Glen Prosen – how Scotland's forestry system is turning opportunity into disaster

Description

Fencing to exclude deer and rabbits from sections of the riverbank and protect young trees has been put up in Glen Prosen.

Photo accompanying recent story on the "restoration" of Glen Prosen which appeared in several papers. Note the narrow spacing between the batons designed to make the deer fence visible to birds.

In my last post I argued that the Scottish Government should transfer some of the £53m it has allocated for forestry grants next year to its own agency, Forest and Land Scotland, to reduce deer on its land. What's been happening at Glen Prosen, which FLS bought in Autumn 2022 (see here), provides a good illustration of why that is required but it also show that the Scottish Government needs to reform how FLS' own budget is spent to enable natural regeneration rather than planting.

Recent developments in Glen Prosen

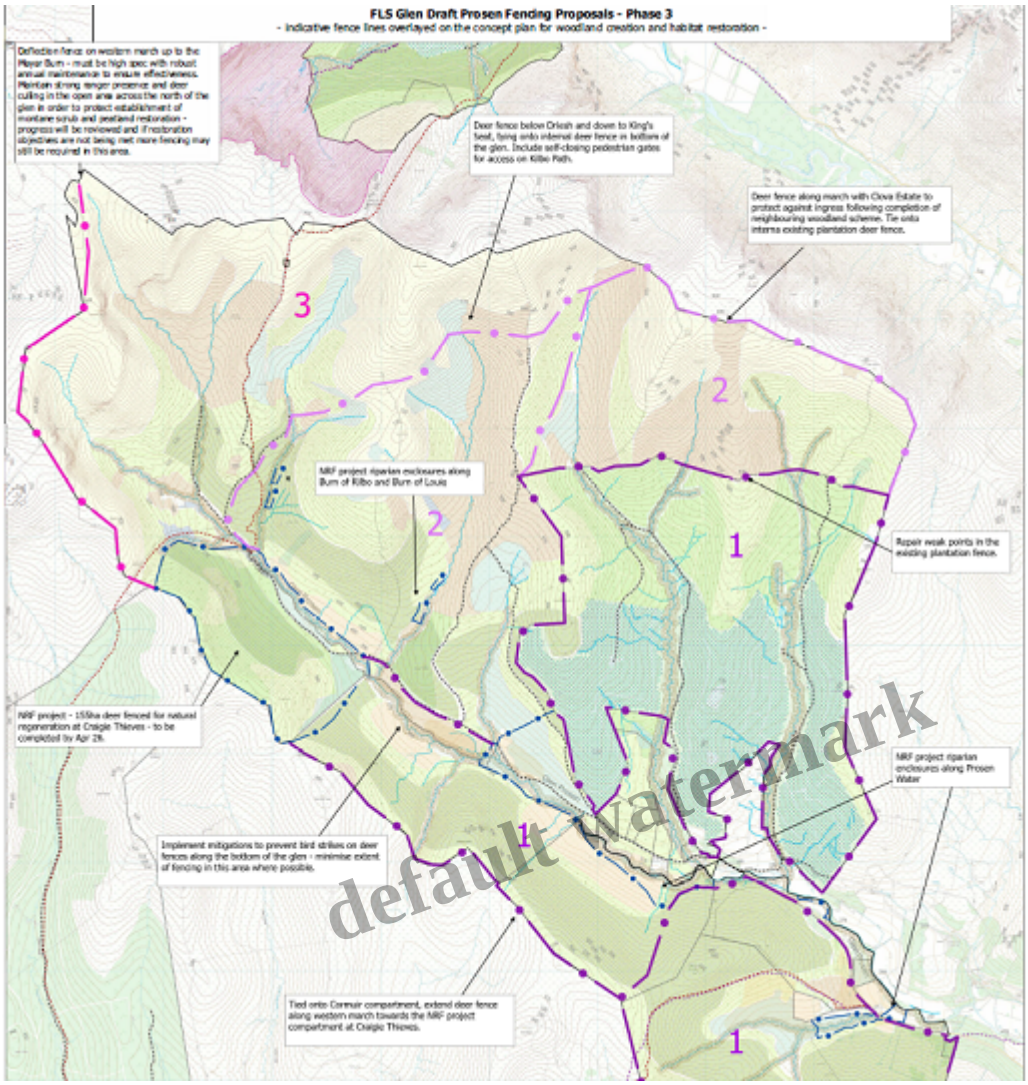
Last month FLS announced the first stage of its plan to restore Glen Prosen was complete (see here). It had erected *"14km of fencing to exclude deer and rabbits from sections of the riverbank to protect young trees".* Instead of FLS financing this work itself, the work was paid for by grant aid from the Scottish Government's Nature Restoration Fund. This is administered by NatureScot and was funded through the River South Esk Catchment Partnership which in April was awarded a £1.4m grant to fund river "restoration" (see here). Having acquired the estate for conservation purposes for £17,555,000 (see here), it appears Scottish Ministers then didn't award FLS any extra money to manage it.

The 14km of fencing protects just 8.7 hectares of planting along the river banks and 155ha of planting/natural regeneration in the former Kilbo plantation which, just five years ago, was surrounded by a sturdy stock fence fence (see here for map).

Former Kilbo Plantation surrounded by stock fence and with trap 2019

All this fencing is a very costly way, from both a financial and carbon perspective, of preventing deer from grazing on a small amount of ground and will result in fences within fences if FLS is allowed to go ahead with its plans.

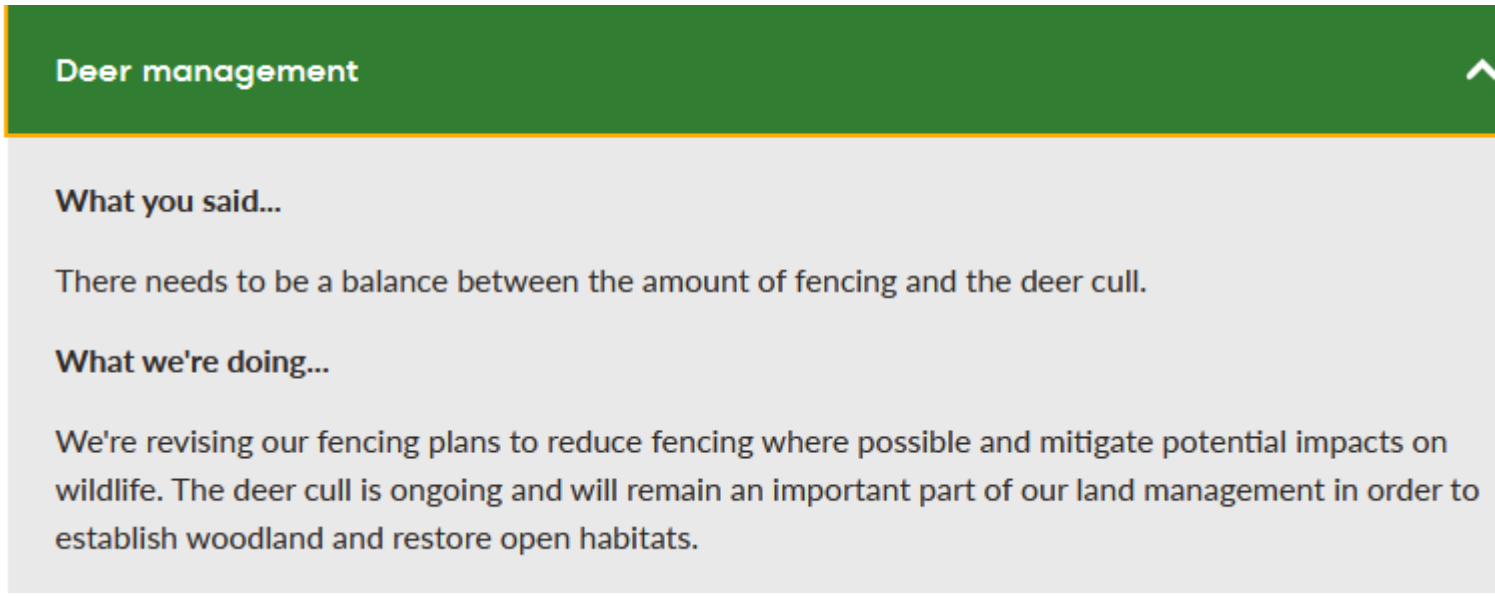
The concept proposals which FLS consulted on in the summer suggested a lot deer fencing and planting instead of reducing deer numbers and allowing the area to rewild naturally (see here):



The pink and purple lines indicate the three “main” phases of FLS fencing with the blue lines along the watercourses representing further enclosures to protect the “riparian” planting.

In the Autumn FLS published a summary of the responses to that consultation (see here) The overall summary stated *“feedback showed broad support for the creation of new native woodland and habitat restoration, and highlighted the need to consider the amount of deer fencing.”*

Unfortunately, this was too late to influence Scottish Ministers, NatureScot and FLS all of whom were involved in the decision to pay for 14km of deer fencing out of the Nature Restoration Fund to protect not very much. FLS has so far not published individual responses to the consultation but had another take on what the public were saying under deer management:



One wonders whether the public were really calling for “balance”, whatever that means, between the deer culling and amount deer fencing or just wanted FLS to reduce deer numbers until nature started to restore itself and do FLS’ job for it.

The new plans for deer fencing have not yet been published but further information is now now about the number of deer FLS has been culling in Glen Prosen and the carbon costs of the deer fencing.

Deer numbers at Glen Prosen

In the summer NatureScot provided me with information about the new voluntary Section 7 Agreement to reduce deer numbers at Caenlochan, which includes part of Glen Prosen (see here).

A survey of the Caenlochan area, undertaken at the beginning of 2022 before FLS bought the property, showed a deer density of 9 per km² at Glen Prosen, below the average of 17.1 deer per km² and below the NatureScot target of 10 deer per km²:

Annex 3: Deer census report March 2022, South Grampian Count Area

Property	Planar Area (ha)	Stags	Hinds	Calves	Total	Density (deer/km²)
Section 7 properties						
ALRICK	1545	258	0	0	258	17
AUCHAVAN	810	30	48	11	89	11
BACHNAGAIRN (BALMORAL)	3401	354	336	91	781	23
CLOVA (south)	1627	62	262	43	367	23
FCS GLENDOLL	702	4	30	8	42	6
GLEN PROSEN	3533	27	246	50	323	9
GLENCALLY (FERGUS & GLENMARKIE)	2075	46	49	16	111	5
GLENHEAD/GLEN DAMFF	2820	67	244	49	360	13
GLENISLA HOUSE	1544	413	409	77	899	58
INVERCAULD (GLENSHEE)	4062	643	258	50	951	23
INVERCAULD GLENCALLATER	6973	376	277	80	733	11
SNH CORRIE FEE NNR	166	8	0	0	8	5
TULCHAN OF GLENISLA	4926	87	716	124	927	19
Total	**34184**	**2375**	**2875**	**599**	**5849**	**17.1**

Extract from Section 7 Agreement. Higher deer density has been reported for Glen Prosen for previous censuses.

The significance of the survey results for individual estates is however limited because deer in the Caenlochan area appear highly mobile, rather than being hefted to the ground, so numbers in particular areas at any one time vary greatly. This mobility on the part of deer makes the allocation of cull targets to individual estates challenging. However, the table below raises some interesting questions with Glen Prosen being asked to cull slightly more deer than Balmoral (Bachnagairn) despite the latter having over twice as many deer (781 compared to 323):

Annex 4 – Draft cull allocation 2023/24

	Property	Hinds	Stags
Zone 1	Alrick	45	42
	Auchavan	24	22
	Glen Cally	61	56
	Glen Isla House	45	42
	Invercauld Glenshee	119	110
	Tulchan of Glenisla	144	133
Zone Total		**438**	**404**

	Property	Hinds	Stags
Zone 2	Balmoral Bachnagairn	93	40
	Clova (South)	39	17
	Corrie Fee	5	2
	Glenhead / Glendamph	77	33
	FLS Glen Prosen	97	42
	FLS Glen Doll	19	8
Zone Total		**330**	**143**

	Property	Hinds	Stags
Zone 3	Invercauld Glencallater	82	103
Zone Total		**82**	**103**

Summary		Hinds	Stags
	Zone 1	438	404
	Zone 2	330	143
	Zone 3	82	103
S7 Total		**850**	**650**

Notes:

1. Based on a recurring model i.e. the same level of cull would be required in 2024/25 and 2025/26 to achieve the target population. Under or over-culling in any year will affect the cull

It looks possible that FLS could be picking up some of the responsibility and a lot of the costs from the Royal Family and other private landowners for culling deer.

The excellent minutes for the South Grampian Deer Management Group (SGDMG) **(see here)** show that this year FLS had culled *"over 160 animals at 20th October, with numbers on their ground apparently coming down now".* That is more than FLS' target, assuming it remained the same as last year, but illustrates the challenge they face: how to prevent deer continually moving into Glen Prosen

and replacing those that have been culled to take advantage of the better browsing that develops as deer density reduces.

The root of this problem has been created by NatureScot agreeing an average deer density of 10 per km² for Caenlochan without reference to scientific evidence (see here). Ten deer per km² is far too high for trees to grow or vegetation to recover from overgrazing as NatureScot has now proved by paying to protect the river banks along the River Prosen from grazing pressure!

Deer fencing

Faced with a similar challenge in Glen Feshie and Tromie of deer crossing over the watershed (mainly from Atholl Estates), Wildland Ltd took the decision that the best way to address the problem was not to fence their boundaries but to cull the incoming deer. FLS, however, are taking the opposite approach and resorting to deer fences, a temporary solution as they never remain deer proof for long. The SGDMG minutes gives an indication of their current plans and timescales:

"FLS updated the meeting on their proposals for Glenprosen, following extensive survey/ evaluation work in 2024. There were 4 X phases to the work, with deer reductions currently in operation to prepare the way for these.

Phase 0 was securing the boundary fencing on the existing forestry block, and initial riparian fencing had already taken place this summer along the Prosen Water, funded by the Nature Restoration Fund. This included an area of regeneration, with the rest to be planted.

Phase 1 was scheduled for spring/ summer 2026, and involved fencing the south side of the estate which would then be planted.

Phase 2 was to fence an extensive area on the north side of the property, as soon as practicable after Phase 1. Phases 0-2 would amount to 3300 ha in total being removed from the deer range.

Phase 3, amounting to c 900 ha, would be largely open, but would include a deer fenced boundary to the west to cut down on deer movement in to that area, which would be managed for open ground habitats, some of which would need low deer densities. Within that area, there would be a number of fenced high altitude enclosures, set up to establish a seed source for future montane woodland. The deflection fence is unlikely to happen before 2027, and is dependent on resource being available. It will include wide deer leaps, potentially 30-40 metres wide, to allow any deer getting caught on the wrong side of the fence to escape."

That is a huge amount of fencing which is being proposed and suggests that FLS have completely ignored the feedback from the public consultation. Part of the reason for this, I believe, lies in their financial and operating model: their staff manage their land remotely, use contractors to do work on the land and have no team on the ground able to monitor the whereabouts of deer and take appropriate action (which is what happens at Wildland Ltd). The hopelessness of this model is revealed in the SGDMG minute which reveals that:

"FLS would be looking to have their own full time employee in the glen to provide continuity of oversight and communications, aided by contract help as required."

Actually, FLS needs far more than that, 2-3 full time equivalent staff based locally as an absolute minimum. However, the current financial model imposed by the Scottish Government prevents that: out of the £27,200,000 tit has provisionally allocated to FLS in 2025/26, a cut of 13.6%, £11,600,000 is for capital (see here). FLS simply don't have sufficient money to commit to recurring expenditure for nature conservation projects. Instead they are forced to plan to install fences as and when capital budgets allow, hence "the deflection fence is unlikely to happen before 2027".

Both Phase I and Phase 2 of the Glen Prosen planting have been registered under the Woodland Carbon Code (WCC) (see here for the registration documentation). For some reason there is no information for Phase 1 but there is for Phase 2 (see map above) which is a mixture of planting and natural regeneration behind fences. The carbon costs of establishing this part of the woodland, as set out in the WCC spreadsheet, are interesting:

Project Basics				
Project start date				31 December 2029
Project duration (years)				100
Total net planting area - excluding open space (ha)				1095.90
Country				Scotland
If in England, Are you using the Woodland Carbon Guarantee?				*N/A*
If using the Woodland Carbon Guarantee, 10-yearly or 5- Yearly verifications?				*N/A*
Emissions from establishment	**spacing (m)**	**area (ha)**	**tCO_2e/ha**	**tCO_2e**
Seedlings	4.0	819.90	-0.01	-8.2
Ground Preparation (Fuel)		819.90	-0.06	-49.2
Tree Shelters		0.00	-0.82	0.0
Fencing		3208.00	-1.64	-5261.1
Herbicide		0.00	-0.001	0.0
Road Building		**km**	**tCO_2e/km**	**tCO_2e**
Roads		0.00	-43.13	0.0
Emissions from removal of trees or other vegetation at the start of the project				
To be calculated separately if any trees or other vegetation is removed prior to planting. Show working on a separate sheet. (See Guidance 3.3 Project Carbon Sequestration)				0.0
Total Emissions from establishment				**-5318.5**
Soil Carbon accumulation (currently only claimable for a site with mineral soil which was previously in arable use, managed with minimum intervention)				**area (ha)**
If previously arable site on mineral soil: Over what area are you claiming Soil C Sequestration (ha)				0.00
Baseline and Leakage				**Yes or No**
Baseline: Will your project area sequester a significant amount without planting trees? (See Guidance 3.1) If yes, ask the WCC team for further assistance				No
Leakage: Will your project cause significant emissions outside the project area? (See Guidance 3.2) If yes, ask the WCC team for further assistance				No

Project Name:	Glen Prosen Phase 2
Calculation Completed by:	N. Hutson

Almost 99% of the Carbon Dioxide emissions caused by the initial planting, 5261.1 out of a total of 5318.5 tonnes, is caused by the deer fencing! One wonders whether Mairi Gougeon, the Minister responsible, who has rightly defended (see here) the Glen Prosen purchase on conservation grounds, which include the

contribution it could make to net zero and tackling climate change, is aware of this?

Those establishment emissions, however, are less than half the amount that the 12,987 tCO2 it is calculated will be lost from the soil in Glen Prosen due to the planting methods:

Summary Carbon Sequestration over time

Cumulative to Year	A: Cumulative Carbon Sequestrn from lookup tables (tCO_2e)	B = 80% of A: Cumulative Carbon Sequestrn Less 20% model precision (tCO_2e)	C: Negative Removal of vegtn and/or Establishment Emissions (tCO_2e)	D: Cumulative Soil Carbon (loss in year 1 and cumulative accumuln if relevant) (tCO_2e)	E= B+C+D: Total Project Carbon Sequestration (tCO_2e)	F: Baseline (tCO_2e) - Normally Zero - No change over time	G: Leakage (tCO_2e) [Emissions are negative] - Normally Zero - No change over time	H=E+F-G Net Project Carbon Sequestration adjusted for Baseline and Leakage	I=15- 20% of H 20% Contribution to buffer (tCO_2e)	J=H-I Claimable Carbon Sequestration (tCO_2e)	K=J/Net Area Average total claimable sequestration per hectare by year x (tCO_2e - el
5	596	477	-5319	-12987	-17829	0	0	-17829	-3566	-14263	-17
10	2932	2345	-5319	-12987	-15960	0	0	-15960	-3192	-12768	-42
15	10236	8189	-5319	-12987	-10117	0	0	-10117	-2023	-8094	-7
20	23419	18735	-5319	-12987	430	0	0	430	86	344	0
25	36006	28805	-5319	-12987	10499	0	0	10499	2100	8399	8
30	46906	37525	-5319	-12987	19219	0	0	19219	3844	15375	14
35	55243	44194	-5319	-12987	25889	0	0	25889	5178	20711	19
40	61354	49083	-5319	-12987	30778	0	0	30778	6156	24622	22
45	66372	53097	-5319	-12987	34792	0	0	34792	6958	27834	25
50	71413	57130	-5319	-12987	38825	0	0	38825	7765	31060	28
55	74477	59581	-5319	-12987	41276	0	0	41276	8255	33021	30
60	76872	61497	-5319	-12987	43192	0	0	43192	8638	34554	32
65	78891	63113	-5319	-12987	44807	0	0	44807	8961	35846	33
70	80266	64213	-5319	-12987	45907	0	0	45907	9181	36726	34
75	81643	65314	-5319	-12987	47008	0	0	47008	9402	37606	34
80	82882	66306	-5319	-12987	48000	0	0	48000	9600	38400	35
85	83998	67198	-5319	-12987	48892	0	0	48892	9778	39114	36
90	85013	68010	-5319	-12987	49704	0	0	49704	9941	39763	36
95	86917	69534	-5319	-12987	51228	0	0	51228	10246	40982	37
100	87523	70019	-5319	-12987	51713	0	0	51713	10343	41370	38

These recorded soil carbon emissions are an underestimate compared to those found by research, as I showed again recently for Stobo Hope (see here), and are likely to continue for years, not stop at year 1-5 as per the table above. But what is also highly significant in respect of the future management of Glen Prosen is how those emissions are caused:

Assumptions - Soil Carbon Emissions - Table 3. Input the previous landuse, soil type and site prep type . Use one line for each soil type/ s

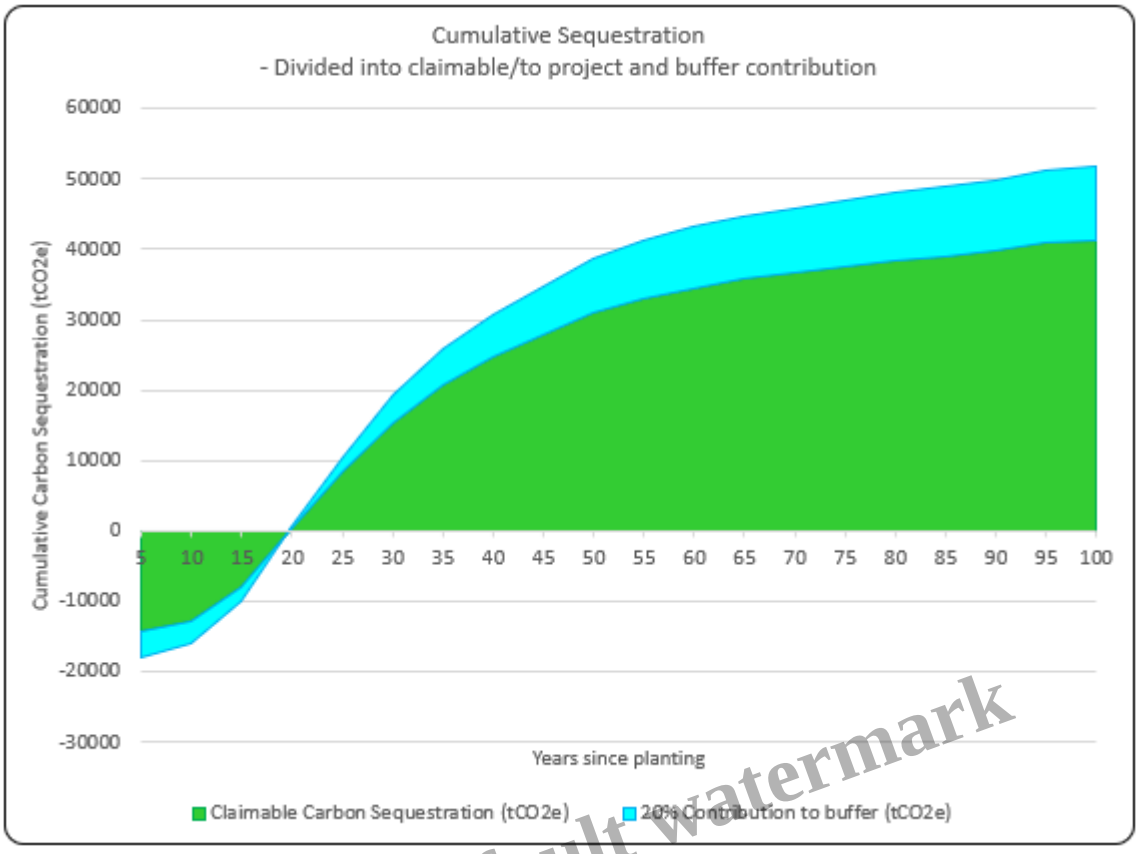
Previous Landuse	Soil Type	Disturbance/ Site Preparation	Area (ha)	% Soil Carbon Lost	Soil C Emissions (tCO2e/ha)	E (tC
Seminatural	Organomineral	Low disturbance: Hand turfing, inverted, hinge & trench mounding, patch scarification, subsoiling, drains	442.75	05	-29.3	
Seminatural	Mineral	Low disturbance: Hand turfing, inverted, hinge & trench mounding, patch scarification, subsoiling, drains	295.16	00	0.0	
Seminatural	Organomineral	Negligible Disturbance: Hand screefing only	49.19	00	0.0	
Seminatural	Mineral	Negligible Disturbance: Hand screefing only	32.80	00	0.0	
Seminatural	Mineral	None	276.00	00	0.0	
Please select	Please select	Please select	0.00	0	0.0	
		Total	**1095.90**			

**** Check total area here is at least the net area planted above**

The assumption in the second line that no carbon is released from mineral soils, as opposed to the c soils in the first line, is highly questionable as mineral soils also have organic carbon content.

The WCC calculator assumes there will be no emissions caused by hand screefing, where vegetation is cleared by hand and the tree planted into a slot created by a spade. Unfortunately, those areas in Glen Prosen are much more limited than the areas where mounding etc is proposed on carbon soils, hence the large carbon release from soil disturbance in the first line.

The conclusion from a WCC carbon offsetting perspective is that if FLS culled deer instead of erecting deer fences and used only screefing to plant trees, Glen Prosen would start absorbing carbon immediately instead of emitting it for the next 20 years:



Unfortunately, while this makes complete sense from a WCC perspective, it doesn't take account of the impact that ongoing respiration processes caused by trees have on the carbon in soils. The research by Friggens et al found the carbon trees release from organic soils outweighs the carbon absorbed from the atmosphere by trees like birch for at least 39 years. The WCC graph for Glen Prosen, using the methodology developed by Scottish Forestry, which suggests the benefit of planting will surpass the negatives in 20 years time is therefore seriously wrong.

This fact does not mean the answer is for FLS to stop trying to enable trees to grown in Glen Prosen and uproot natural regeneration wherever it occurs. What is shows, however, is that the drive to promote tree planting as a means of offsetting carbon emissions is seriously flawed. It means that if we are serious about both the need to reduce carbon emissions and to reverse the decline in nature, we should not be upending soils, allowing them to leach carbon into the atmophere or protecting the trees by carbon guzzling deer fencing. Instead, we should be focussing on reducing grazing pressure and allowing natural regeneration to do the rest.

While the native trees that then get established without any direct human help will start to release carbon from the soils, this will be a far more gradual process than what is happening at present where forestry planting is pump priming the atmosphere with CO2 created from the carbon it is releasing from soils. This gradual process will also be offset to an extent by the growth of vegetation other than trees through natural regeneration and by enabling areas of shallow peat to develop and start to realise their potential as a carbon store.

How to unlock Forest and Land Scotland from the system in which it is trapped?

The same forestry business model which drives the Forestry Grants System also drives Forest and Land Scotland. The basic assumptions behind this model, which helps explain why forestry in Scotland is so different to most forestry in mainland Europe, are that private sporting estates have a right to manage land as they wish and high deer numbers are a given and that timber should be grown as quickly as possibly (a legacy of the creation of the Forestry Commission after the First World War). The consequence is that instead of culling deer (which would enable continuous cover forestry as practised on the continent) plantations of trees are grown behind deer fences.

Instead of reviewing this model as environmental awareness has increased over the last fifty years what has happened is that successive governments have tried first to apply it to the "restoration" of nature – attempts to modify the forestry grants system to enable native pinewoods to recover go back to the 1980s – and now more recently to help offset our carbon emissions. Commercial vested interests in the forest industry have been delighted with this, as it helps justify what they do, while the attempt to create a carbon market through the Woodland Carbon Code has created new opportunities for financial speculation.

That attempt to create a carbon market, however, is likely to collapse sooner rather than later due to its internal contradictions, including the fact that the way trees are planted under the current forestry model appears to cause rather than mitigate carbon emissions.

At one time there were signs that the adoption of wider objectives by the then Forestry Commission might enable it to escape this forestry business model, including the focus that was given to outdoor recreation as a result of public pressure. As FLS' budgets have been cut, however, it has retreated from these alternatives objectives (hence the failure to maintain basic recreational infrastructure (see here)) back into the failed business model.

Hence its proposals for Glen Prosen, plant and fence rather than employ local foresters to control incursions of red deer from neighbouring sporting estates. Then under pressure from the Scottish Government to create local jobs without the budget to do so, it has outsourced that task to others, hence the gin bothy in Glen Prosen announced (see here) not long after the new NatureScot funded deer fence was completed.

There are staff within FLS who know this is all wrong but without support from other public authorities have no chance of doing anything differently, despite the stated objective of managing places like Gen Prosen for nature.

Diverting say £2m from the Scottish Forestry's grants budget to enable FLS to employ local staff in Glen Prosen and in other areas supposedly being managed for conservation, like Glenmore and the Great Trossachs Forest, would enable the land to be managed in a different way. Instead of calling for this, NatureScot just accept the basic assumptions of the forestry business model and applied it to native woodland. Hence why they have grant-aided the new deer fences instead of supporting FLS to reduce deer numbers to sustainable levels.

The Cairngorms National Park Authority, which was set up to make a difference, has once again at Glen Prosen shown itself incapable of making a difference. The fact it too no longer has any locally based staff doesn't help. The fundamental problem, however, is that it is still wedded to the same failed forestry business model of planting and fencing rather than reducing deer numbers. Having done nothing to stop the publicly funded private sector planting disasters at Muckrach, BrewDog's Lost Forest and Far Ralia from going ahead, it says something that it is not even prepared to call publicly on FLS to do the right thing at Glen Prosen.

There should be no new National Parks in Scotland until the reasons for the failures of the two existing ones have been properly reviewed.

Category

1. Cairngorms

Tags

1. carbon emissions
2. conservation
3. Deer
4. FLS
5. forestry
6. NatureScot
7. scottish forestry
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