

Gross margin - Suckler Herd		1995/96			
22		Cows			
Output	No'/cow	Total No'	£/unit	£/farm	£/cow
Calves	0.93	20	459	9180	417.27
Suckler cow premium	1	22	143.04	3147	143.04
HLCA	1	22	47.5	1045	47.50
BSP		10	111.24	1112	50.56
Livestock depreciation				-1153	-52.39
Total output				13332	605.99
Variable costs					
Concentrates	1	22	70	1540	70.00
Vet & med	1	22	20.8	458	20.80
Other	1	22	32	704	32.00
Total variable costs				2702	122.80
Gross margin before forage				10630	483.19

Assumptions

Autumn calving herd, producing stores
 Calves sold/transferred at 10 - 13 months old
 Animals are housed over winter in straw yards 1t straw/cow
 Replacements bought in
 Suckler cow quota available for all suckler cows
 HLCA paid at SDA rate on all cows
 BSPS claimed on male animals at 10 months old
 Extensification premium obtained for suckler cow and BSP claims

Gross Margin - Sheep		1995/96			
		789	Ewes		
Output	No'/ewe	Total No'	£/unit	£/farm	£/ewe
Finished lamb	0.10	82	39	3198	4.05
Store lambs	0.42	328	32	10496	13.30
Ewe lambs	0.27	213	50	10650	13.50
Draft ewes		150	32	4800	6.08
Wool sales	1.8	1420	0.9	1278	1.62
Ewe premium (incl LFA)	1	789	26.95	21264	26.95
HLCA	1	789	5.75	4537	5.75
Ram depreciation				-2100	-2.66
Total output				54122	68.60
Variable costs					
Concentrates	1	789	7	5523	7.00
Vet & med	1	789	2.6	2051	2.60
Other	1	789	2.6	2051	2.60
Agistment		197	8	1576	2.00
Total variable costs				11202	14.20
Gross margin before forage				42921	54.40

Assumptions

Pure-bred, self-contained flock

Producing store and finished lambs and breeding females for sale (all sold at 6 mths old)

Rearing own replacements - first tupped as gimmers

All ewe hogs wintered away

HLCA paid at higher SDA rate

Draft ewes sold September

Forage costs		1995/96			
In-bye	58	Hectares			
Variable costs	No'/ha	Total No'	£/unit	£/farm	£/ha
Seed	1	58		56	0.97
Fertiliser	1	58	38.26	2219	38.26
Sprays	1	58		149	2.57
Other	1	58		77	1.33
Total variable costs				2501	43.12

Assumptions

Costs only apply to in-bye land

Fertiliser applied as 20:10:10 compound

	N	P	K	
Nutrients supplied kg/ha	50	25	25	on average over whole in-bye
20:10:10 equivalent	250	kg per ha		
Cost £/t	138			

Grazing pattern 1995/96

Common 151 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows												
calves												
replacement												
bull												
ewes	227	227	227		227	227	227	227	227			227
rams												
Lambs					227	227	227	227	227			
gimm-own												

Rough grazing 284 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows					22	22	22	22	22			
calves					20	20	20	20				
replacement												
bull												
ewes	562	562	562			530	530	530	530			562
rams												
Lambs						530	530	530	530			
gimm-own			197	197	197	197	197	197				

In-bye 58 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows												
calves									20			
replacement								3	3			
bull					1	1	1	1	1			
ewes				789	562	32	32	32	32	789	789	
rams	17	17	17	17	17	17	17	17	17	17	17	17
lambs					584	64	64	64	64	329		
gimm-own												

Away / housed

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows	22	22	22	22						22	22	22
calves	20	20	20	20						20	20	20
replacement												
bull	1	1	1	1						1	1	1
ewes												
rams												
lambs												
gimm-own	197	197										

Gross Margin - Suckler herd		1995/96			
	51	Cows			
	No'/cow	Total No'	£/unit	£/farm	£/cow
Output					
Calves	0.94	48	462	22176	434.82
Suckler cow premium	1	51	143.04	7295	143.04
HLCA	1	51	47.5	2423	47.50
BSP		24	111.24	2670	52.35
Livestock depreciation				-2243	-43.97
Total output				32321	633.74
Variable costs					
Concentrates	1	51	66	3366	66.00
Vet & med	1	51	22.1	1127	22.10
Other	1	51	36.2	1846	36.20
Total variable costs				6339	124.30
Gross margin before forage				25982	509.44

Assumptions

Autumn calving herd

Calves sold/transferred at 12 - 14 months old

BSPS claimed on male calves over 10 months old

Animals housed over winter on straw

Suckler cow quota available for all suckler cows

HLCA paid at SDA rate on all cows

Gross Margin - Sheep		1995/96			
	445	Ewes			
Output	No'/ewe	Total No'	£/unit	£/farm	£/ewe
Finished lamb	0.29	127	39	4953	11.13
Store lambs	0.49	216	32	6912	15.53
Ewe lambs	0.66	293	50	14650	32.92
Draft ewes		84	32	2688	6.04
Wool sales	2.3	1024	0.90	922	2.07
Ewe premium (incl LFA)	1	445	26.95	11993	26.95
HLCA	1	445	3	1335	3.00
Replacement ewes		111	-70	-7770	-17.46
Ram depreciation				-1086	-2.44
Total output				34596	77.74
Variable costs					
Concentrates	1	445	10	4450	10.00
Vet & med	1	445	4.8	2136	4.80
Other	1	445	3.9	1736	3.90
Total variable costs				8322	18.70
Gross margin before forage				26275	59.04

Assumptions

Mule production

Buying in replacements as gimmers

HLCA paid at lower rate SDA

Lamb early April

Forage costs		1995/96			
In-bye	96	Hectares			
Variable costs	No'/ha	Total No'	£/unit	£/farm	£/ha
Seed	1	96		330	3.44
Fertiliser	1	96	89.70	8611	89.70
Sprays	1	96		303	3.16
Other	1	96		473	4.93
Total variable costs				9717	101.22

Assumptions

Costs only apply to in-bye land

Fertiliser applied as 20:10:10 compound

	N	P	K	
Nutrients supplied kg/ha	130	65	65	on average over whole in-bye
20:10:10 equivalent	650	kg per ha		
Cost £/t	138			

Grazing pattern

Common

28 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows												
calves												
replacement												
bull												
ewes	42	42	42		42	42	42	42	42			42
rams												
Lambs					42	42	42	42	42			

Rough grazing

34 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows												
calves												
replacement												
bull												
ewes	212	212	212			212	212	212	212			212
rams												
Lambs						212	212	212	212			

In-bye

96 Ha

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows					51	51	51	45	45			
calves					48	48	48	48	48			
replacement								6	6			
bull					1	1	1	1	1			
ewes	191	191	191	445	403	191	191	191	191	445	445	191
rams	9	9	9	9	9	9	9	9	9	9	9	9
lambs					576	382	382	382	382	488		

Away / housed

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cows	51	51	51	51						51	51	51
calves	48	48	48	48						48	48	48
replacement												
bull	1	1	1	1						1	1	1
ewes												
rams												
lambs												

Livestock unit conversion factors

	LU/hd
Breeding cows	1
Calves	0.6
Replacements	1
Bulls	1
Breeding ewes	0.06
Rams	0.15
Lambs	0.04
ewe hoggs	0.04
gimmers	0.06

**DEMONSTRATION AND TRAINING IN CONSERVATION LAND MANAGEMENT
AN ENGLISH NATURE SERVICE IN THE COUNTRYSIDE**

CONSERVATION AND THE FARM BUSINESS

FARM 1 - BACKGROUND INFORMATION

INTRODUCTION

Conservation issues are of increasing importance to farmers in the UK, especially those in upland areas. Within the Yorkshire Dales a number of conservation schemes now affect farm businesses. **English Nature's** Wildlife Enhancement Schemes (WES) are available for Sites of Special Scientific Interest (SSSIs) and cover various land/habitat types. The Schemes offer annual payments per hectare at a set rate for each habitat (hay meadow, moorland etc.) which reflect the extra cost of managing the land in a wildlife-friendly way.

The increasing environmental pressures and complexity of schemes mean that it is important for all parties concerned to have an understanding of how the performance of the farm business may be affected by entry into such a scheme. In order to give some indication of this a number of farm case studies have been developed to enable the impact of the Wildlife Enhancement Scheme to be estimated.

Farm 1 is a representative hill farm of the Yorkshire Dales which has been developed from the Farm Business Survey (FBS) special study on hill farming for the 1995/96 year. The study includes Less Favoured Area (LFA) farms producing beef and sheep in the Yorkshire Region, the majority of which are located in the Yorkshire Dales.

Two farm types are identified in the study, Hill farms and Upland farms. Hill farms are those satisfying at least two of the following criteria:

- a) a ratio of rough and common grazing to in-bye is of least 5:1
- b) 50% or more of total grazing livestock units made up of sheep
- c) the grazing livestock density is two or more hectares per livestock unit

The structure and performance of Farm 1 is given below as the starting point for the various case studies. Farm 1 is then assumed to adopt separately the following Wildlife Enhancement Schemes operating in the Yorkshire Dales:

Case Study 1. North Pennine Moorland WES

Case Study 2. Craven Limestone WES

Case Study 3. Yorkshire Dales Meadows and Pastures WES

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FARM 1 - YORKSHIRE DALES HILL FARM

Farm 1 is a tenanted hill farm in the Yorkshire Dales and has a suckler herd of 22 breeding cows, producing 20 calves per year and a pure-bred sheep flock of 789 ewes with a lambing percentage of 104 lambs sold. The holding consists of:

Land area	Ha	Ac
In-bye	58	143
Rough grazing	284	702
Assessed common grazings	151	373
Total useable area	493	1218

Suckler Herd - Cows are Autumn calving and housed over winter between October and May. Beef Special Premium is claimed on male animals and all calves are sold at 10 - 13 months old as stores. Suckler cow quota is available for 22 cows and Suckler Cow Premium, Extensification Premium and Hill Livestock Compensatory Allowances at the SDA rate are claimed. The farm has an annual replacement rate of about 14% and all replacements are bought in.

Sheep Flock - The ewes are bred pure to produce flock replacements and ewe lambs for sale, along with store and some finished lambs. Lambing takes place in late April. Ewe lambs for replacements are away-wintered and all other lambs are sold before November. Replacements are first tupped as gimmers and the annual replacement rate is about 24%. Ewe quota is available for 789 ewes and Sheep Annual Premium and HLCA at the higher SDA rate are claimed.

Land Use - During the summer cows and calves graze the rough grazing land (most of which is enclosed) along with ewes with singles, draft ewes and gimmers. Common grazing provides grazing for about 225 ewes with lambs. All of the in-bye land can be cut and fertilised and is used to make silage for the cattle, hay for the sheep and to provide grazing for ewes with twins throughout the summer. At present fertiliser is applied at the rate of 50 kg/ha (40 units/acre) nitrogen, 25 kg/ha (20 units/acre) phosphate and 25 kg/ha (20 units/acre) potash averaged across all the in-bye land as a 20:10:10 compound. All winter fodder required can be provided by the farm and the average annual stocking rate is 0.22 livestock units per hectare.

DEMONSTRATION AND TRAINING IN CONSERVATION LAND MANAGEMENT
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Farm 1 - Financial Performance 1995/96

		£/farm	£/ ha	£/ac
Output				
Cattle	Calves	9180	19	8
	Suckler cow premium	3147	6	3
	HLCA	1045	2	1
	BSP	1112	2	1
Sheep	Finished lambs	3198	6	3
	Store lambs	10496	21	9
	Ewe lambs	10650	22	9
	Draft ewes	4800	10	4
	Wool sales	1278	3	1
	Ewe premium	21264	43	17
	HLCA	4537	9	4
Valuation adjustment		-3253	-7	-3
Total Farm Output		67454	137	55
Variable Costs				
Livestock	Concentrates	7063	14	6
	Vet & med	2509	5	2
	Other	2755	6	2
	Agistment	1576	3	1
Crop	Seed	56	0.1	0.05
	Fertiliser	2219	5	2
	Sprays	149	0.3	0.12
	Other	77	0.2	0.06
Total Variable Costs		16404	33	14
Farm Gross Margin		51050	104	42
Fixed costs				
	Labour - paid	2837	6	2
	Machinery	9274	19	8
	General farm costs	4239	9	3
	Rent	8402	17	7
Total Fixed Costs		24752	50	20
Profit Before Finance		26298	53	22

CONSERVATION AND THE FARM BUSINESS - FARM 1

CASE STUDY 1

**NORTH PENNINE MOORLAND
WILDLIFE ENHANCEMENT SCHEME**

INTRODUCTION

The North Pennine Moorland Wildlife Enhancement Scheme operates in areas making up the North Pennine Moorland Sites of Special Scientific Interest (SSSIs). The main objective of the scheme is to maintain and enhance the wildlife interest of existing heather ground through positive management.

Management guidelines:

- Grazing must be managed to maintain or enhance the heather;
 - Cattle should not be grazed on heather ground;
 - At least the same proportion of sheep should be away-wintered as at present;
 - No artificial fertilisers, farmyard manure or lime can be used;
 - Stock feeding in the SSSI area must be kept to a minimum;
 - The following stocking rates usually apply:
- | | | | |
|--------|-------------------------|-------------|---------------|
| Winter | 1 October - 28 February | 1 ewe/ha | (0.4 ewes/ac) |
| Summer | 1 March - 30 September | 1.5 ewes/ha | (0.6 ewes/ac) |

IMPLICATIONS FOR FARM 1

Farm 1 has a suckler herd of 22 breeding cows, producing 20 calves per year and a pure-bred sheep flock of 789 ewes with a lambing percentage of 104 lambs sold. There are 284 ha (702 ac) of rough grazing, 151 ha (373 ac) of common land and 58 ha (143 ac) of in-bye land. The profit for the 1995/96 year was £26,298.

Scenario 1 - Half of the rough grazing land (142 ha) and all of the common land (151 ha) falls within the SSSI - The current grazing pattern and above restrictions mean that the farm is overstocked from May to September by up to about 282 ewes with lambs, and from December to February by about 44 ewes (assuming that the stocking rate on other areas remains the same). The stocking rates on the common land already fall within the limits of the Scheme, therefore the utilisation of the rough grazing needs consideration. To enable the farm to meet the criteria there are a number of options the farmer may consider, e.g.:

- Option 1a - Rent additional land**
- Option 1b - Buy all hay in and rent additional land**
- Option 1c - Reduce stock numbers by selling off-farm**
- Option 1d - Intensify the grazing on in-bye land**

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

Original profit for 1995/96 = £26,298

<p>Option 1a - Rent additional land Remove cattle from the rough grazing to meet the stocking rate limit of 1.5 ewes/ha during the summer. There is insufficient grazing area on the in-bye land to accommodate the cattle due to the large proportion of in-bye which is used to provide winter fodder. Therefore sufficient land must be rented to graze all cattle. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 44 ewes.</p>	<p>Rent 86 ac @ £120 /ac = £10,320 Agistment 44 ewes @ £8/head = £352 WES payment = £2,779</p> <p align="center">Revised profit = £18,405</p>
<p>Option 1b - Buy all hay in and rent additional land Remove cattle from the rough grazing to meet the stocking rate limit of 1.5 ewes/ha during the summer. All hay is bought-in rather than made on farm. This releases in-bye land for grazing. If the grazing stocking rate is increased to 7 ewes/ha through increased grazing efficiency, 8 cows and 7 calves can be accommodated on the in-bye land. Therefore land will have to be rented to graze the remaining cattle. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 44 ewes. A cost for away-wintering these animals is included.</p>	<p>Hay 31 t @ £75/t = £2,325 Rent 54 ac @ £120 /ac = £6,480 Agistment 44 ewes @ £8/head = £352 WES payment = £2,779</p> <p align="center">Revised profit = £19,820</p>
<p>Option 1c - Reduce stock numbers by selling off-farm Remove cattle from the rough grazing to meet the stocking rate limit of 1.5 ewes/ha during the summer. Reducing herd size by 12 cows reduces the amount of land required for silage and releases enough land to allow the remainder of the cattle to graze the in-bye land, as long as the grazing stocking rate on the in-bye is increased to 7 ewes/ha through increased grazing efficiency. All winter fodder is made on the in-bye land. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 44 ewes.</p> <p>Capital released - Suckler quota 12 units @ £100/unit = £1,200; cows sold 12 cows @ £500/cow = £6,000. Total £7,200</p>	<p>Income lost from cattle 12 cows @ £483 /head = £5,796 Agistment 44 ewes @ £8/head = £352 WES payment = £2,779</p> <p align="center">Revised profit = £22,929</p>
<p>Option 1d - Intensify the grazing on in-bye land Increasing stocking rates on the in-bye land to the equivalent of 12 ewes/ha (5 cws/acre) would enable suckler numbers to be maintained at present levels and grazed on the in-bye land rather than the rough grazing. This would require an increase in fertiliser use to 125 kg N /ha (100 units/acre) and an increase in grazing efficiency, and is only possible if half of the hay required is bought-in. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 44 ewes.</p>	<p>Increased fertiliser cost = £3,002 Hay 15 t @ £75/t = £1,125 Agistment 44 ewes @ £8/head = £352 WES payment = £2,779</p> <p align="center">Revised profit = £24,598</p>

Scenario 2 - All of the rough grazing and common land (435 ha) falls within the SSSI

- The current grazing pattern and above stocking rate restrictions mean that the farm is overstocked from May to September by up to about 565 ewes with lambs, and from December to February by about 89 ewes (assuming that the stocking rate on other areas remains the same). To enable the farm to meet the criteria there are a number of options the farmer may consider, e.g.:

- Option 2a - Rent additional land**
- Option 2b - Buy all hay in and rent additional land**
- Option 2c - Reduce stock numbers by selling off-farm**
- Option 2d - Intensify the grazing on in-bye land**

Original profit for 1995/96 = £26,298

<p>Option 2a - Rent additional land Remove cattle from the rough grazing along with about 222 ewes with lambs to meet the stocking rate limit of 1.5 ewes/ha during the summer. If the grazing stocking rate is increased to 7 ewes/ha through increased grazing efficiency there is sufficient grazing area on the in-bye to accommodate about 57 ewes with lambs. Therefore land must be rented to graze all cattle along with 165 ewes with lambs. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 89 ewes.</p>	<p>Rent* 127 ac @ £120 /ac = £15,240 Agistment 89 ewes @ £8/head = £712 WES payment = £3,205</p> <p align="center">Revised profit = £13,551</p>
<p>Option 2b - Buy all hay in and rent additional land Remove cattle from the rough grazing to meet the stocking rate limit of 1.5 ewes/ha during the summer. All hay is bought-in rather than made on farm. This allows about 133 ewes with lambs to be grazed on the in-bye as long as the grazing stocking rate is increased to 7 ewes/ha through increased grazing efficiency. Land will have to be rented to graze the cattle and 89 ewes with lambs. In addition the number of animals grazing the rough grazing during the winter must be reduced by about 89 ewes.</p>	<p>Hay 31 t @ £75/t = £2,325 Rent 108 ac @ £120 /ac = £12,960 Agistment 89 ewes @ £8/head = £712 WES payment = £3,205</p> <p align="center">Revised profit = £13,506</p>
<p>Option 2c - Reduce stock numbers by selling off-farm Remove cattle from the rough grazing to meet the stocking rate limit of 1.5 ewes/ha during the summer. Reducing herd size by 12 cows and ewe numbers by 140 ewes with followers releases enough land from silage and hay to allow the remaining cattle and 67 ewes with lambs to graze the in-bye land. However, to achieve this level of stocking the grazing stocking rate on the in-bye needs to be increased to 8 ewes/ha. This will require increased grazing efficiency and an increase in the level of fertiliser to 65 kg/ha N (52 units/acre) so that all winter fodder can continue to be made on the in-bye land.</p> <p>Capital released - Suckler quota 12 units @ £100/unit = £1,200; cows sold 12 cows @ £500/cow = £6,000. Ewe quota 140 units @ £35 = £4,900; ewes sold 140 ewes @ £40/head = £5,600. Total £17,700</p>	<p>Income lost from cattle 12 cows @ £483 /head = £5,796 Income lost from sheep 140 ewes @ £54 /head = £7,560 Increased fertiliser cost = £600 WES payment = £3,205</p> <p align="center">Revised profit = £15,547</p>
<p>Option 2d - Intensify the grazing on in-bye land Suckler numbers could be maintained at present levels and grazed on the in-bye land by increasing stocking rates on the in-bye land to the equivalent of 12 ewes/ha (5 ewes/acre). This would require increased fertiliser use to 125 kg/ha N (100 units/acre) and an increase in grazing efficiency. All winter fodder can be made on the in-bye. In addition ewe numbers would have to be reduced by about 200 ewes with followers to meet the stocking rate restrictions.</p> <p>Capital released - Ewe quota 200 units @ £35 = £7,000; ewes sold 200 ewes @ £40/head = £8,000. Total £15,000</p>	<p>Increased fertiliser cost = £3,002 Income lost from sheep 200 ewes @ £54 /head = £10,800 WES payment = £3,205</p> <p align="center">Revised profit = £15,701</p>

DISCUSSION

The implications for the farm are somewhat different depending on the proportion of land affected by the Scheme. Options a and b in each case rely on the availability and cost of land to rent for summer grazing and/or the availability and cost of bought-in hay. Summer grazing land 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. Relying heavily on bought-in hay can be very risky and expensive depending on the season, and may have conservation implications for the in-bye land. As well as exposing the business to more risk, both of these options have the greatest effect on farm profit and would therefore be unlikely.

Intensification through increased fertiliser use, stocking rates and grazing efficiency has the least effect on farm profit in both cases. However, a change of this nature would require a change in approach to grassland management. The level of intensification considered could also have conservation implications for the in-bye land.

Reducing stock numbers has the second largest effect on farm profit, but also has other benefits. Capital is released that could be put to other uses. The requirement for winter fodder is reduced along with the workload, particularly during the winter months. Where cattle numbers are reduced building space will also be released that could be used for other things, e.g. lambing ewes inside, in-wintering sheep or housing lambs for finishing over winter.

In both scenarios it would therefore seem that the most likely option would be a combination of intensification and reducing stock numbers. The extent of which will depend on land quality and personal circumstances.

* 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.