

Castle Milk & Corrie Estates, Lockerbie, Scotland

Introduction

Castle Milk & Corrie Estates is a long established traditional Scottish country Estate. It belongs to Sir John Buchanan-Jardine and his family who live at Castle Milk.

The original Castle Milk Estate was established by the Bruce's of Annandale, mentioned in Glasgow chartulery records as far back as 1179. Following the Wars of Independence it was held by the Stewart family. They sold the Estate in 1579 to Lord Maxwell, and owning another Estate near Glasgow they changed its name to Castlemilk – this was to become the famous Glasgow housing scheme of today.

The Estate merged with neighbouring Estates over the centuries and now covers approximately 10,000 Hectares with three hamlets within its boundary, several Churches, 50 farms and around 300 houses.

There are 2,085 hectares of forest land (85% productive), on the Estate managed by a full time Forestry Department with a Head forester and six Woodsmen. The Department manages the forest and does all the re-planting, spraying for weevil, weeding, scrub cutting, road repairs, minor thinnings and small amount of sawmilling. We hire in contractors with harvesters and forwarders to do our felling and timber haulage, as well as selling some parcels directly to merchants as Standing Sales. We cut approx. 15,000 tonnes a year from a usual sustainable annual cut of 40 hectares.

As you can see from the table the Estates forestry is mainly Sitka Spruce. After excavator back-filled trench mounding and v-bucket draining, we are currently planting mainly Sitka in the higher ground but planting some other species on the better, lower ground, at 6 feet spacing. We source the vast majority of our trees from Maelor nurseries in Wales and are pleased with their establishment and growth rates.

Species	%	ha	Age	%	Hectares
Sitka Spruce	53	1109	2011-2020	19	397
Sitka / Pine mix	15	315	2001-2010	30	623
Norway Spruce	5	113	1991-2000	12	248
Hardwoods	5	112	1981-1990	11	229
Larches	2	41	1971-1980	8	141
Scots Pine	3	58	1961-1970	11	131
Open Ground	3	66	1951-1960	4	72
Douglas Fir	4	93	1941-1950	3	47
Felled	<1	3	1931-1940	<1	6
Others	5	100	<1930	4	84

History of Forestry at Castle Milk

There has been a Forestry Department at Castle Milk for over a hundred years with records going back to the 1920's. At one time there was 100 men employed in the forests on the Estate with a Head Forester and three assistant Foresters with a full-time Sawmill. There was heavy felling of forests during WW1 and many of the hardwood woodlands appear to have been planted with conifers during this period.

In WW2 again there was heavy felling on the Estate with whole forests being clearfelled. This was done by Commonwealth forestry teams from Sierra Leone and Australia. They had a cricket tournament at the Castle against an Estate Scotland team. Not sure who won! Much of the replanting was with Scots Pine sourced from Estates in Moray, of superior quality.

In the 1950's and 60's management continued with regular felling and replanting. Shelter belts and small woods were usually expanded onto poorer agricultural land when replanted. Several species were used at this time including the traditional "Gentleman's mix" of Larch, Norway Spruce and Scots Pine. Larch (increasingly Hybrid) was planted on the best ground, Norway Spruce in frosty areas and Scots Pine in heathery sites. Sitka Spruce was also heavily used in this period.

In the late 60's and 70's there was a massive expansion of the forest area with 600 hectares of new planting at Whitcastles farm. This is now part of the Eskdalemuir forest complex. New drainage techniques along with heavy government tax relief made this a viable proposition. This forest is now our main production area being 40 years old.

In the 80's and 90's economics meant thinnings were difficult so much Sitka Spruce/Scots Pine was planted as a self-thinning mixture with mixed results. The Estate was among the first in the private sector to plant Improved Sitka Spruce from Elite cuttings. Generally the Estate has always been very pleased with Sitka Spruce and has planted a lot of it.

There was a heavy windblow following the boxing day gales of 1998 where several hundred hectares were badly affected. This began a large harvesting programme in the early 00's with restocking primarily with Sitka Spruce.

Over the last 10 years we have been felling a lot of our older stands especially Larch due to the Phyophthora ramorum outbreak. Generally we have replanted our Larch woods with Douglas Fir as we expect a source of redwood will still be needed in the future. Because of the threat of disease and that we should not put all our eggs in one basket, we have experimented with other species such as Norway Spruce, Western Hemlock, Noble Fir and Grand Fir along with some others on various sites.

Experiments

All the experiments below are in the 200ha Birkshaw forest, our second biggest. This was a heathery moor with small plantation until the 1930's when much of it was planted up. It has brown earth soils along with peaty top soils with sandy sub-soils and, some of it is surprisingly wet until you drain it, with grey running sand. Worse areas have wet clay soils. Originally much of this area was planted with Pine and Larch due to the heather competition which doesn't bother these species. Although we can't visit these sites virtually they are all close to Lockerbie if people are interested. Most of the plots are due to be remeasured.

Stop 1 – P1987 *Picea sitchensis* Elite Sitka Spruce vs standard Queen Charlotte Island Sitka

The Estate has always done a lot of experimentation in forestry and was, along with Buccleuch, one of the first private Estates to experiment with Improved "Elite" Sitka spruce. This experiment was set-up to test the different performance of the early Elite tree cuttings against the then standard (to mid-late 90's anyway) QCI Sitka. This was planted in the usual at that time Sitka/Scots Pine 50/50 mix. The Elite tree rows are obvious once you see them.

Measure Date	Seed Source	Ground Conditions	Ave Height m	Diff m	Diff %	Ave YC	Ave Volume per Ha	Ave DBH cm	Ave tree	Total Volume per Ha
17/03/1993	Elite	Poor	1.8	0.39			1.08			12.75
	QCI	Poor	1.41							10.38
05/03/1996	Elite	Poor	3.65	0.72			0.72			11.12
	QCI	Poor	2.93							9.75
02/09/2002	Elite	Poor	11.1	1.35		24	61.17	15.35	0.097	81.15
	QCI	Poor	9.75			22	19.98	13	0.061	
07/11/2007	Elite	Poor	14.3	1.90		24+	131.69	18	0.184	188.74
	QCI	Poor	12.4			22	57.06	13	0.083	
02/11/2009	Elite	Poor	14.4	1.80		24+	145.12	20	0.212	221.31
	QCI	Poor	12.6			22	76.19	14	0.089	
29/08/2016	Elite	Poor	22.1	1.40		26	331.65	26	0.53	501.14
	QCI	Poor	20.7			22	169.49	19	0.26	

Stop 2 – P2015 *Pseudotsuga menziesii* Improved French Douglas Fir vs American Douglas

Here we have planted some Improved Douglas Fir from France – 1u1 La Luzette seed orchard vs our standard 1u1 Douglas Fir NW Cascades all available from Maelor. The La Luzette French material is growing faster it will be interesting to compare the form as the stand develops.

Tables for Stops 2&3

Compartment	C22		C22		C22		C22
P2015 Measure 30/8/16	DF 1u1 French s/o		DF 1u1 NW Casc		Tamarack		Cryptomeria Japonica
Average Height	0.67		0.56		0.95		0.30
Range	0.91		0.83		1.61		0.44
Variance	0.04		0.02		0.08		0.01
Tallest	1.20		0.95		1.77		0.55
Shortest	0.29		0.12		0.16		0.11
Median	0.66		0.57		0.99		0.29
Standard Deviation	0.19		0.14		0.29		0.08

Compartment	C22		C22		C22		C22
P2015 Measure Spring 2018	DF 1u1 French s/o		DF 1u1 NW Casc		Tamarack		Cryptomeria Japonica
Average Height	1.03		0.83		1.68		0.51
Range	1.52		1.57		2.00		1.08
Variance	0.12		0.09		0.16		0.05
Tallest	1.93		1.83		2.74		1.24
Shortest	0.41		0.26		0.74		0.16
Median	1.03		0.8		1.72		0.47
Standard Deviation	0.35		0.30		0.40		0.22

Stop 3 – P2015 *Larix laricina* Tamarack and *Cryptomeria japonica* trial

Phytophthora ramorum has become a major killer of Larch in SW Scotland. When *P ramorum* started to be found in England and Wales we decided it would be a good idea to start felling our Larch before we got the disease. Many of our older plantations of Larch of the 1930's-50's have now been felled and mainly restocked with Douglas Fir which we hope will be a comparable redwood for fencing and other uses.

We read some research from the United States that suggested Tamarack, *Larix laricina*, might have some resistance to the disease which killed all the other trees during the trial but not the Tamarack. Maelor Forest nurseries kindly sourced seed for us and we have planted a few small areas like this to see what happens. It is growing faster than we expected.

Cryptomeria japonica has been sourced from Christies Elite nursery as a trial alternative species.

Stop 4 – P2000 *Picea sitchensis* M00 trials

In 2000 this interesting experiment was set-up by retired Castle Milk foresters Roy Carlaw and Andy Currie to compare different sizes of Sitka Spruce from different sources – some Improved cuttings (the M00 series), some Improved Seed Orchard (A13). The results are interesting and are for general discussion. They are in alternate rows of half a dozen individuals in three replicates.

Plant Trials				Compartment 24				Planted May 2000				
Seed Source	Plant Type	Plant Age	Ave Height at Planting cm	After 1st Year				After 2nd Year (15.9.01)				
				Ave Height cm	Increment cm	Rank	% inc of original height	Ave Height cm	Increment cm	Rank	% inc of original height	
M0014	C 1+2	3	48.5	54.4	5.9	1	12	70	15.6	5	32	
M0044	C 1+1	2	32.9	46.1	13.2	2	40	102	55.9	1	170	
A13	2+1	3	32.6	44.4	11.8	3	36	95	50.6	2	155	
M0014	C 1+2	3	28.9	36.6	7.7	4	27	67	30.4	6	105	
M0044	C 1+1	2	26.2	35.8	9.6	5	37	84	48.2	3	184	
A13	1+1	2	21.3	33.5	12.2	6	57	77.5	44	4	207	
Seed Source	Plant Type	After 5th Year (04.05)		After 9th year (2/11/0)		After 16th year (31/8/16)						
		Ave Height cm	Rank	% inc of orig height	Av DBH cm	Rank	Av DBH cm	Rank	DBH	Increase	Thick	Thin
M0014	C 1+2	231	6	476	10.64	3	16	4	5.06	23	7	16
M0044	C 1+1	293	1	891	10.85	2	17	2	6.15	23	11	12
A13	2+1	267	2	819	11.67	1	18	1	6.43	23	12	11
M0014	C 1+2	247	4	855	10.50	5	16	5	5.10	21	11	10
M0044	C 1+1	244	5	931	10.57	4	16	3	5.83	28	12	16
A13	1+1	259	3	1216	9.75	6	15	6	5.65	19	9	10

Yield Class - well off the Scale!

Stop 5 – 2013 *Picea abies* Improved Norway Spruce trials & P1959 Oak stand

We have been re-stocking with Norway Spruce since about 2010 mainly a handful of sites that had good Norway previously. This has generally been with Latvian sourced material if we could get it. We find that our Norway is slow to establish but can take off after about 6-7 years and grow very quickly. Norway is without doubt our straightest tree and gives 50-60% Green Logs versus Sitka usually 30-40%+. We had a visit from SODRA and Maelor were able to source some of their Improved Norway Spruce 2+1 25-50cm from Runesten qualified Seed Orchard in Southern Sweden. This is from same latitude as the Cairngorms. We planted it on three sites – south (this one), middle and north various degrees of harshness and compared it with likely alternatives at these sites – our usual Douglas Fir 1u1 NW Cascades American and A13 1+1 seed orchard Sitka. There was heavy deer damage in the Northern site but we can see how well the improved Norway is doing – it grows fast and is even beating the Douglas here.

P2013 Measure 31/8/16	Super Norway Spruce	NS 2+1 s/o			Competitor: DF 1u1 NWC	DF 1u1 NWC	SS 1+1 A13	Grand Fir 2+1 washtn
Compartment	C24	C96	C262		C24	C96	C262	C262
	South	Mid	North		South:DF	Mid:DF	North:SS	North:GF
Average Height	1.58	1.13	0.55		1.49	0.91	1.21	0.62
Range	2.25	1.49	0.84		1.96	1.66	2.09	1.40
Variance	0.11	0.12	0.03		0.20	0.10	0.16	0.06
Tallest	2.75	1.89	1.10		2.40	1.68	2.20	1.53
Shortest	0.50	0.40	0.26		0.44	0.02	0.11	0.13
Median	1.60	1.10	0.52		1.50	0.89	1.20	0.60
Standard Deviation	0.33	0.34	0.19		0.45	0.31	0.40	0.24

P2013 Measure 18/4/18	Super Norway Spruce	NS 2+1 s/o			Competitor: DF 1u1 NWC	DF 1u1 NWC	SS 1+1 A13	Grand Fir 2+1 washtn
Compartment	C24	C96	C262		C24	C96	C262	C262
	South	Mid	North		South:DF	Mid: DF	North: SS	North: GF
Average Height	2.21	1.70	0.79		2.09	1.58	1.86	0.87
Range	2.35	2.41	1.35		2.76	2.41	2.30	1.64
Variance	0.22	0.26	0.07		0.44	0.22	0.20	0.13
Tallest	3.25	2.89	1.65		3.42	2.85	3.08	1.82
Shortest	0.9	0.48	0.30		0.66	0.44	0.78	0.18
Median	2.3	1.74	0.78		1.96	1.60	1.81	0.84
Standard Deviation	0.47	0.51	0.27		0.67	0.47	0.45	0.36

The Oak behind the Improved Norway Spruce is P1959 Sessile Oak (*Quercus petraea*) which was grown in the old Estate nursery from acorns collected from the Berce region of France by the previous Laird Sir Rupert.

We retained this stand after felling the surrounding P1959 Larch.

Visit Stopping Points

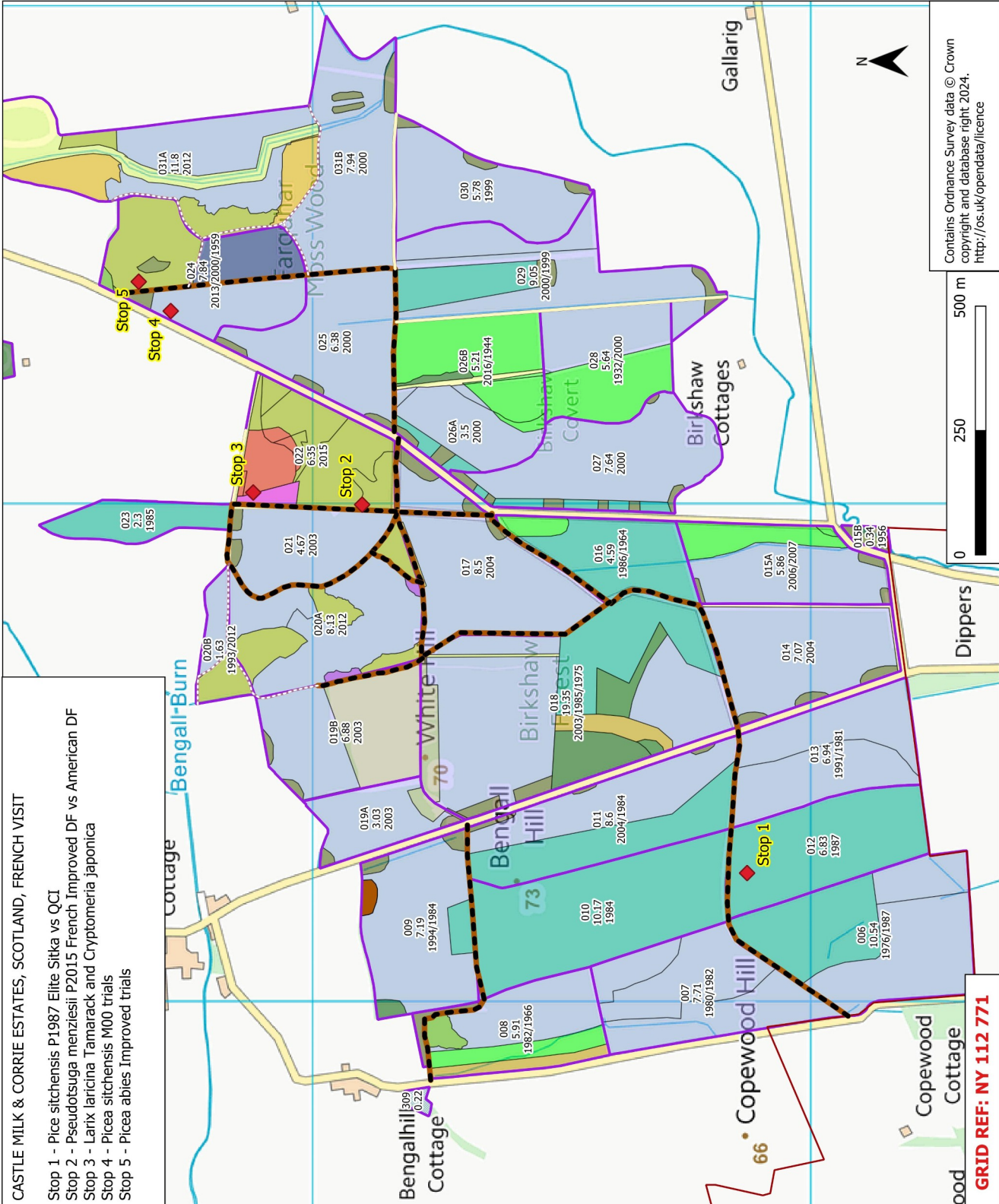
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- Forest Road
- Track
- Estate Tar Road
- Path
- Gas Pipeline
- Estate Boundary
- Compartment Boundaries

Stock Map

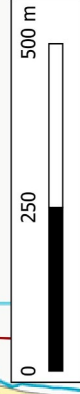
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- JL
- DF
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- FELLED
- SS/SP
- OG
- HL
- SS/NS
- LP
- MC
- OK
- SY
- GF
- WH
- NF
- OL
- AR
- MC
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- BE
- EL
- WRC
- MP
- DF/JL
- SS/LP
- SS/SP/MB
- JRC
- TK
- DF/WH
- SS/DF

CASTLE MILK & CORRIE ESTATES, SCOTLAND, FRENCH VISIT

- Stop 1 - Picea sitchensis P1987 Elite Sitka vs QCI
- Stop 2 - Pseudotsuga menziesii P2015 French Improved DF vs American DF
- Stop 3 - Larix laricina Tamarack and Cryptomeria japonica
- Stop 4 - Picea sitchensis M00 trials
- Stop 5 - Picea abies Improved trials



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