CONSERVATION AND THE FARM BUSINESS - FARM 2

CASE STUDY 2

CRAVEN LIMESTONE
WILDLIFE ENHANCEMENT SCHEME - TIER 1

INTRODUCTION

The Craven area includes the largest expanse of upland limestone in Britain, most of which is notified as SSSI. The main objectives of the Scheme are to increase the flowering and abundance of many special limestone plants and enhance other wildlife through positive management.

Management guidelines

- No artificial fertilisers, farmyard manure, slurry or lime can be used;
- Cattle should be grazed in preference to sheep in the summer;
- Stock feeding in the SSSI area must be kept to a minimum;
- The following stocking rates apply:

An 8 week period between 1 May - 31 August	1 ewe/ha (0.4 ewes/ac)
All other times	2 ewes/ha (0.8 ewes/ac)

IMPLICATIONS FOR FARM 2

Farm 2 has a suckler herd of 51 breeding cows, producing 48 calves per year and a sheep flock of 445 ewes with a lambing percentage of 143 lambs sold. There are 34 ha (84 ac) of rough grazing, 28 ha (69 ac) of common land and 96 ha (237 ac) of in-bye land. The profit for the 1995/96 year was £9,775.

Scenario 1 **- 50 ha of the rough grazing land falls within the SSSI -** The current grazing pattern means that the farm is overstocked on this area from June to September by up to 89 ewes with lambs during the 8 week restricted stocking period (assuming that the stocking rate on other areas remains the same) The timing of the 8 week restricted stocking period could be critical to the farm. In this case it is assumed to be July and August. The farm is also overstocked during the winter by about 49 ewes. To enable the farm to meet these criteria there are a number of options the farmer may consider, e.g.:

Option 1a - Rent additional land in summer and away-winter ewes
Option 1b - Reduce stock numbers by selling off-farm

It is assumed that everything else on the farm remains the same i.e. rent, machinery costs and labour costs etc., and that the farm is able to carry out all the suggested adjustments.

Original profit for 1995/96 = £9,775

Option 1a - Rent additional land in summer and away-winter ewes There is insufficient rough grazing land to accommodate all the cattle, therefore if cattle were to be grazed in preference to sheep the herd would have to be split. This would generally result in management problems and may lead to an increase in the workload. Therefore sheep will continue to graze the rough grazing land. Land would need to be rented to accommodate the equivalent of 89 ewes with lambs. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 49 ewes.	Rent* 22 ac @ £120 /ac = £2,640 Agistment 49 ewes @ £8/head = £392 WES payment = £1,105 **Revised profit = £7,848**
Option 1b - Reduce stock numbers by selling off-farm To meet the stocking rate restrictions the flock must be reduced by about 89 ewes. This will also eliminate the need to away-winter animals. Stock numbers on the in-bye land do not change. **Capital released - ewe quota 89 units @ £35/unit = £3,115; and ewes sold 89 ewes @ £40/ewe = £3,560.** ***Total £6,675***	Income lost from sheep - 89 ewes @ £59 /head = £5,251 Saving in hay purchase 8 t @ £75/t = £600 WES payment = £1,105 **Revised profit = £6,229**

DISCUSSION

Option a relies on the availability and cost of land to rent for summer grazing. This is normally extremely scarce and expensive within the area and would therefore not be a valid option to many farms. The management of the farm would also be complicated by having animals and land some distance from the main holding. Although the effect on profit is not as great as reducing stock numbers it does expose the business to risk.

Reducing stock numbers results in a large reduction in farm profit of £3,546 but releases £6,675 of capital. Despite the fact that the capital released could be put to other uses and the requirement for winter fodder is reduced along with the workload, it is unlikely that the prospect of a reduction in profit of this level would be attractive to the farmer, especially considering that the level of profit in the first place is relatively low.

It would therefore seem that the most likely option is to rent additional land and away-winter ewes, assuming that this is practically possible.

* Area required and rental value is based on the equivalent of lowland permanent pasture stocked at 10 ewes/ha due to the varying quality and cost of any summer grazing that may be available within the Dales.

CONSERVATION AND THE FARM BUSINESS - FARM 2

CASE STUDY 3

YORKSHIRE DALES MEADOWS AND PASTURES WILDLIFE ENHANCEMENT SCHEME

INTRODUCTION

Many of the finest meadows in the country are found in the Dales and along with some in-bye pastures are often rich in a variety of plant species. The main objectives of the scheme are to increase the flowering and abundance of many special meadow and pasture plants and maintain the plant diversity as well as provide good breeding conditions for birds through reduced productivity.

Management guidelines - Meadow Land

- No artificial fertilisers, slurry or lime can be used, limited farmyard manure is allowed;
- Stock feeding in the SSSI area must be kept to a minimum;
- Only hay must be made;
- The meadow must be shut up for at least 8 weeks from mid-May and cut hay from mid-July.

Management guidelines - Pasture Land

- No artificial fertilisers, farmyard manure, slurry or lime can be used;
- Avoid poaching;
- The pasture must be kept stock free for an 8 week period between May and August.

IMPLICATIONS FOR FARM 2

Farm 2 has a suckler herd of 51 breeding cows, producing 48 calves per year and a sheep flock of 445 ewes with a lambing percentage of 143 lambs sold. There are 34 ha (84 ac) of rough grazing, 28 ha (69 ac) of common land and 96 ha (237 ac) of in-bye land. The profit for the 1995/96 year was £9,775.

The current farm system would tend to exclude an SSSI involving meadow land as only silage is made on the farm and there would be no traditional hay meadows. The land used for silage making is intensively managed on a two cut system with relatively high levels of fertiliser. It is therefore unlikely that species of interest would be present at the outset.

The grazing land is also intensively managed with relatively high fertiliser use and stocking rates. There may, however, be some benefit to bird populations of a change in cutting dates and grazing practices. Restrictions of this nature are likely to have a large impact on the farm due to the lack of flexibility available to move animals onto other areas and the present high reliance on bought-in forage.

Pasture Land

With no fertiliser being applied the productivity of the grass is reduced. In this case the current level of fertiliser use is fairly high at 130 kg/ha N. Therefore a yield reduction of about 60% would be expected. This, along with the 8 week exclusion period, means that stock numbers will have to be reduced, either permanently or removed and accommodated on existing areas by increasing stocking rates or off the farm.

Scenario 1 - **2 ha of the in-bye land falls within the SSSI** - The reduction in productivity results in a reduction in stocking capacity of the area affected by about 25 ewes with lambs. During the 8 week exclusion period a further 6 ewes with lambs would be excluded. Because the area affected is relatively small these ewes could be accommodated through an increase in stocking rate on the rest of the in-bye land.

Original profit for 1995/96 = £9,775

Option 1a - Increase stocking rate on other in-bye grazing areas An increase to 14 ewes/ha would be required throughout the season with a further increase to 15 ewes/ha during the 8 week exclusion period. To achieve this level of stocking fertiliser would have to be increased to 150 kg/ha N on other areas.	Increased fertiliser cost on 69 ha = £952 Saving in fertiliser and spray on 2 ha = £86 WES payment 2 ha @ £150/ha = £300 **Revised profit = £9,209**

Scenario 2 - **10 ha of the in-bye land falls within the SSSI** - The reduction in productivity results in a reduction in stocking capacity of the area affected by about 100 ewes with lambs. During the 8 week exclusion period a further 30 ewes with lambs would be excluded. The farm would have to intensify greatly to accommodate this number therefore ewe numbers would need to be reduced to cope with this decrease in productivity.

Original profit for 1995/96 = £9,775

Option 2a - Reduce stock numbers and increase stocking rate on other in-bye grazing areas To cope with the reduced stock carrying capacity on the SSSI area the flock needs to be reduced by about 100 ewes. In addition there would also need to be an increase in fertiliser use and stocking rate on other in-bye grazing areas to enable the stock removed from the SSSI area during the 8 week exclusion period to be grazed on the farm. **Capital released - Ewe quota 100 units @ £35/unit = £3,500; ewes sold 100 ewes @ £40/ewe = £4,000.** ***Total £7,500***	Increased fertiliser cost on 61 ha = £842 Income lost from sheep 100 ewes @ £59 /head = £5,900 Saving in fertiliser and spray on 10 ha = £430 Saving in hay purchase 9t @ £75/t = 675 WES payment 10 ha @ £150/ha = £1,500 **Revised profit = £5,638**

DISCUSSION

Where only 2 ha are affected the farm is able to cope with relatively small increases in fertiliser use. However, where 10 ha are affected the lack of flexibility the farm has results in a large reduction in profitability through the need to reduce stock numbers. The ability of the farm to

cope in such circumstances depends greatly on land quality and it is unlikely that the large increases in forage production that would be required to maintain stock numbers could be achieved on this type of farm due to soil type, climate etc. There will also be little scope to increase the grazing pressure on other parts of the farm as they are already fairly heavily stocked. If the farm is to cope with such a decrease in forage production it therefore appears that stock numbers will have to be reduced resulting in a relatively large decrease in profitability. This would have the knock-on effects of releasing capital that could be put to other uses and easing the workload.

Farming and Wildlife Advisory Group in North Yorkshire

CONSERVATION & THE FARM BUSINESS (KIU85)

PRODUCTION OF HANDOUTS - IDENTIFICATION & COSTING OF NATURE CONSERVATION MANAGEMENT PRACTICES

Background

This short report and attached information forms part of the above contract involving both FWAG in North Yorkshire and the University of Newcastle. FWAG has assisted Newcastle University in producing financial information and has produced the attached draft handouts detailing specific nature conservation management practices.

Commentary

Drop Traps for Rabbit Control

Control of rabbit damage is a useful area of common ground of interest to both farmers and conservationists. Bearing in mind that 7 rabbits eat around the same amount of grass as one sheep, the financial implications are severe on farm businesses, and the benefits of rabbit control substantial.

The handout details the background, benefits and methods of rabbit control using drop traps. A plan is enclosed showing construction details. This was originally produced by ADAS Wildlife and Storage Biology Department c. 10 years ago, and permission may be required to reproduce it.

The organisation or sponsorship of an event centred on rabbit control by English Nature in conjunction with FWAG would be likely to attract good numbers of Dales farmers and act as a vehicle for delivering other conservation messages as well as helping to promote a positive image to the farming community.

Rabbit control is an area where there are potentially many environmental, agricultural and socio-economic benefits. A rabbit control initiative forms part of the current Yorwoods proposals for Objective 5b funding and this has been the focus of FWAG events in the past.

Post & Wire Fencing

Fencing for nature conservation purposes is also, in many cases, likely to benefit the farm business by providing easier stock management, facilitating rabbit control, and allowing for "clean grazing systems". The handout outlines the main types of post and wire fencing likely to be used (including high tensile) and range of costs involved. This is based on a range of technical notes from various organisations, and it is recommended that the views of fencing contractor(s) are also sought. Illustrations of different fencing types could usefully be added to this handout.

Moorland Grip Blocking

The handout on moorland grip blocking outlines the history, benefits and methods as well as costs involved. A "birds eye view" type illustration could usefully be added to this handout. There is resistance to this practice from some moorland owners who, understandably, may have spent considerable time effort and money in the past draining wet moorland. There is a perception that some moorland gripping has been beneficial, and more quantitative information on the implications on grip blocking would be advantageous; for example on invertebrate numbers, grouse chick survival, etc. It would be interesting to know if a hydrological study of a moorland has been undertaken with and without gripping and whether the results of this could be used to add more hard facts. It is understood that the Environment Agency are currently considering a study of the upper Wharfe catchment which may be usefully linked to this. A future event focusing on moorland management, and including grip blocking, would be very worthwhile.

Conclusions

The handouts produced were copied and made available at the Darnbrook event on 25th June. Subject to final amendments the information could be usefully employed to support other similar events in the future as well as circulated by other means to organisations and individuals involved with work in these areas. Future events on rabbit control and moorland management are strongly recommended.

DEMONSTRATION & TRAINING IN CONSERVATION LAND MANAGEMENT

A New English Nature Service in the Yorkshire Dales

Identification & Costing of Nature Conservation Management Practices

Post and Wire Fencing

Objectives of Fencing for Nature Conservation

Fencing is used widely to achieve nature conservation objectives including:

- Management of stock on sensitive grassland sites, particularly to allow for reducing stock numbers at certain times of year.
- Exclusion of reduction of stock numbers on moorland sites to encourage heather regeneration.
- Exclusion of stock, rabbits and deer from existing or newly planted woodlands, and to protect restored or newly planted hedges.
- To facilitate rabbit control generally.

Fencing may be permanent post and wire (or post and rail), permanent electric and temporary electric. This note is confined to post and wire fencing which is most widely used to achieve conservation objectives in the Dales.

Specification

General - All wire fencing should be erected in straight lines between strainers, which should be placed at the ends of the fence and at changes in direction. Wire and netting should be well strained and taught. Wire should be loosely stapled to intermediate posts to keep it in place and not hammered right in so as to prevent damage to the galvanising. All posts should be peeled and tanalised or treated with an approved preservative.

Sheep Fencing - Sheep netting (usually 8/80/15) should be galvanised and the fence should be no less than 1.05m high. Strainers should be minimum 125mm top diameter round timber or 100mm x 100mmm sawn and 2.15m long and set no more than 100m apart with traditional fencing and no more than 200m apart with high tensile. Struts should be 80mm top diameter, 1.9m long and notched into the strainer at an angle of no greater than 45°. Intermediate posts should be 80mm top diameter round timber or 75mm x 75mm sawn, 1.7m long (1.8m long where 1.15m wide net is used) and set at centres not exceeding 3m (closer on difficult sites).

Post and Wire Fencing - Wire should be galvanised 4mm mild steel or 3.15mm high tensile steel and fence should be not less than 1.05m high. Strainers should be 125mm top diameter round timber or 125mm x 125mm sawn and 2.15m long. Other details as per sheep fencing.

Rabbit Netting - Galvanised wire netting not less than 1.05m wide should be used with a mesh no larger than 31mm. The top edge of the netting should be not less than 0.75m above ground level. The netting should be fastened to the fencing or galvanised line wires using galvanised netting rings, with the bottom edge of the netting buried in the ground 150mm and turned outwards 150mm and anchored, or alternatively turned outwards and pegged.

Fencing Types and Costs

Estimated costs given below are for guidance only, and on many sites in the Dales the inaccessibility, remoteness, steepness and difficult ground conditions may substantially increase costs. All figures are given for guidance only, and are exclusive of VAT:

Materials:

Description	Estimated £/m
Traditional sheep net fence One plain and one barbed wire. Posts @ 3m centres.	£1.30
High tensile sheep net fence As above with posts @ 8m centres.	£0.99
Traditional post and wire stock fence. 5-7 lines of plain/barbed wire. Posts @ 3m centres.	£1.19-£1.45
High tensile post and wire stock fence with droppers. 5-7 lines of plain/barbed wire. Posts @ 8m centres. Droppers @ 2m centres.	£1.09
Rabbit net fence. Posts @ 4m centres. Rabbit net attached to line wires.	£1.08
Rabbit net added to stock or sheep fence.	£0.60

Labour

Description	Estimated £/m
Erecting stock fence - all types - Contractor	£0.98 - £1.50
Erecting stock fence - all types - Farm Labour - based on 70m/ 8 hour day @ £4/hour	£0.46
British Trust for Conservation Volunteers - based on 80m - 120m per day per volunteer group, £95/group/day	£0.79 - £1.19

Grant aid

Grant aid for fencing may be available under the following grant schemes (all subject to approval):

English Nature Wildlife Enhancement Scheme (SSSI land only)	*Standard costs for conservation management and woodland regeneration - sheep fence £3.50/m, rabbit fence £4/m, sheep and rabbit net fence £4.50/m, rabbit net attached to existing stock fence £1.50/m. Agreed proportion of costs in other situations for grazing management.*
Forestry Authority Woodland Grant Scheme.	*50% of costs under Woodland Improvement Grant (WIG) with possible 100% of costs under special Challenge Funding. for existing undermanaged woodland.*
MAFF Countryside Stewardship Scheme	*£0.60/m for rabbit and sheep netting, £0.80/m for line wire fencing, £1.20/m for sheep fencing.*
MAFF Environmentally Sensitive Areas Scheme	*50% - 80% of costs as part of Conservation Plan.*
Yorkshire Dales National Park	*90% of costs under Woodland Management Grant.*
Yorkshire Dales Millennium Trust	*90% - 100% of costs as part of a woodland scheme or conservation project.*

Contacts

Suppliers of fencing materials, contractors, assistance with grants	*Contact lists and advice available from the Farming and Wildlife Advisory Group, South Parade, Northallerton. DL7 8SL. Contact Phil Lyth on 01609 783632.*

References:- SAC Farm Management Handbook 1996/97/ Countryside Stewardship Scheme Guidance Notes/ BTCV Project Estimation Guidelines/ MAFF Standard Costs Booklet SC1.

Produced for English Nature by the Farming and Wildlife Advisory Group in North Yorkshire.

DEMONSTRATION & TRAINING IN CONSERVATION LAND MANAGEMENT

A New English Nature Service in the Yorkshire Dales

Identification & Costing of Nature Conservation Management Practices

Drop Traps for Rabbit Control

Introduction

Rabbits are not native to Britain, they were introduced by the Norman's in the 12th century, when they were farmed in "warrens" for meat and fur. Rabbit numbers have been steadily increasing across the UK since myxomatosis wiped out 99% of the population in 1953. Rabbits breed mainly from January to August, and one doe can produce 20 - 30 young in a year. The females born early in the year can breed late in the same season. Some areas are now back to pre-disease levels.

Drop traps can be a very effective way of managing the rabbit numbers on a farm if used in conjunction with rabbit fencing. One Scottish farmer has cleared 76,000 rabbits from his land using drop traps, including 62 rabbits in one box on one night! One of the advantages of drop traps is that they catch young rabbits before they can breed Other control methods include gassing, shooting, ferreting and long netting, and these should be used in conjunction with drop traps, particularly to control large numbers initially.

Objectives of Rabbit Control

Rabbits feed primarily on grassland and cereals, and can cause severe damage to these crops. It has been estimated that seven rabbits consume the same amount of grass as one sheep, and one rabbit therefore costs around £7 in lost production. Rabbit damage to trees and woodlands can be severe, preventing natural regeneration, stripping bark and damaging leading shoots. Rabbits can cause overgrazing on sensitive grassland sites, damaging the ecological interest by removing flower spikes of tall plants such as orchids and thus preventing seed production, and causing the ingress of thistles and other problems weeds.

Eradication of rabbits is impractical, particularly on Dales farms due to the nature of the ground. It may also be undesirable in some areas, where rabbits contribute to maintaining otherwise ungrazed swards and therefore species diversity, and provide a food source for birds of prey including buzzards. Instead, the aim should be to reduce numbers to acceptable levels. Drop traps are one of the most effective ways of achieving this, but ideally control should be co-ordinated over a large area of land, often involving several farmers or landowners.

Specification for Drop Traps

Construction - Each trap is a box of around 0.9m x 0.6m x 0.6m which is dug into the ground under a rabbit run. Rabbits are caught as they run across a balanced tilt lid which acts like a trap door - the lid opens and the rabbit falls into the box. The lid then swings back up, preventing escape. Care should be taken that the trap does not fill with water, and that the rabbits cannot burrow their way out!

Location - Rabbit fencing should be erected around infested areas, and the rabbits eager to return to their feeding grounds will eventually find a way through and establish runs. Site the

drop traps under these runs with the lid flush with the ground. Allow rabbits to get used to the run during the first week or so by fastening the lid shut.

Management - Set traps one night a week for best results, and if you have several traps set them on rotation, a few each evening. Always check the traps each morning. Manage the fence to prevent new runs establishing. Concentrate control between November and March to reduce the adult breeding population.

Costings

The figures below are given for guidance only, and are exclusive of VAT:

Cost of made up box	*£30 - £50*
Installation of box - 2 hours	*£8*
Rabbit fencing (materials and labour)	*£1.80 - £2.20/m*
Rabbit and stock fencing (materials and labour)	*£3 - £4/m*
Management - 1 hour per week	*£4 (The value of the rabbits for meat should often more than cover this cost)*

Grant aid

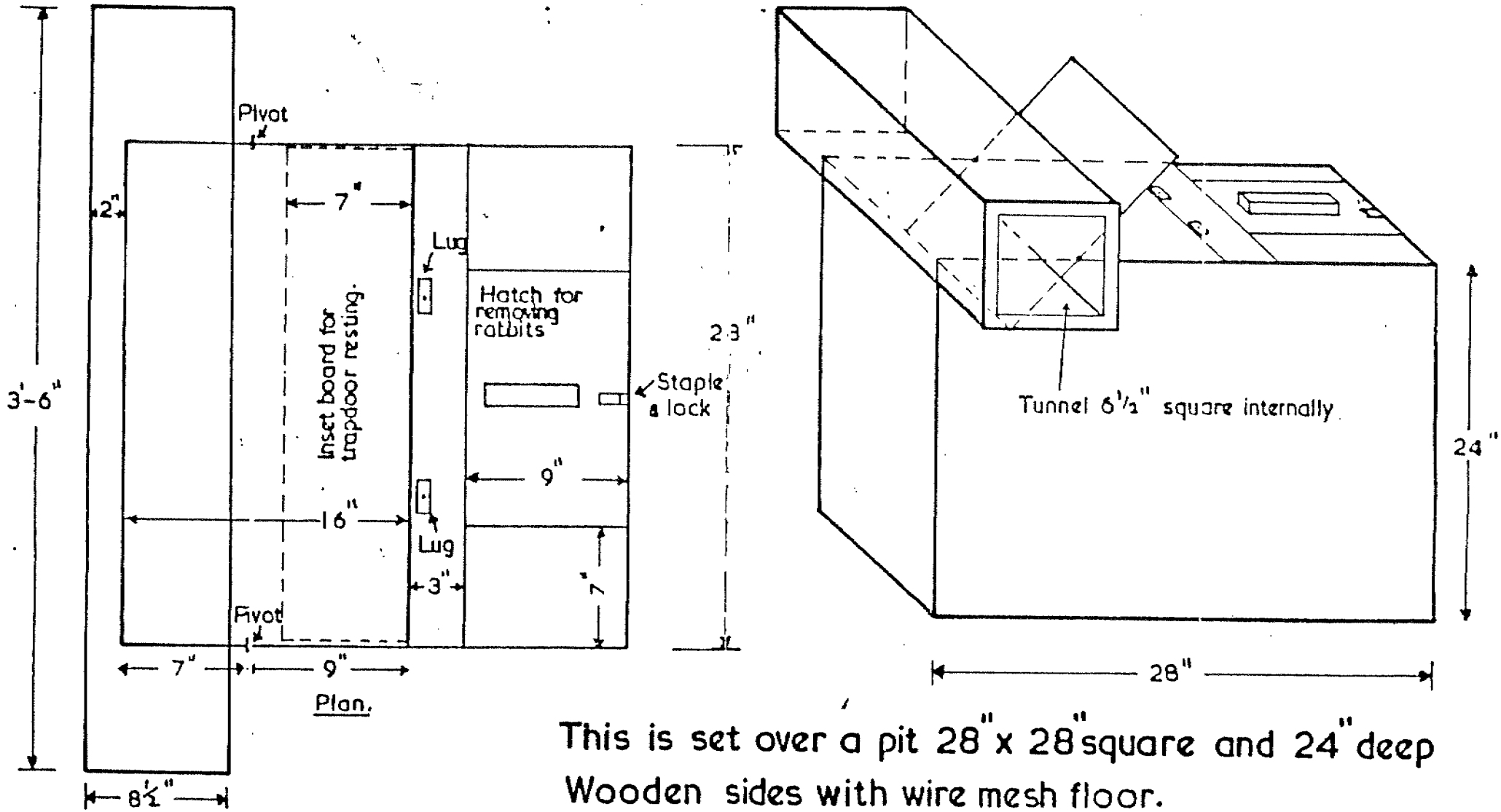
Grant aid for drop traps and associated fencing may be available under the following grant schemes (all subject to approval):

English Nature Wildlife Enhancement Scheme (SSSI land only)	*100% of costs or £60 - £100.*
Forestry Authority Woodland Grant Scheme.	*50% of costs under Woodland Improvement Grant (WIG) with possible 100% of costs under special Challenge Funding. Possible £25/ha Woodland Management Grant..*
MAFF Countryside Stewardship Scheme	*50% of costs of drop traps as special project, £0.60/m for rabbit and sheep netting, £0.80/m for line wire fencing, £1.20/m for sheep fencing.*
MAFF Environmentally Sensitive Areas Scheme	*80% of costs as part of Conservation Plan.*
Yorkshire Dales National Park	*90% of costs under Woodland Management Grant.*
Yorkshire Dales Millennium Trust	*90% - 100% of costs as part of a woodland scheme.*

Contacts

Suppliers of Drop Traps	*David Parker, Sunnybank View, Forelands, Bentham. LA2 7EX. 01524 410519.* *Bolton Abbey Forestry, The Estate Office, Bolton Abbey, Skipton. 01756 710533.*
Fencing contractors, rabbit control contractors, assistance with grants	*Contact lists and advice available from the Farming and Wildlife Advisory Group, South Parade, Northallerton. DL7 8SL. Contact Phil Lyth on 01609 783632.*

DROP TRAP FOR RABBITS



This is set over a pit 28" x 28" square and 24" deep
Wooden sides with wire mesh floor.

DEMONSTRATION & TRAINING IN CONSERVATION LAND MANAGEMENT

A New English Nature Service in the Yorkshire Dales

Identification & Costing of Nature Conservation Management Practices

Moorland Grip Blocking

Introduction

The wetter blanket bog moorlands of Northern England were the target for much grant-aided drainage work - or moorland gripping - from the 1960's to mid 1980's. 60% of the moorlands in the Yorkshire Dales National Park have been subjected to gripping, which generally cut a herring bone pattern of ditches at 22 yard (1 chain) intervals. It was thought that this drainage would result in more productive growth of the vegetation, benefiting sheep and grouse. Some gripping still takes place, largely as part of forestry schemes.

Moorland gripping can cause environmental problems, including:

- Loss of young birds, including grouse, as well as sheep and lambs, which fall into the vertical sided grips.
- Loss of wet flushes which support high populations of invertebrates, providing vital food for young birds.
- Damage to delicate bog moss vegetation, the very plants which built and maintain the internationally important blanket bogs with their unique breeding bird community.
- Causing erosion of the peat which is very vulnerable to damage once the surface vegetation is broken.
- Causing flash runoff and damaging floods by increasing the speed of runoff of rain from the hills and reducing the buffering effect of the blanket peat which previously acted as a "sponge", storing and slowly releasing rainwater.
- Adversely affecting upland rivers through increased siltation and increased runoff in wet times, and reduced flows in dry periods.

Objectives of Moorland Grip Blocking

Blocking grips can help to restore a more natural drainage pattern to moorland areas, countering many of the problems outlined above, including reducing erosion and restoring delicate vegetation, and in the longer term helping to restore a more natural hydrology to the river systems. Following blocking the grips should gradually re-colonise with sphagnum moss, or silt up and be colonised by adjacent vegetation such as cotton grass and rushes.

Specifications

Location - Some dams to block grips should always be located at the uphill end of a grip system, and not just in the middle or lower sections, in order to hold or slow the water flow. Grips chosen for blocking should include those which are actively eroding or which feed into hagged areas. Grips across level, or raised/basin mire areas should also be chosen, allowing other grips to infill naturally. Works should always be designed to avoid danger to livestock.

Spacing - Dam spacing should normally be such that the water level from the top of the dam reaches the base of the next uphill dam. This may not be practical for steeply cut and eroding grips, and here the objective should be to dam the higher feeder grips and hold back the water flow. In shallowly sloping to level situations, dams may be constructed at 10-15m intervals to slow the water down and speed up vegetation growth.

Construction - Dams should normally be of peat taken from adjacent land to a depth of 30cm and compacted into the grip. The length of the dam along the grip should be one or two times the width, and more for deeper grips. The dam height should normally be to the surrounding vegetation surface, ideally with overflow seepage to the sides, and not back into the original grip. A exception would be where this would create ponding of water

to a depth of more than 60cm, and thus a significant hazard to livestock. In such cases the dam height should be kept to 60cm. The value of using peat dams is that the vegetation readily re-colonises.

Dams in the wider or more eroded/ steeper grips may be strengthened by the insertion of timber posts or boards, or sheet piling, with peat compacted behind. This may be necessary to avoid leakage when damming grips through the more rapidly growing and less consolidated peats of raised/basin mire areas. Plastic piling is widely used to protect river banks against erosion, and is available in various weights and specifications. It has the advantage that it does not rust, and is light and easy to transport. Piling can be pushed into deep peat with an excavator bucket, and at least half, and up to two-thirds of the length of the pile should be buried in the peat. Manufacturers will provide advice on installation and how to achieve the best seal.

Types of Working - *Machine working* is most cost effective for any significant number of dams in one locality, and 360° tracked excavators (Hymac, Priestman, Kubota, etc) should be used as they have wide tracks and are lower ground pressure than wheeled machines. Special mats can be used to spread the weight of the machine of particularly sensitive sites.

Hand working is likely to be more appropriate for creating small numbers of dams in an area, or for works in steep or eroded situations too difficult for machine access.

Timing - Access for machines is obviously easier at drier times of year, but on some sites the peat may not always be wet enough to compact well. Seek to avoid major disturbance during the bird nesting season.

Costings

The figures below are given for guidance only, and are exclusive of VAT:

Tracked excavator including operator	*£125-£160 for 10 hour day plus transport to the site on a low loader (variable depending upon distance)*
Wheeled Digger including operator	*£100-£120/day (no transport required)*
Additional labour	*£50-£60 per man day.*
British Trust for Conservation Volunteers (BTCV)	*£95/day and £195/weekend for group of around 12.*
Plastic sheet piling	*£13-£16/m^2*

Grant aid

Grant aid for moorland gripping may be available under the following grant schemes:

English Nature Wildlife Enhancement Scheme (SSSI land only)	*100% of costs subject to approval.*
MAFF Countryside Stewardship Scheme	*50% of costs as special project, £40 for soil bund, £140 for timber sluice, £400 for concrete brick or stone sluice. All subject to approval.*

Contacts

Sheet piling manufacturers	*Bankmaster Systems Ltd., PO Box 39, Braconash Road, Leyland. PR5 3HW. Contact Charlie Jackson on 01772 456482* *Plastic Piling Ltd., Cottars Hall, Nethergate Street, Hopton. Nr. Diss. IP22 2QZ. Contact Alan Horsfall on 01953 688369.*
Contractors	*Contact list available from the Farming and Wildlife Advisory Group, South Parade, Northallerton. DL7 8SL. Contact Phil Lyth on 01609 783632.*
British Trust for Conservation Volunteers	*BTCV North Yorkshire Office, Kiplin Hall, Scorton. Richmond. DL10 6AT. Contact Hazel Kirby on 01748 811970.*

Note - In some situations consent may be required from the Environment Agency for creating dams to block grips. If in doubt they should be contacted on York (01904) 692296.