

Costing conservation grazing – a comparison of two heathland grazing schemes in South-East England.

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Abstract

The financial accounts of two conservation grazing schemes in Sussex are analysed. The comparative economics are discussed and implications for the future of such projects examined. The investigation finds that the Sussex Pony Grazing and Conservation Trust (SPGCT) deliver a lower 'per grazing unit' cost than the Conservators of Ashdown Forest. However, the findings highlight the complexities in making a 'true' comparison and the consequent difficulties in evaluating costings for management prescriptions. Greater knowledge sharing and the development of a framework for accounting procedure in conservation grazing schemes are suggested.

Introduction

Despite being widely utilised as a method of habitat management in the UK, conservation grazing has attracted some debate as to the significance of the ecological benefits it yields. It is disputed by some that there is sufficient scientific evidence of its efficacy to warrant such ubiquitous support and claims that arguments in favour of the use of grazing livestock are based largely on anecdotal evidence and an ideology that the 'traditional' form of management is the 'preferable' form of management (Thomas, 2009).

Some experts contend however that the lack of evidence could be due to more to the 'intrinsic subtlety' and slow pace of results (Marrable, 2004), while others suggest that the mismanagement of grazing schemes has distorted the data (Newton *et al*, 2009). More recently, scientific evidence has begun to emerge that emphasises that with refinement to grazing regime and livestock type/breed selection, grazing can produce positive effects such as increased biodiversity and ecosystem functioning (Rook *et al*, 2004, Lake *et al*, 2001). Such validation, along with additional merits such as support for rare breeds and cultural

and landscape heritage, make it likely that consensus amongst conservation practitioners on the applicability of conservation grazing is set to continue.

At a time of uncertainty over future government funding, the long-term sustainability of grazing schemes will no doubt be dependent on aspects of their performance other than just the ecological. The economics of conservation grazing is a subject largely overlooked in the literature, something that the Grazing Advice Partnership (GAP) have been keen to address. They developed a downloadable 'tool' called the 'Ready Reckoner', designed to aid cost projection for those entering into conservation grazing plans (GAP, 2009). Their online discussion forum 'Nibblers' also provides some of the most useful information available, because there, 'real-life' conservation graziers share experience and knowledge. Archives show examples of discussions about costs and requests for information from graziers 'in the dark' over financial planning (Nibblers, 2006).

Whilst the subject of economics is introduced within several general overviews of conservation grazing (English Nature, 2005; Oates and Tolhurst, 2000; Kampf, 2002) and receives some consideration within broader themes such as extensive versus intensive systems (Mills *et al*, 2007), there is still a conspicuous lack of literature that deals specifically with the costing of conservation grazing schemes, with some notable exceptions. Dr Richard Small and Dr Bill Grayson have produced arguably the most clear and comprehensive writing on the subject for the UK to date. In 2007 they published a paper that outlined the step-by-step process of their own cost projections for a heathland grazing project in the Stiperstones SSSI, Shropshire (Grayson and Small, 2007). Richard Small has also presented other discursive evaluations of conservation grazing and factors affecting its economic viability (Small, 2010). Whilst it is acknowledged that cost-cutting should not compromise conservation objectives, experts are beginning to recognise that finances may require more thorough assessment and refinement if grazing is to remain a viable option.

This report aims to further that discussion by offering as examples, the accounts of two conservation grazing schemes in Sussex. There are some key intended outcomes of this process;

- to identify areas of similarity or difference that might highlight more cost-effective methods of achieving goals.
- to illuminate inherent issues in the process of comparison itself that may offer some explanation for the lack of such investigation to date and thus facilitate a remedy.
- to set a precedent for knowledge sharing amongst conservation graziers.

It is an important tenet of this investigation that it is not looking to find one scheme superior over the other; firstly, because the two are not direct equivalents and secondly, it is not possible within the scope of this study to examine all the variables that could be considered relevant in such an undertaking.

The following section will give a brief introduction and background to the two grazing schemes and outline the methods used to obtain, process and present their financial data. The findings are displayed in the results section and a detailed analysis given in the discussion, where it is aimed to highlight any issues with the chosen methods, offer some possible explanations for the results and investigate these findings within the context of recent literature.

Methodology

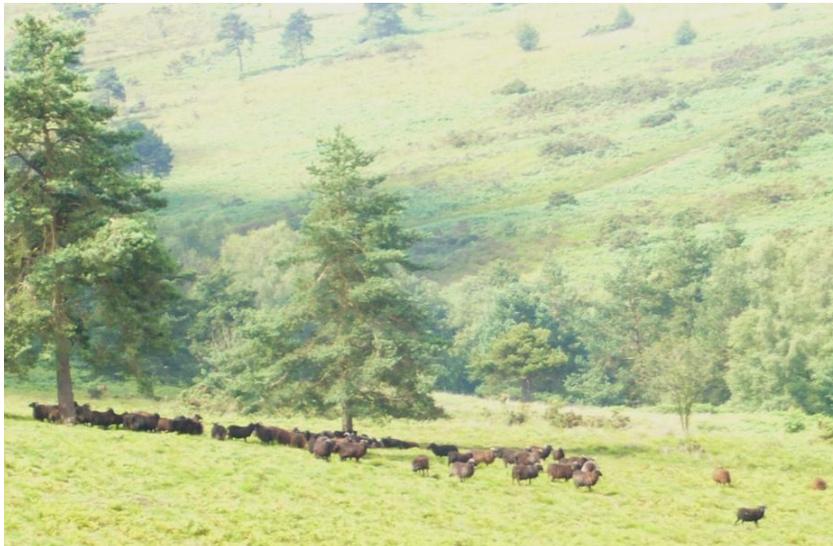
The two conservation grazing schemes chosen for comparison are the Conservators of Ashdown Forest (henceforth: Ashdown) and the Sussex Pony Grazing and Conservation Trust (SPGCT). They were selected primarily because of the author's personal association with and therefore access to the schemes but are in no way compromised in terms of relevance for that. Whilst operating in the same vicinity and often grazing similar habitats (therefore subject to same environmental conditions), they in fact represent quite different approaches to conservation grazing and so provide a useful platform from which to examine points of difference and similarity. In UK agricultural terms, the SPGCT represents a non-commercial approach, running a herd of non-breeding Exmoor ponies with no production value beyond the conservation gains. Ashdown represent a semi-commercial approach in their use of sheep (a commercial animal), running a flock of breeding ewes, yet retaining most of the lambs to expand the flock and using a breed (Hebridean) chosen for its proven abilities of utilising heathland forage rather than its high commercial value (Newborn, 2000).

It was initially intended to include a third example, Townings Farm, who have this year entered into an agreement to graze another Sussex heathland site, Chailey Common, for conservation purposes. This was to represent a more commercial approach, a farmer hoping to make returns from sales of the meat. Due to delays in the commencement of the project and the relative youth of the scheme it has been decided that the inclusion of any financial analysis would be too speculative to provide robust data. The commercial approach is an important consideration however so the Townings Farm example will be included in discussion where appropriate. A brief introduction to the two chosen organisations is given below:

Ashdown

Ashdown Forest in East Sussex (See Figures 1 and 2) covers an area of 2,467 hectares, 60% of which is heathland. It is the largest area of lowland heathland in south-east England and is recognised as an important ecological site by its designations as a Site of Special Scientific Interest (SSSI) under UK legislation, Special Area of Conservation (SAC) under European law and Special Protection Area (SPA) status for its birds, as well as being part of the Natura 2000 Network (Ashdown Forest, 2012).

Traditionally the Forest was utilised by commoners who grazed and cut the vegetation, thus preventing its succession to woodland. Today the open heath and woodland are managed in other ways and few commoners exercise their rights to graze. The management is overseen by a Board of Conservators which was established in 1885 through an Act of Parliament (Marrable, 2003). As part of their wider management strategy the Conservators run a



grazing project that currently keeps a flock of up to 300 Hebridean sheep (See Figure 1) and a herd of 5 Riggitt Galloway cattle that graze various sites across Ashdown Forest throughout the summer months. The cattle, as a relatively new addition have not been included in the analyses.

Figure 1: Part of the Ashdown flock grazing on the heathland at Wrens Warren in summer 2012.

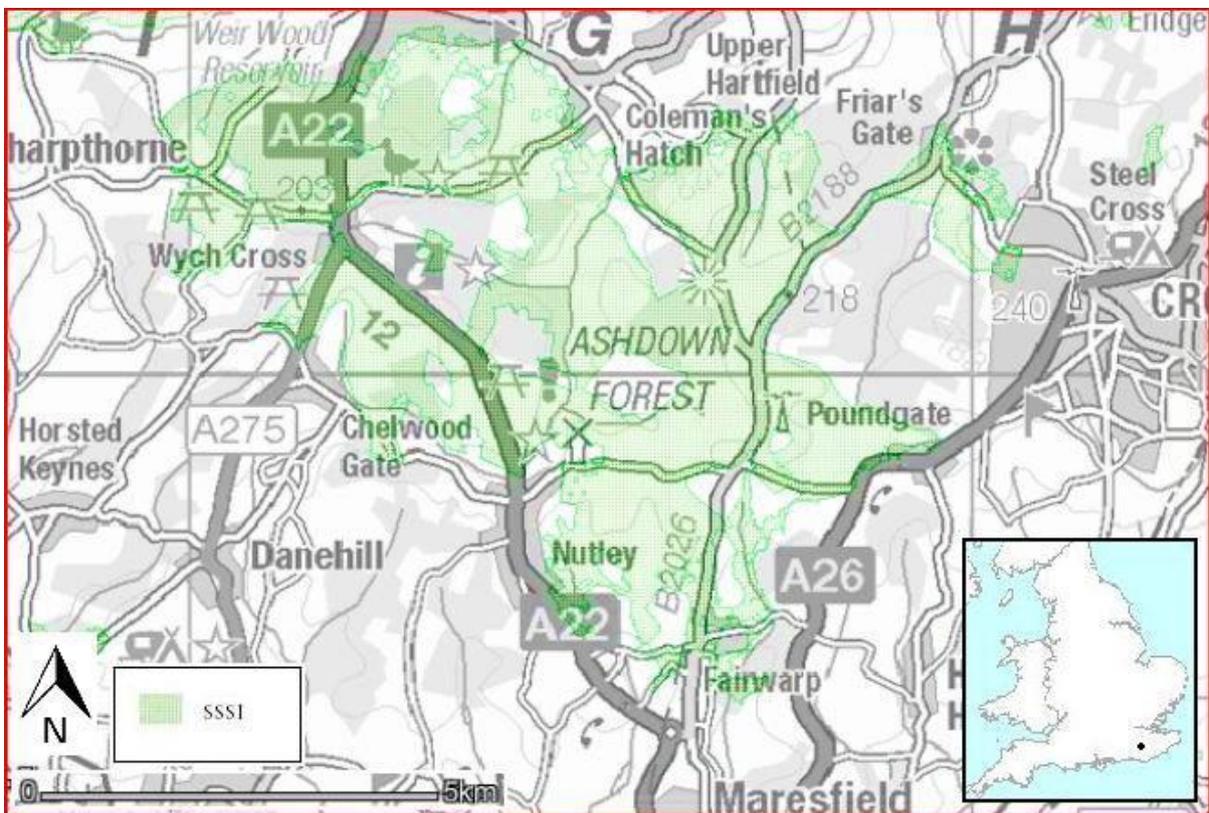


Figure 2: Map to show the location and extent of Ashdown Forest (after Defra, 2012).
 Note: Ashdown Forest Conservators manage the majority but not all of the SSSI designated area.

The grazing project was first set up in 2007 as a three-year close-shepherded feasibility study, conducted by Louise Amos. She began with an initial flock of 50 breeding ewes and one ram and numbers built from there. Although the project was a success, the decision was taken at the end of the trial to continue the grazing flock but to use temporary enclosures on the Forest instead of the close-shepherding technique, with high costs cited as one of its drawbacks (Amos, 2010). A new Grazing Officer was appointed, Caroline FitzGerald who tends the flock to this day. This study spans both of those periods with some potential impacts on the results which will be addressed in the discussion.

It is worth note that there is also an enclosed grazing area of 547 hectares on Ashdown Forest, grazed by one commoner who is awarded a headage payment. That enterprise is not the subject of investigation here.

SPGCT

The Sussex Pony Grazing and Conservation Trust manage a herd of Exmoor ponies for conservation grazing of heathland and chalk grassland sites across the county of Sussex. The herd currently totals 55 ponies that are split into several smaller groups, according to site requirements. The Trust were officially established in 2005 but grew out of a previous project run by the Sussex Downs Conservation Board. They are an independent charitable trust and so graze in liaison with and on behalf of other organisations, including, Natural England, Defence Estates, RSPB, Sussex Wildlife Trust, East Sussex County Council, National Trust, Woodland Trust and private landowners. The majority of sites grazed fall under SSSI status. The organisation is presided over by a Board of Trustees and the day-to-day running carried out by Monty Larkin, with help from a large number of volunteer 'lookers'. Amongst the sites grazed by the SPGCT are three areas of heathland that fall within the geographical region of Ashdown Forest but outside the legislative boundary governed by the Board of Conservators. Ponies are pictured in Figure 3 grazing one of those sites; Pippingford Park Training Area.



Figure 3: Some of the SPGCT's Exmoor ponies grazing Pippingford Park Training Area, 2012.

Data

The data for analysis of the accounts of the two organisations were collected and collated. The period between 2007 and 2011 was chosen because it is the longest period for which both projects' full year's data exists. As a registered charity the recent accounts of the SPGCT were available on the Charity Commissions website (Charity-Commission, 2012). Additional year's accounts were provided directly by the Trust treasurer. In presenting these accounts every effort has been made to adhere to the published format as SPGCT's follow required charities protocol. Because the Trust operates just the sole enterprise of grazing ponies, the accounts needed very little processing to illicit the information required for these purposes. In contrast, data for the accounts of the Ashdown grazing project were available only in raw format (excel spreadsheets of receipts in and out), as within the accounting department they are beyond that point, treated within the broader finances of the 'conservation' section of the 'general' account. For the reasons described above and for ease of comparison it was decided that Ashdowns' data should follow the general format of SPGCT's accounts, with some exceptions due to the peculiarities of the different enterprises.

Notes on treatment of accounts:

SPGCT -

- There has been some rearrangement of costs categories to bring them in line for comparison with Ashdowns'.
- All five years of accounts have been consolidated into one table for ease of viewing.
- The inclusion of capital expenditure in the income account is a quirk of charity accounting (see notes in the appendix).
- Expenditure has been separated into fixed and variable costs for the sake of analysis.

Ashdown –

- Some items have been added to capital that were not deemed to qualify at the time of their purchase, for the sake of continuity with SPGCT.
- The 25% reducing balance methodology has been applied to depreciation, in accordance with SPGCT accounting convention. Ashdown do not in fact depreciate capital.
- Having been interpreted from raw data all calculations have been made by the author. Some figures may differ slightly from figures printed elsewhere because of departures made from Ashdowns' own accounting conventions.

Notes on calculations

For the calculation of theoretical HLS revenue in Boxes 3.1 and 3.2, a stocking rate of $0.5\text{LUha}^{-1}\text{yr}^{-1}$ (LU = Livestock Unit) was applied, which represents the upper limit recommended for heathland (Underhill-Day, 2006). This was chosen as it was deemed likely to reflect the closest outcome to reality in these examples. The precise reasons for this are

too complex to describe here, the most critical thing being that the same stocking rate was applied to both and equivalent LU's used (Lake *et al*, 2001).

Sheep numbers were taken as mid-year total flock after lambing. More conventional farming accounts would more likely refer to breeding flock numbers but because in the case of Ashdown the majority of lambs and wethers are retained, total flock was considered more appropriate.

For calculation of the value of the sheep flock a cost per ewe of £45 was used, representing the purchase price of the original flock and a fair average of standard market values for the period (Eblex, 2012).

Funding for the grazing project comes out of Higher Level Stewardship (HLS) area payments awarded to the Conservators of Ashdown Forest for the conservation of the heathland, not for grazing exclusively. The grazing project is then 'budgeted for' rather than allocated a set amount. This poses a problem in drawing up accounts for analyses here. The figures entered for 'income' in the 'grants' category of the income and expenditure table (Table 1) are equal to the total expenditure for the year. The implications of this on interpreting these accounts are considered in the discussion.

Results

The accounts presented here are with the permission and at the discretion of the bodies concerned and have been approved before publishing.

Boxes 1 and 2 give an overview of the financial activity of Ashdown and SPGCT respectively, showing mean data for the whole study period and the most recent data for 2011. The figures show some significant differences between the two organisations and some change over time within the organisations themselves. Firstly it is evident that Ashdown's income and expenditure are greater than that of SPGCT but that this does not signify higher revenue, with surplus figures over the period very similar. Income and expenditure both increased in 2011 in the case of Ashdown, whilst expenditure rose for SPGCT despite income falling sharply.

Both spend a high percentage on fixed costs over variable costs, the ratio weighted slightly more towards fixed costs for SPGCT. The distribution of those costs across categories is displayed in the pie charts.

The graphs in Figures 4 and 5 allow for a closer examination of costs trends over the study period. Overall they show similar trends to one another with variable costs fluctuating only slightly, remaining relatively low for both and fixed costs, steadily increasing over time, although peaking in 2010 in the case of Ashdown and 2011 for SPGCT.

BOX 1: Ashdown summary financial data.

All figures represent mean values for the period 2007-2011, unless stated otherwise.

Sheep flock: 196

Equivalent Livestock units (LU's): 19.6

Mean annual income

Total income: £68,625

of which:

- HLS = £67,603
- Other income = £1,140

2011

£76,828

£73,841

£2,987

Mean annual expenditure

Total costs: £64,162

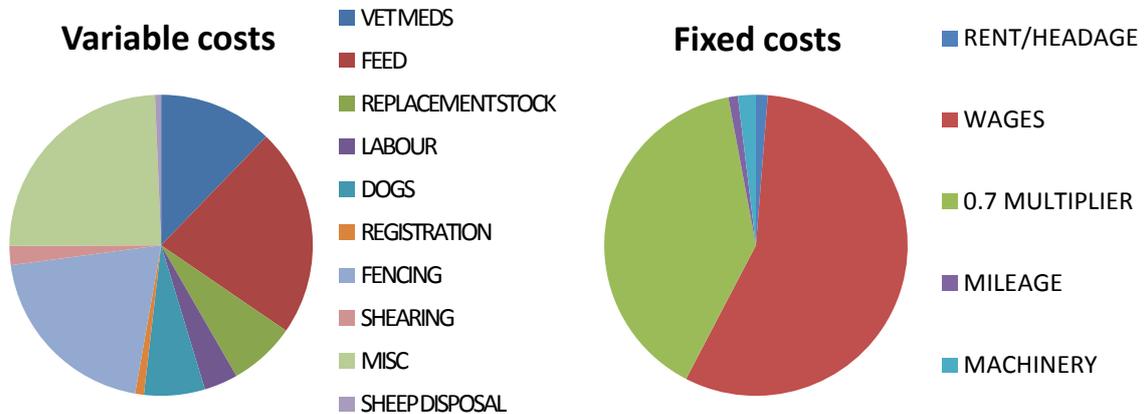
of which:

- Variable costs = £12,747 (20%)
- Fixed costs = £51,415 (80%)

£71,829

£13,027 (18%)

£58,802 (82%)



Surplus (before depreciation): £4,963

*Balances are displayed in the full accounts.

BOX 2: SPGCT summary financial data.

All figures represent mean values for the period 2007-2011, unless stated otherwise.

Pony herd: 51

Equivalent Livestock units (LU's): 76.5

Mean annual income

Total income: £26,984

of which:

- Grazing revenue = 17,118
- Other income = 9,866

2011

£18,737

£14,994

£3,743

Mean annual expenditure

Total costs: £22,176

of which:

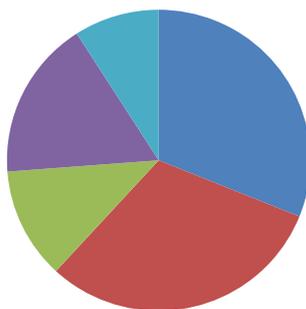
- Variable costs = £2,810 (13%)
- Fixed costs = £19,366 (87%)

£26,125

£3,286 (13%)

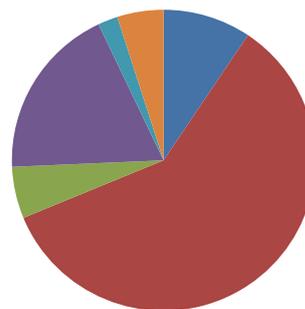
£22,839 (87%)

Variable costs



■ VET MEDS
■ STOCK TRANSPORT
■ GRANT SEED
■ FENCING
■ OTHER SERVICES

Fixed costs



■ STORE RENTAL
■ WAGES
■ INSURANCE
■ VEHICLE
■ PUBS AND SUBS
■ ADMINISTRATION

Surplus (before depreciation): £4,808

*Balances are displayed in the full accounts.

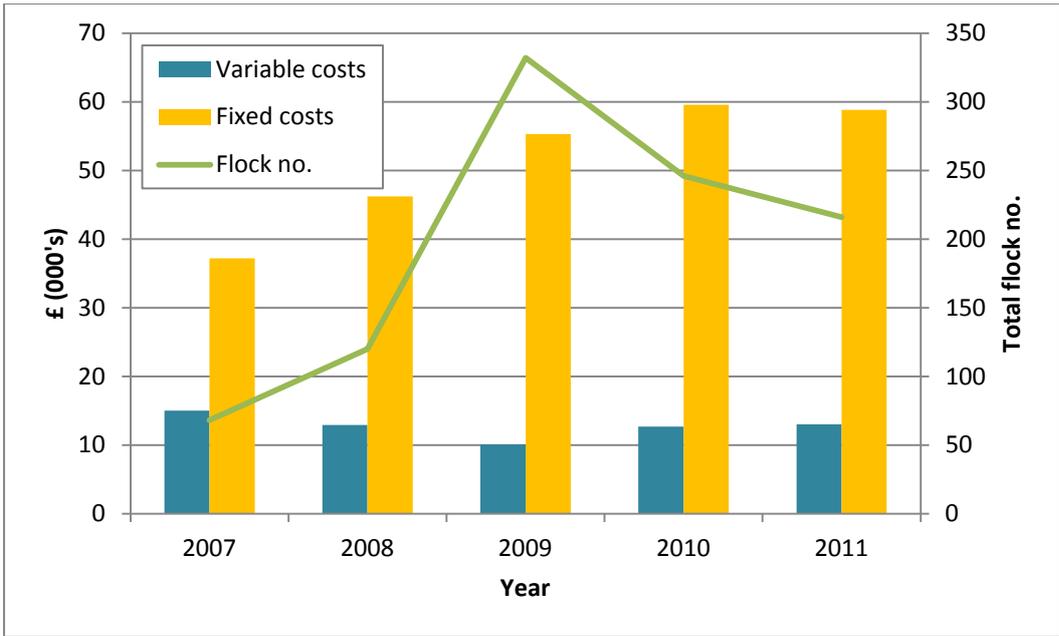


Figure 4: Ashdown costs trends and total flock number for the period 2007-2011.

*Note: different vertical scales.

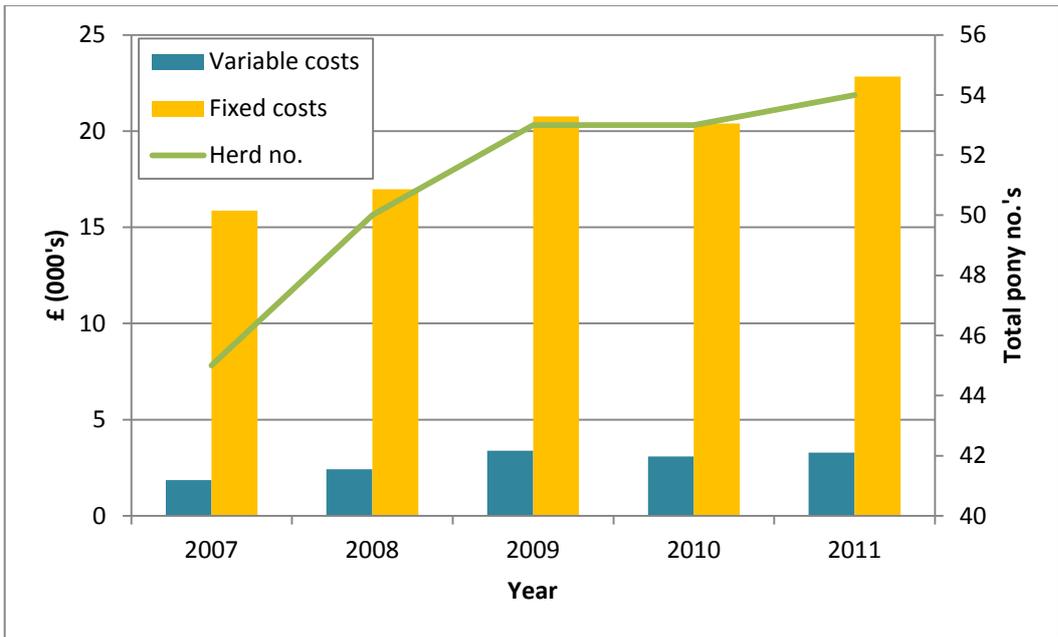


Figure 5: SPGCT costs trends and total herd number for the period 2007-2011.

*Note: different vertical scales.

Flock and herd trend lines indicate a strong relationship between animal numbers and costs for SPGCT, whose fixed costs in particular, seem to be influenced by pony numbers. There is also some correlation between flock number and costs for Ashdown but this is likely affected by the greater fluctuation in animal numbers due to breeding, selling and higher mortality rates in sheep.

Table 1: Ashdown Forest Grazing Project Income and Expenditure Account 2007 – 2011.

	2007	2008	2009	2010	2011
	£	£	£	£	£
INCOME					
GRANTS	54,364	62,403	69,569	77,840	73,841
DONATIONS	1,162	80	30	100	268
SPONSORSHIP	45	61			
SALES					
MEAT					558
WOOL		216	227	308	79
STOCK				484	2,082
TOTAL INCOME	55,571	62,760	69,826	78,732	76,828
EXPENDITURE					
FIXED COSTS					
RENT/HEADAGE	893	1,000	306	547	472
WAGES	20,627	25,674	31,418	33,596	33,596
0.7 MULTIPLIER	14,440	17,971	21,993	23,518	23,518
MILEAGE	694	316	203	517	869
MACHINERY	549	1,236	1,380	1,395	347
TOTAL FIXED COSTS	37,203	46,197	55,300	59,573	58,802
VARIABLE COSTS					
VET MEDS		1,209	1,586	2,349	1,527
FEED		2,497	1,940	3,531	4,315
REPLACEMENT STOCK	2,740	1,120	656		368
LABOUR			56	2,014	390
DOGS	874	761	1,433	1,195	180
FENCING	8,609	3,375	430	139	1,236
MISC	2,804	3,977	3,970	3,444	5,011
TOTAL VARIABLE COSTS	15,027	12,939	10,071	12,672	13,027
TOTAL EXPENDITURE	52,230	59,136	65,371	72,245	71,829
SURPLUS BEFORE DEPRECIATION	3,341	3,624	4,455	6,487	4,999
CAPITAL DEPRECIATION	3,341	3,624	4,455	6,487	4,999
SURPLUS FOR YEAR	0	0	0	0	0

Table 2: Ashdown Forest Grazing Project Balance Sheet 2007 - 2011.

	2007	2008	2009	2010	2011
	£	£	£	£	£
FIXED ASSETS					
VEHICLES	5,996	4,497	8,585	15,372	11,529
TRAILERS	3,362	2,522	1,891	1,922	1,441
FIELD EQUIPMENT	664	3,853	2,889	2,167	2,028
SHEEP FLOCK	3,060	5,400	14,940	11,070	9,720
TOTAL	13,082	16,272	28,305	30,531	24,718
CURRENT ASSETS					
DEBTORS					
CASH AT BANK AND IN HAND					
STOCK					
CREDITORS					
DUE IN ONE YEAR					
NET CURRENT ASSETS					
TOTAL ASSETS	13,082	16,272	28,305	30,531	24,718
SURPLUS BROUGHT FORWARD	0	0	0	0	0
SURPLUS FOR YEAR	0	0	0	0	0

Further detail is provided in Tables 1, 2, 3 and 4, which display the income and expenditure accounts and balance sheets of the two grazing schemes. It is clear that the main source of income, in both cases, arises from HLS funding, either directly, to Ashdown or indirectly, through grazing revenue to SPGCT. Almost all grazing revenue paid to SPGCT comes out of HLS funding awarded to the respective landowners (pers comm. Larkin, 2012). SPGCT also gain a significant portion of income from other sources, those of grants and donations. A reduction in that category was in part the cause of the steep fall in income in 2011, to below 2007 levels. A fall in grazing revenue that year, despite pony herd numbers remaining stable, would appear to be another contributing factor. At the same time, expenditure continued to rise, resulting predominantly from increases in fixed costs, namely vehicle, insurance and wages. Ashdown show some direct returns from their enterprise in sales of meat, wool and stock, which although marginal, are increasing year on year. The tables show that the differences in expenditure between the two schemes are largely due to greater wage and 0.7 multiplier costs for Ashdown. The 0.7 multiplier is a figure the Conservators apply on all staff salaries to cover all internal costs.

Table 3: SPGCT Income and Expenditure Account 2007 - 2011.

	2007	2008	2009	2010	2011
	£	£	£	£	£
INCOME					
RESTRICTED FUNDS					
Unrestricted funds transfer	969		140		
Less: Pony herd valuation adjustment			140		
Capital expenditure	-969				
UNRESTRICTED FUNDS					
GRANTS	6,046	13,108	5,413	3,505	
DONATIONS	1,892	2,628	2,250	6,824	3,496
GRAZING REVENUE	8,744	14,726	27,987	19,139	14,994
INTEREST	143	125	7	13	14
SUNDRY	1,318	222	735	667	233
SDJC Volunteers Legacy Balance	1,800				
Restricted funds transfer			-140		
Unrestricted funds transfer	-969				
TOTAL INCOME	18,974	30,809	36,252	30,147	18,737
EXPENDITURE					
FIXED COSTS					
STORE RENTAL	1,519	1,896	1,838	1,905	1,922
WAGES	9,778	10,186	12,030	11,886	13,524
INSURANCE	1,405	919	935	980	1,134
VEHICLE	1,904	2,122	4,119	4,300	5,572
PUBLICITY AND SUBSCRIPTIONS	365	676	653	214	143
ADMINISTRATION	893	720	1,181	1,105	877
PRIOR YEAR ADJUSTMENT		460			-333
TOTAL FIXED COSTS	15,864	16,979	20,756	20,390	22,839
VARIABLE COSTS					
VET MEDS	1,204	95	905	1,333	832
STOCK TRANSPORT	450	833	1,040	717	1,280
GRANT SEED	111	855	715		
FENCING + CONSUMABLES	88	646	304	594	774
OTHER SERVICES			431	445	400
TOTAL VARIABLE COSTS	1,853	2,429	3,395	3,089	3,286
TOTAL EXPENDITURE	17,717	19,408	24,151	23,479	26,125
SURPLUS BEFORE DEPRECIATION	1,257	11,401	12,101	6,668	-7,388
CAPITAL DEPRECEATION	4,471	2,468	1,878	1,408	916
SURPLUS FOR YEAR	-3,214	8,933	10,223	5,260	-8,304

Table 4: SPGCT Balance Sheet 2007 - 2011.

	2007	2008	2009	2010	2011
	£	£	£	£	£
FIXED ASSETS					
VEHICLE AND TRAILER	5,804	4,352	3,264	2,448	1,836
FIELD EQUIPMENT	1,815	1,362	1,021	766	575
OFFICE AND DISPLAY EQUIPMENT	2,250	1,687	1,348	1,012	759
LOGO	1	1	1	0	0
PONY HERD	3,300	5,980	7,450	7,450	7,590
TOTAL	13,170	13,382	13,084	11,676	10,760
CURRENT ASSETS					
DEBTORS	4,440	11,384	2,208	5,227	0
CASH AT BANK AND IN HAND	4,412	8,850	28,524	32,439	30,365
STOCK	160	100	100	100	100
CREDITORS					
DUE IN ONE YEAR	101	22	0	265	685
NET CURRENT ASSETS	8,911	20,312	30,832	37,501	29,780
TOTAL ASSETS	22,081	33,694	43,916	49,177	40,540
RESTRICTED FUNDS	13,170	13,382	13,382	13,382	13,382
UNRESTRICTED FUNDS					
SURPLUS BROUGHT FORWARD	7,654	8,911	20,312	30,535	35,795
SURPLUS FOR YEAR	1,257	11,401	10,222	5,260	-8,304
PREVIOUS YEAR ADJUSTMENT					-333
	22,081	33,694	43,916	49,177	40,540

In interpreting the accounts of Ashdown it is necessary to address the zeros in the Surplus for Year entries and the blank spaces and zeros in the Balance Sheet. These are a result of two issues in the processing of this data, both previously described. Firstly, that these accounts don't actually exist outside of the general account means that some information such as 'creditors', 'debtors' and 'cash at bank and in hand' are not available or calculable. Secondly, the post allocation of HLS funding, means that, in effect, the account is cleared each year and no surplus or deficit accrues. The simplest solution to the problem this poses is to focus on the expenditure of the two schemes as the most useful measure of relative performance. Boxes 3.1 and 3.2 represent an attempt to evaluate the 'real' expenditure data against a 'theoretical' equivalent income based on a standardised HLS area payment, a

set stocking rate and LU equivalents for hill sheep and ponies (Lake *et al*, 2001). As a measure of the accuracy of this method the calculated income figure corresponds approximately with known grazing revenue returned to SPGCT, although the area grazed in reality, across the whole year was 222ha, in contrast to 106ha in the calculation. The ponies were then stocked at a much lower density in reality than that used in the calculation. The sheep in reality grazed an area of 21.7ha for half of the year, as opposed to 52.8ha for a whole year in the calculation so the sheep were stocked at a slightly higher density overall.

Caution is always advised in using prescribed stocking rates in management decisions (Underhill-Day, 2006) but here they have been used only to give a mathematical equivalent.

The results suggest a far greater economy in the operation of the SPGCT, although both arrive at an overall loss. These findings are analysed further in the following discussion section.

BOX 3.1: Ashdown estimated output based on area payments and equivalent LU's (2009-2011 mean).

Calculated HLS revenue @
 $\text{£}200\text{ha}^{-1}\text{yr}^{-1} \times \text{Total LU @ Stocking rate of } 0.5\text{LU ha}^{-1}\text{yr}^{-1}$

= £10,560

minus variable costs: £11,923

Gross margin: -£1,363

minus total costs: £69,815 =

Net margin = £-59,255

Revenue per sheep per month = £3.30

Cost per sheep per month = £22.3

In equivalent LU = £223

BOX 3.2: SPGCT estimated output based on area payments and equivalent LU's (2009-2011 mean).

Calculated HLS revenue @
 $\text{£}200\text{ha}^{-1}\text{yr}^{-1} \times \text{Total LU @ Stocking rate of } 0.5\text{LU ha}^{-1}\text{yr}^{-1}$

= £21,200

minus variable costs: £3,257

Gross margin = £17,943

minus total costs: £24,585

Net margin = £-3,385

Revenue per pony per month = £33.3

Cost per pony per month = £38.7

Discussion

The first point to address in this discussion relates directly to one of the key aims outlined in the introduction, that of hoping to highlight problems in the comparison of such accounts. It is immediately apparent in attempting to make direct comparisons that there are some fundamental difficulties and dangers in doing so and several reasons to exercise caution in drawing conclusions.

From the offset there were some practical difficulties in the handling of the data itself, which have already been described; the different treatment of capital, the two being subject to different rules of accounting and the drawing of Ashdown's accounts from a larger account, all leave the integrity of the data somewhat compromised and present some problems in its interpretation. The example that proved most obstructive was the inconsistency in the assignment of income. HLS payments are the primary source of income for both schemes but they are not awarded proportionately to services rendered (in these examples), with the direct implication that they give an arbitrary measure of the relative 'success' of the two schemes.

These practicalities are ultimately indicative of a more fundamental issue, that of attempting to marry the two seemingly incompatible disciplines of ecology and economics. Many of the problems encountered here relate back to the same unavoidable truth, that conservation grazing schemes are not farm enterprises with monetary returns as their primary goal so assessing them in purely financial terms, emits any measure of their true goals, those of ecological gain. Here we arrive back at the debate described in the introduction as to the efficacy of conservation grazing. How do we judge the success of grazing? Of course there are standardised methods of assessing biodiversity and its practice in conjunction with grazing is well documented (See also Bullock *et al*, 1997, Scimone *et al*, 2007, Newton *et al*, 2009) but with so many other variables to account for, including economics, subjectivity is difficult to avoid. The only attempt to incorporate any ecological element to the comparison here is shown in the final analysis in Boxes 3.1 and 3.2. This example aptly illustrates the complexities of such endeavour. The calculation of area grazed by LU's and a fixed stocking rate, provides an approximate estimate of biomass taken. In the simplest of terms this is the aim of grazing animals for habitat management; net vegetative loss, to which (in the example) we were then able to assign a cost. But here the problems begin because in ecological terms, all is not equal in vegetative loss. Is it the right vegetative loss? At the right rate? At the right time? Is biodiversity increasing? Is the environment being otherwise positively or negatively affected? Depending on the answers to these, and many other possible questions, the resultant 'value' of the service is altered.

A further complicating factor is that the comparison here is not one of like for like, in terms of grazing animal. To reduce analysis to the finances eliminates any consideration of the many and varied influences on the choice of livestock that again may relate to the ecological

objectives of the grazing rather than what is deemed the most profitable option. Breed selection is increasingly considered to play a critical role in achieving desired management outcomes and considerable work has gone into examining the relative effects of behavioural and dietary traits of different breeds (Dumont, 2007). Both breeds in the examples here are commonly utilised in heathland management but Hebrideans have a more proven suitability to the habitat for maximising control of invasive species (Braithwaite, 1997). The use of both provides support for rare breeds. Exmoor ponies are currently classified as endangered, whilst Hebridean sheep, once categorised 'in danger of extinction' are now off the Rare Breeds Survival Trust's 'watchlist', largely due to their role in conservation (Small, 2010).

The extent to which livestock selection affects the results here is dependent on whether it is possible to assign differences in the accounts to the different livestock types. The results certainly show SPGCT to display lower costs for more grazing than Ashdown, but can the simple conclusion be drawn that ponies are cheaper than sheep? There is some evidence that the lower costs may reflect that sheep are a higher maintenance choice of animal. For instance, the greater expenditure in variable costs, including the categories of 'feed', 'replacement stock' and 'dogs', all of which don't apply to SPGCT and fencing and miscellaneous items that greatly exceed those of SPGCT. Miscellaneous costs for Ashdown include items such as registration, shearing, animal disposal and slaughter that again, are costs SPGCT generally don't accrue. Ashdown also have to pay rent for winter lay-by land as the sheep cannot survive on heathland over winter whereas the ponies are either moved to chalk grassland sites or remain on heathland, at a lower stocking density. With regard to fixed costs the far higher wages expense of Ashdown could be attributed to the greater labour requirements of their enterprise. It should be noted here however that SPGCT receive significantly more voluntary labour than Ashdown. Tables 5 and 6 in the Appendix show higher capital expenditure made by Ashdown. These greater infrastructure requirements might also be a result of livestock choice in this case but that assumption would be a simplification. It should be noted that Ashdown's fixed assets, shown in Table 2, are healthier as a consequence of this higher capital expenditure. Equivalent data for SPGCT are shown in Table 4. In terms of breed choice, the use of Hebrideans does reduce the achievable returns on meat because they have smaller conformation and are slower to mature than commercial breeds.

There are several elements in the data that suggest a broader influence on the outcomes for Ashdown, that of the diseconomies of scale. It has already been noted that although Ashdown possess more animals, they in fact equate to fewer grazing units. A hugely limiting factor on the numbers of stock that Ashdown can graze is the fact that permanent fencing is not permitted on the Forest. The reliance on electric fencing and the incumbent extra labour requirements associated with it, must certainly impact on costs, as well as vastly limiting the spread of infrastructure costs across numbers. Also, because Ashdown still need to retain lambs to build flock numbers they are as yet, only showing minimal returns on stock or meat sales. Income in 2011 when sheep and meat were sold shows the potential

income to be gained. Here the relative youth of the project, exacerbated by the spanning of these accounts over two incarnations of the grazing project could have affected the results. This is an area then, where the balance sheet could improve for Ashdown in the future, in the marketing of their products. There are examples of schemes achieving a premium on products due to the 'added value' of the ethical nature of the grazing (Small, 2010), but also much anecdotal evidence that it is a very difficult thing to make happen. This is where the Townings Farm example would have lent an interesting incite because naturally the economics are different for a farm. They operate their own business selling Hebridean and cross-bred lamb, hogget and mutton through their farm shop and at local markets. As well as receiving a headage payment, they will hope to make a return on those animals grazing the heathland at Chailey Common. The results will be interesting.

There is yet another way in which the scale of the Ashdown enterprise might affect the results found here. In the same way that it is considered very difficult for a farmer to attribute fixed costs to a single enterprise on a farm (Nix, 2011), some of their fixed costs, such as the 0.7 multiplier could be an over-estimation of resources actually attributable to the grazing project specifically. Conversely, there are certain advantages to being part of the bigger organisation. Being financed 'in-house' lends a degree of security to the project over that of SPGCT who are effectively reliant on 'customers' to pass on their funding each year. The impact a short loss of revenue had on SPGCT in 2011, illustrates the greater susceptibility of an independent organisation to fluctuations in funding. SPGCT also suffers diseconomies of scale for these reasons. They cannot expand their herd without assurance of sites and, critically, assured payment for each pony, each month.

Returning again to the remit outlined in the introduction. It was an explicit intention not to look for one of these schemes superior to the other. Herein lies a considerable danger in this kind of comparison. It dictates that the two schemes are held-up in relation to one another, out of the context of the wider world. It is then important to impress a broader perspective on the findings. Placed in the wider agricultural context, with subsidies excluded from calculations, it is likely that the majority of livestock farm enterprises would also display negative net margins. (Mills, *et al*, 2007). Negative net margins were also the prediction made by Grayson and Small (2007) in their estimation for the Stiperstones SSSI grazing plan. Using the only benchmark tool available, GAP's 'Ready Reckoner' the variable costs of Ashdown in 2011 were returned at a cost per ewe of £60.31, which falls directly between the medium and high suggested values of £49.17, £72.87 respectively. There is also the question of the alternatives to grazing to be considered. If grazing did not occur on these sites then it is probable that a mechanical form of management would need to be applied instead and that could well be as costly, if not more so (Marrable, 2004).

Almost inevitably, this investigation has raised more questions than it has provided answers. It is only through a similar examination of many more conservation graziers accounts that it will be possible to identify patterns and that way look to real solutions for a sustainable

grazing future. What the results here do suggest, is that rather than this being a search for ways to make conservation grazing pay, it might be more helpful to look for ways for it to cost a bit less. The list of potential considerations to factor into fully assessing the costs and benefits of conservation grazing is long. It could take in socio-political perspectives, historical perspectives, multi-functional landscapes and cultural heritage, 'slow' food, employment, health, tourism and so on. As one of the objectives of this investigation was to incite discussion, it is hoped that putting costs at the centre of the debate as to value of conservation grazing has been proven useful, in bringing to the fore some of the complexities that it is now necessary for scientists and conservationists to consider.

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Appendix

Table 5: Ashdown Forest Capital items 2007-2011.

DATE OF PURCHASE	DESCRIPTION	PRICE £
31/05/2007	Land Rover	7995
22/06/2007	Livestock trailer	4483
22/06/2007	40 sheep hurdles	682
19/10/2007	Rolls of fencing wire	203
13/05/2008	Fencing equipment	413
26/08/2008	Mobile handling system	4060
21/10/2009	ATV	6950
02/02/2010	Small livestock trailer	671
14/06/2010	Land Rover	11,911
02/08/2011	1kl Bowser	537
TOTAL		37,905

Table 6: SPGCT Capital items 2005-2011.

DATE OF PURCHASE	DESCRIPTION	PRICE £
2005	Mitsubishi truck	12,803
2005	Field equipment	1,315
2005	Office equipment/Display	4,352
2005	Logo	400
2006	Field equipment	1,644
2006	Office equipment/Display	2,208
2007	Fencing batteries	336
2007	Display stand and boards	633
2009	Office equipment/Display	110
TOTAL		23,801

SUSSEX PONY GRAZING AND CONSERVATION TRUST NOTES TO THE FINANCIAL STATEMENTS YEAR ENDED 31 DECEMBER 2011.

1 ACCOUNTING POLICIES

Accounting Convention

These financial statements have been prepared under the historic cost convention.

The accounts have been prepared in accordance with applicable accounting standards, the Statement of Recommended Practice, "Accounting and Reporting by Charities", issued in March 2005 and the Companies Act 2006.

Income

Income is recognised when received, invoiced or claimed for grazing contributions and grants which have been approved in principle.

Expenditure

Comprise all costs directly relating to the objects and administration of the Charity.

2 TAXATION

The Trust is not liable to taxation as it holds charitable status.

3 DEBTORS

4 CREDITORS

5 FIXED ASSETS

Depreciation is calculated at 25% under the reducing balance methodology. Logo and display assets unique to the Trust are written down until they reach a nominal amount.

The Trust vehicle is made available to the Grazing Co-ordinator for limited private use the cost of which is reimbursed on terms agreed at suitable intervals.

6 PONY HERD

The initial pony herd was gifted to the Trust and is recorded but not valued in the financial statement. Additions to the herd are valued at cost. Gifts, births, retirements and deaths are determined at the average value of the herd in the financial year or at market value. When market value is used, if required, the estimated total value of the herd is adjusted.

7 TRUSTEE DIRECTORS

None of the Trustee Directors (or any persons connected with them) received any emoluments from the Trust during the year, but four of them were reimbursed a total of £179.52 for travelling expenses; in 2010 two Trustee Directors were reimbursed a total of £56.76.