Council
Chris Moulton

Grazing versus other management

1. You state that hay cutting was considered for Belvidere Meadows and tree planting and amenity cutting for Mincing Lake Valley Park – does that relate to the areas that are now grazed?

2. (If yes) why did you select grazing?

3. How did the costs of managing the land affect the decision?

4. Was the income from a grazing license significant?

5. How in reality would you manage these sites without grazing?

6. You state that all the sites have been grazed in the past - how long ago and how long has the Countryside Service been grazing them.
7. Why did you re - introduce it.

8. How were the sites managed in the intervening period.

9. Do the sites belong to the council – how long have they owned them.

10. Did they purchase/acquire them for a reason ?

Stock Breed/Source

11. What type of cattle ?

12. How did you find the farmer that provides the stock?

13. Have you always used the same farmer?

14. How does the arrangement work?(formal, informal)

15. If you had the choice of any stock what would you select and why?

Animal welfare/ responsibilities

16. Who is responsible for animal welfare?

17. Have you had any difficulties in relation to animal welfare?

18. How often does he/she check the stock?

19. Is that formalised in the licence agreement?

20. Who maintains the boundary and water supply?

21. Would there be any way the existing arrangement could be improved?

22. What in your opinion, are the benefits of using someone else's stock?

23. Would/have the Service consider purchasing its own stock if it became necessary?

Support

24. What support for grazing has the Countryside Service received ?– public, internal?

25. You mention quite a few issues effecting grazing of sites like this –(vandalism = straying cattle, water, loss of income from calf aborting linked to dogs, and people avoiding grazed areas)
How have you tried to address the issues?

26. How much do these points effect the continued grazing of the sites?

Similarly in the question relating to constraints which prevent you grazing other sites you mention vandalism, conflict with other users, level of access, animal welfare.
27. How do you decide on a sites suitability?(risk assessment)

28. Are the constraints worse on these other sites?

Grant Aid

Riverside Valley Park is entered into CSS.
29. Are the other sites suitable for this or a similar scheme?

30. Why do the Service not apply for this funding?

Monitoring

31. Has grazing management achieved the objectives identified?

32. How do you assess that?

33. What type of botanical surveys are carried out?

34. How did you decide on the method used?

35. You state that the benefits to the conservation of the habitat have been major – how?

36. How have the amenity value and public relations benefit been assessed?

37. Why has their been a negative amenity benefit for Belvedere Meadows?

Finance

38. For the alternative cutting costs you state they are very approximate, how did you estimate the cost given?

39. How do you determine the fee for grazing?

40. Is it reviewed regularly?

41. Is the farmer happy to pay the amount requested?

Access

Access is through the grazed area on all the sites.

42. What consideration did you make in relation to access and grazing?

43. Is there an option available allowing people to walk in cattle free areas?

44. Have you considered zoning or rotating the grazed areas?

45. How are local people involved in the management of the sites?

46. Has the attitude of local people/ users changed - how?

General

47. Are you in contact with other organisations implementing grazing?

48. What in your opinion are the main issues surrounding the management of sites like yours?

49. Are you optimistic about the future – Is grazing secure in the long term, what factors effect this?

Hampshire County Council
Phil Halliwell

Grazing versus other management

1. You state cutting for hay was considered- which site/s?

2. Why was grazing selected? (State on Q that it was wet ground, type of vegetation on site and cost)

3. Did you investigate the costs involved in managing it differently?

4. How had you managed the sites before grazing?

5. How long has organisation owned/been responsible for the sites?

6. How would you manage the sites without grazing, in reality?

Stock purchasing

7. Why did you decide to purchase stock?

8. Where did you get the stock from?

9. Have you used stock to graze the sites before?

10. Where were they from?

11. What advantages are there in owning your own stock?

12. Are there any disadvantages?

13. What support have you had for grazing (public, organisation etc)

14. How did the council take forward purchasing stock?

15. Did you receive funding to support purchase of stock?

Animal welfare

16. Who is responsible for the stock ? (Committee report says there is a farm foreman, based at Staunton Country Park).

17. What qualification and/or training?

18. Any difficulties in relation to animal welfare?

19. Where are they kept when not grazing the sites?

20. Do you hope to graze on a wider scale to include other sites which the organisation manages?

21. You stated there are sites that would benefit from grazing which you consider unsuitable for other reasons.
    How do you assess sites suitability for grazing?(risk assessment)

Selection of breeds

22. Did you find out about lots of breeds before selecting Highland Cattle? Why did you pick them?

23. Do you intend to breed from the stock or sell them?

24. Is their a business plan relating to the stock?

25. Hacketts Marsh is grazed by your own stock, a farmers stock and New Forest Ponies.
    Why that combination? Did you choose it?

    Is the historical grazing linked to those stock?

26. Netley Common, a Heathland is grazed by Highlands and ponies, Why that combination? Did you choose it?

    What did the Chamberlayne Estate graze it with previously?

Monitoring

Has grazing management achieved the objectives identified?

How do you assess that?

How did you decide on the type of surveys?

You state the benefits to conservation as major- how?

Have their been no benefits to the amenity value of the site?

Finance
Ask about the Committee Report and whether that is same scheme? Annual revenue costs estimated to be £8000-£10,000.

The costs given on the form relate to the sites- are there in fact other annual costs relating to the running of the farm?

The capital costs given were 6 cattle at £150 each
The rest related to site management – fencing, water, handling facilities
Annual cost include staff costs- how does that work?

Vets bills have they been more or less than expected? Why?

What subsidies are you claiming for the cattle?

The alternative cutting costs – you mention purchase of machine and contractor rate of £40 a day- how did you reach these figures?
(Would you need to purchase the machinery if you were paying a contractor?)

You have a grazing licence for Hacketts Marsh, is that for the cattle or ponies?

Is this income one of the factors influencing the use of the farmer?

Why was Hacketts refused CSS?

Have you now entered Netley Common for CSS.

Access

What considerations to public access and other users did you make in relation to the grazing of the sites?(no access in grazed area)

Did the public used to have access in the grazed area?

What was the reaction from the users of the site to the grazing/animals?

How have you involved them- you mention volunteer warden schemes?

How has the attitude of local people/visitors changed since you introduced grazing?

General

27. Are you in contact with other organisations implementing grazing? How are they doing it?

28. Are you involved in the Regional Grazing Project set up in Hampshire?
(Which is based at Queen Elizabeth Country Park?)

29. What in your opinion are the main issues surrounding the management of sites like yours?

48. Are you optimistic about the future - Is the future of the grazing secure in the long term, what factors may affect that?

Birmingham City Council
Stefan Bodnar

History

Grazing of Bracebridge is recent, was it grazed before as part of the Park?

How was it managed by you before new grazing scheme?

Sites belong to English Nature or City of Birmingham? – how long have they owned/managed them.

Stock Breed/Source

1. How did you find the farmer/s that provides the beef cattle for Sutton Park?
2. Have you always used the same farmer/s?
3. How does the arrangement work?(formal, informal)
4. In the article in B.Wildlife it is recommended that the grazing level is increased to around 400 cattle to sustain the areas biodiversity – have you achieved this?
5. What is stopping you?
6. When did you decide to use Exmoors on Bracebridge?
7. How many are there?
8. Do you intend to increase the use of ponies within the whole Park?
9. If you had the choice of any stock what would you select and why?
10. In the British Wildlife article in 1998 the future use of hardier breeds is discussed as suitable to control the scrub and Purple Moor –grass are you intending to pursue the suggestion?
11. Are there farmers etc locally who own rare/hardier breeds?
12. Would English Nature/ Council considered purchasing more of its own stock in order to improve the effect of grazing across the whole site?
13. What are the constraints preventing this?

Animal welfare/ responsibilities

14. Who is responsible for animal welfare for ponies -
15. for cattle -
16. Did the staff already have experience of livestock?

17. Has any training been necessary?

18. Have you had any difficulties in relation to animal welfare?

19. How often does the farmer check their stock?

20. Is that formalised in the licence agreement?

21. How often do the staff check the ponies?

22. Who maintains the boundary and water supply?

23. Would there be any way the existing arrangement could be improved?

24. What in your opinion, are the benefits of using someone else's stock?

25. What are the disadvantages?

Support

26. What support for the revival of grazing at Sutton Park has their been ?– public, local authority, internal?

27. You mention that the dung was a health and Safety issue- how did this arise ie complaint, incident etc
28. How have you tried to address the issues?

29. How much does this effect the continued grazing of the sites?

30. Similarly in the question relating to constraints which prevent you grazing other sites you mention conflict with other users, level of access, animal welfare, suitability, availability and supervision of stock.
31. How do you decide on a sites suitability?(risk assessment)

32. Are the constraints worse on these other sites than at Sutton Park?

Monitoring

33. Is grazing management achieved the objectives identified?

34. How do you assess that?

35. What type of botanical surveys are carried out?

36. How did you decide on the method used?

37. You state that the benefits to the conservation of the habitat have been major – how

38. How did you assess the amenity value and public relations benefit?

Grazing versus other management

39. How did the costs of managing the land affect the decision?

40. Was the income from a grazing license significant?

41. How in reality would you manage these sites without grazing?

42. Is it possible to manage the sites by a different method and still achieve the required results?

Finance

43. You state that 25% of set up costs for pony grazing has been met by NNR Section 35 capital grant scheme, did English Nature/ Council fund the other75%.

44. You estimated annual costs to be £1000-2000 max on original questionnaire- has that proved to be the case for the first year?

45. The costs of supporting the grazing at the site are met by EN/ Council?

46. Does funding restrict the recommended expansion of the grazing level across the whole Park?

47. For the alternative cutting costs you state they are very approximate, how did you estimate the cost given?

48. How do you determine the fee for grazing?

49. Is it reviewed regularly?

50. Is the farmer happy to pay the amount requested?

Access

Access is through the grazed area on all the sites.

51. What consideration did you make in relation to access and grazing?

52. Was/Is it an issue with local people/users?

53. Is there an option available allowing people to walk in cattle free areas?

54. Have you considered zoning or rotating the grazed areas?

55. How are local people involved in the management of the sites?

General

56. Are you in contact with other organisations implementing grazing?

57. What in your opinion are the main issues surrounding the management of sites like yours?

58. Are you optimistic about the future – Is grazing secure in the long term, what factors effect this?

Table 20 Reasons given for stating cutting costs were not applicable to their site.