

KIRKHILL FOREST HISTORY

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HISTORY OF KIRKHILL FOREST

COMMENTS BY STATE FORESTS CONSERVATOR

Choice of Species

Race of Douglas fir is adduced as the reason for coarse growth rather than faulty choice of site. Conservator (East) in his comments suggests that lack of partial shading and "normal" spacing are the causes of roughness. Is there not some record of "swinging" in the earlier Douglas fir plantings which, together with losses through vermin, weed-growth, etc., has led to an unusual unevenness in the early years of the plantations? Under such circumstances many of the trees that got away would be bound to be rough.

General

It may be the case that Kirkhill now presents few silvicultural problems of real difficulty, but the picture must have been different in the 1920's. It may be fair to suggest that the difficulties of those who did not have the advantages of tractor ploughing of moorland which started on a small scale in Scotland in 1935 tend to be minimised by the advances in technique and removal of difficulties in the past 10 to 15 years.

It is to be hoped that optimism about Sitka spruce on drier sites will be justified; the solution of establishment problems is evident, but the continuation of satisfactory growth and timber production on dry sites in low rainfall areas is still to be proved.

A. Watt.

18th October, 1951.

COMMENTS BY STATE FORESTS OFFICER AND CONSERVATOR

Kirkhill is a forest of which we are not proud. It presents few silvicultural problems of real difficulty, yet it has one of the worst records in the Conservancy of beating-up and weeding. Since the lesson of fencing is now well learned, Kirkhill inspires more philosophical than silvicultural thoughts.

As at Forest of Deer which is in a similar climatic zone, Sitka spruce is promising well on other than flush sites, and in spite of the low rainfall. Since Sitka stands exposure so well, and since we are now confident of starting it wherever we can take the plough, it obviously is in spite of the pessimist, one of our most useful trees. Once again too, Kirkhill shows that the choice of race of Scots pine for exposed sites is of the greatest importance and this subject is now receiving the attention it deserves at seed collection and plant allocation times.

(Sgd.) T. H. WOOLRIDGE,

State Forest Officer.

In spite of its unsatisfactory beating up record, Kirkhill will be a reasonably good coniferous forest, when thinnings have had time to improve the plantations. The forest shows some points of general interest, among which are:-

- (1) Scots pine of suitable strain can be used with success, particularly where there is local shelter from the east (See Compartment 58 - P.47 etc.).
- (2) In Kirkhill conditions, Douglas fir at normal spacing produces a very rough crop. Its use is undesirable except where a measure of side shade in youth can be provided.
- (3) The mixtures of Pinus contorta/Norway spruce; Pinus contorta/Sitka spruce; Scots pine/Norway spruce are particularly valuable for demonstration of pine/spruce mixtures at a fairly advanced stage (Compartment 40 P.29).

(Sgd.) F. OLIVER,
Conservator.

4.10.51.

GENERAL DESCRIPTION OF THE FOREST

Situation

The forest got its name from the first acquisition which formed part of Kirkhill Estate.

There are now three main blocks in the forest.

- (1) Kirkhill and Caskieben which lie on the north and south (Kirkhill only) side of the main Aberdeen - Inverurie road seven miles from Aberdeen.
- (2) Parkhill consisting of three separate blocks of woodland about $1\frac{1}{2}$ miles from Parkhill Station on the Aberdeen - Old Machar road.
- (3) Glascoego sections lying 1 to $1\frac{1}{2}$ miles from the village of Blackburn about nine miles from Aberdeen.

All land acquired was either woodland or felled woodland except for certain small farms and crofts most of which are now transferred to the Department of Agriculture for Scotland for management.

Part of East Woodlands, a gift acquisition, was agricultural land which has been largely afforested before being gifted. 6 acres is now a nursery while the remainder of the unplanted land is let annually as grazing under Forestry Commission management. East Woodlands House, which was included in the gift, is occupied by the Conservator.

An acquisition pending from Fintray Estate will connect the Kirkhill, Caskieben and East Woodlands areas.

Area and Utilisation

The land utilisation of the various acquisitions forming the forest is shown in Table I.

TABLE I

From	By	Date	Plantations Acquired	Plantable (exc. Col. 4)	Nurseries	Agricultural	F. W. H.	Unplantable (exc. Col. 4)	Other Land		Total
									Descrip- tion.	Acres	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Countess of Southesk	Feu	1921	159	328							487
John & Chas. Gordon.	(Feu (Purchase	1923 1930		154							154
Miss A. Dalrymple	Purchase	1926	20	79							99
P. B. Wemyss etc.	"	1927	-	26							26
Countess of Southesk	"	1929		887			4				4
John Gordon	"	1944		23.5							23.5
Mrs. E. Stephen or Wilson	"	1945	27	563		102		5			697
Wm. Hay	Gift	1946	37			10		2			49
Trustees of Mrs. E. Stephen or Wilson	Feu	1949						1.3			1.3
Totals:			243	1173.5		112	4	8.3			1540.8

TABLE II

(a) <u>Plantations</u> -			
Acquired		51	
Formed by Commission		<u>1236.5</u>	1287.5 acres
(b) <u>In hand, awaiting planting</u> -			
Blanks after felling		112	
Burnt Areas		1	
Other land		<u>-</u>	113 acres
(c) <u>Nurseries</u>			6.3 acres
(d) <u>Agricultural</u> tenancies (D.O.A.S.)			
		118.9	
	 tenancies (F.C.)	<u>4.4</u>	123.3 acres
(e) <u>F.W.H.</u> 1 tenancy			3.7 acres
(f) <u>Unplantable land in hand</u>			2.2 acres
(g) <u>Other land</u> - houses, gardens etc.			<u>4.8</u> acres
Total			<u>1540.8</u> acres

The Caskieben acquisition was all let to graziers mainly as seasonal grazings. They have all been resumed and entry secured with one exception - a rough grazing amounting to 33 acres on a year to year tenancy. This is to be planted F.Y.52. Entry will be obtained at March, 1951.

All land in hand will be planted by 30.9.52. The Fintray acquisition of 92 acres will be planted in F.Y.53 if entry is obtained in time.

Physiography

The main block consisting of Kirkhill and Caskieben rises from south-east and north-east from 400 ft. in the east to 800 ft. at the summit of Tyrebagger Hill, from which the following Forestry Commission forests can be seen:-

Kenmay
Midmar
Tilliefoure
Pitfichie
and Corrennie

The ground is cut by shallow valleys running east and west. The slope is gradual and the exposure mainly from south-east and south-west.

The Parkhill block lies between 200 ft. and 350 ft. and is mainly flat, and where there is a slope the exposure is southerly.

The Glascoego block lies between 250 ft. and 550 ft., the parts at the lower elevation are flat and sheltered. The higher parts have a moderate slope giving a northerly to north-easterly exposure.

Geology and Soils

The Kirkhill block is mainly gneiss at the higher elevation with granite lower down, the soil is a brown sandy loam. There is a peaty layer and leaching on the higher ground.

The Parkhill section is mainly granite with some gneiss. The soils are peaty overlying a shallow compacted leached sandy loam. On more level parts the peat is 12 in. and 18 in. in depth.

The Glascoego section is mainly granite except for the flat low-lying area which is on a gravel terrace. The soil is a brown sandy loam, on the low area there is leaching.

Meteorology

Rainfall - The average annual rainfall is around 30 in. Falls of snow occur every winter but the snow does not lie long and planting is frequently possible at Kirkhill when not possible at Kennay, Pitfichie, Tilliefoure and Corrennie some 9 - 15 miles to the west.

Wind

The prevailing wind is from the south-west. In hard springs the north-east wind causes blasting.

Frost

Frost can be expected from September to March. Severe spring and early summer frosts occur occasionally and have done some damage, especially in the low-lying areas of Parkhill, Glascoego and on the south-east of the Kirkhill block.

Drought

Lack of rain, accompanied by east and north-east winds have caused losses among newly planted trees. The longitudinal splitting of Sitka

spruce which was recorded at Kirkhill in the summer of 1947 was said to be due to drought and the permeable nature of the subsoil. The most recent theories tie these to an abnormal lack of thickening of the cells in the summer wood of the spruce.

Risks

Fire

The fire risk is high. The main road from Aberdeen to the North passes through the block. Since steam waggons have become less common, the danger from roadside fires has diminished, though in the early years, this was a serious risk. The main risk to-day is from trippers from Aberdeen and nearby. The summit of Tyrebagger Hill known locally as "The Tappie" is a popular view point and picnic place. Since the woods have grown up and we have made good roads through them, we have created many very pleasant walks, and while we have no doubt given pleasure and interest to many, the risk from the few careless is very real. Whins abound on the agricultural margins.

The above risks are met by an annually freshened trace on the north side of the main road and by bulldozed traces on the lines of future extraction roads round "The Tappie."

On account of the ubiquitous tripper at week-ends and on holidays, patrolling is our chief safeguard.

Rabbits

The risk from rabbits was seriously underestimated in the early days, and establishment was attempted without fencing. Beating up has been a major item, establishment slow and the resultant crop uneven in the worst places. In 1935-36 and 1937, a considerable fencing programme was carried out on the worst of the earlier planted areas. The scattered nature of the forest, its long boundaries marching with agricultural land, make rabbits a continuous nuisance. Trapping etc. in the unfenced older areas is always necessary in order to avoid complaints from farmers. Most of our agricultural neighbours are prone to complain but loath to kill on their own ground except when prices are good.

Hares

Hares are troublesome in the same way as rabbits, but to a lesser extent.

Deer

Roedeer are fairly numerous and have increased since the wartime fellings in the surrounding district and with the increased cover offered by our young woods. They are controlled by shooting. Damage so far has not been serious and, if numbers can be controlled, these beautiful animals are an amenity in a small forest so near to a large city.

Capercaillie

Capercaillie are present in small numbers and if they do not become too numerous, their presence is not unwelcome.

Squirrels

It is recorded that the acquired woods showed considerable squirrel damage. In recent years squirrel has been uncommon.

Voles

Damage from voles occurs on the heather/grass areas in early spring but attacks are abortive and stop with the coming of the growth of other vegetation.

Weevil

In spite of fairly large wartime fellings no undue damage took place on replanting. Areas were planted four to five years after felling. Trapping was necessary.

Pine Beetle

Now that the older acquired woods have mostly gone and thinnings are being regularly carried out in the forest, the risk from Pine Shoot Beetle is not important.

Pine Shoot Moth

Evetria resinalla is common on young Scots pine and particularly on Pinus contorta.

Fungi

Pomes annosus is recorded to have caused deaths in young trees of all species but deaths from this cause are not now common. Larch canker is present in every European larch stand though there are at least two stands in P.23 which are now in good shape and promise well.

Roads

Roadmaking was begun in F.Y.47 on a rather ambitious scale. The roads made at that time were excellent but somewhat expensive. Later, first-class forest roads were made with quarry waste from nearby quarries. These have stood up well to traffic. The presence of these roads has considerably increased the value of thinnings. In the writer's opinion, the value of 1st and 2nd thinnings has been increased by not less than 4d. per cu. ft. standing.

A road-making plan was prepared in F.Y.51 projecting a road system at approximately 15 years after the planting of an area.

Road-making work will be carried out as follows:-

F.Y. 52	69 chains
53	66 "
54	127 "
60	32 "
64	63 "
65	160 "
66	80 "
67	19 "
68	72 "
Total	<u>688</u> chains

The following table shows the ultimate provision of roads.

Existing Estate Roads and F.C. Roads as at 30.9.51	To be made F.Y.52-68	Total	Total Woodlands and Potential Woodlands
844 cha.	688 cha.	1532	1400 Acres

Slightly more than 1½ miles per 100 acres

Labour

The quality of labour has not been high and recent foresters have had to rely on such local men as had been unable to obtain easier and sometimes more remunerative employment in and around Aberdeen. Planting is nearly at an end and after F.Y.53 a small squad of six to eight men will be sufficient for maintenance work. Only two forest workers live in Forestry Commission houses. Up till four years ago the forester only was housed. A site has been acquired in Blackburn village, one mile from the forest, where it is proposed to erect six houses. These would attract a permanent squad of good workers who would be very readily available at week-ends in times

of fire danger.

SILVICULTURE

General

The older plantations in the forest were planted before ploughs were in general use and little preparation was done except drainage and the cutting of scrub birch. No fencing was done, and a glance at the beating up records shows that this was a serious mistake on such a small area surrounded by agricultural land. As stated earlier in these notes, big fencing programmes were carried out in P.Y.'s 35, 36 and 37.

In the planting of the more recent acquisitions, it was possible to plough only a small area - part of an old croft (P.50). In Compartment 13 (P.48) the tough mat of Aira flexuosa was screefed with a mattock as a preparatory measure and Sitka spruce notched in the middle of the screef. Growth of these plants has been exceptionally good.

In the P.51 area Compartment 46 and 47, a square of tough raw humus was removed before notching Scots pine and Japanese larch into the mineral soil.

It is felt that much of the land planted with Scots pine in the early days was notched into raw humus and grew little for many years. The removal of this peaty layer, preferably by mechanical means, will make for quicker establishment of pines. The tine plough and the disc plough would do the job well, though the humble mattock, in the hands of a good man is not to be despised.

Choice of Species

Appendix III shows the species in the forest by 10 year age classes.

European larch at 55 acres does not give a true picture, the various mixtures of European larch with Scots pine, Japanese larch and Douglas fir have all arisen from attempts to get something growing where European larch has failed due to die back or vermin. Except in P.23 Compartments 17, 18 and 22, the development of larch has been very poor. The moist bracken covered slopes of Compartments 7, 12, 16 and part of 15a were originally planted with European larch.

Canker is everywhere present and though recent thinnings have done much to improve the general appearance, they will never be a decent crop, and the sooner they can be cleared the better. On this area excellent Sitka spruce

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In spite of the low rainfall and the free natural drainage, Sitka spruce has been the most successful species, so far, in the older plantations. It is thought that this may be due to the fact that the forest lies in the narrow coastal belt where exposure is severe. There have, of course, been partial failures of Sitka spruce. The worst of these is in P.25 Compartment 35, where Sitka spruce was notched into a poor wet peat on a flat, difficult to drain properly. Pinus contorta and Scots pine have been introduced from time to time. It is interesting to note that at the south-west end of Compartment 35 on such a site, the colour of the Sitka spruce is good, and this season's growth averages around 8 in. In this part the heather is old and dying out and in a short time the canopy will have closed. Other parts of this area need extensive draining, mounding and beating up with Pinus contorta. In Compartment 27, P.24, Sitka spruce and to a lesser extent Norway spruce have had a long struggle with frost but are now above the frost level and growing well.

Japanese larch has been planted on a variety of situations and has everywhere grown well. It is worth noting the difference in form between the Japanese larch in Compartment 10, P.22, planted on a fresh moist soil suitable for Norway and Sitka spruce with those at the south-east corner of Compartment 3, P.22, and with those, mixed with Scots pine on the east of Compartment 21 (P.23), where the soil is dryer and less rich. Those in the poorer site are not so big but have much straighter and cleaner stems.

Douglas fir are, on the whole, a rough lot but are producing timber quickly. Choice of site is not criticised. They appear to be a coarse type and early removal of "wolves" was neglected.

Scots pine had suffered badly in the early days from rabbits and most of the older plantations have not had a chance to develop properly. They will improve with proper treatment and the passage of years.

In the 0 to 10 years class, 217 acres out of a total of 648 acres were planted with Scots pine. Judging from the present appearance of those in Compartment 8a, P.41, Compartment 53, P.46 (Scots pine and European larch) and Compartment 26, P.46 (Scots pine and Sitka spruce) the choice was a happy one. It has been largely used in P.50 and 51 on the poorer heather clad soils.

Planting

The earlier planting was done at the following spacing:-

European larch	5½ ft.
Japanese larch	6 ft.
Scots pine	4½ ft.
Norway spruce	5 ft.
Sitka spruce	5½ ft.

In recent years the spacings have been those in normal use:-

Scots pine	4½ ft.
Japanese larch	5 ft. - 5½ ft.
Douglas fir	5½ ft.
Norway spruce	4½ ft.
Sitka spruce	5 ft.

The plants used in the first period P.22 - P.29 came mainly from Craibstone nursery which was close to the forest. The ages of plants used were mainly 2 x 2 for all species except European larch which was nearly always planted as a 2 x 1. Beech which was planted mainly in mixture at normal spacing with European larch was planted as a 1 x 2 generally. It would have been better to have planted them at closer spacing in small groups. The survivals are mostly bushlike. Some improvement has been wrought by pruning. Only one case of seedlings having been used has been found. These were Sitka spruce 2 year seedlings planted in "Dr. Steven's Experiment" - Compartment 5, P.24. The experiment was abandoned on account of losses, probably due to rabbits.

Planting progressed as follows, as land became available.

P.22	112 acres	P.41	11 acres
P.23	100 "	P.42	17 "
P.24	140 "	P.44	25 "
P.25	106 "	P.45	35 "
P.26	6 "	P.46	64 "
P.27	48 "	P.47	57 "
P.28	50 "	P.48	70 "
P.29	27 "	P.49	90 "
P.30	7 "	P.50	144 "
	496	P.51	146 "

In P.52 a planting programme of 113 acres will complete all land in hand.

There is no record of manuring having been done in earlier years, but in P.51 on the exposed unfertile sites, 2 oz. per plant of ground mineral phosphate was applied.

No ploughing has been done on Kirkhill except for an area of 8 acres of derelict grassland in P.50, a wide shallow slice was turned out by Solotrac and planted with Norway spruce. Grass re-invaded rapidly and at

least one more weeding will be necessary. We intend to turf a felled woodland area of 30 acres (P.52) with the disc plough and to plant it with Sitka spruce/Scots pine mixture. Heather has come in here and there since felling, though it has been kept in check a little by bad drainage and grazing.

Beating Up

This has been a melancholy feature on Kirkhill. The following table indicates the futility of attempting to plant trees without fencing where rabbits abound.

<u>P. Year</u>	<u>Area</u>	<u>Plants used for Beating up</u>	<u>Period</u>
22	112 acres	79 thous.	F.Y. 29 - 44
23	100 "	156 "	F.Y. 25 - 41
24	140 "	140 "	F.Y. 25 - 41
25	106 "	101 "	F.Y. 29 - 45
27	48 "	71 "	F.Y. 32 - 44
28	50 ⁵³ "	46 "	F.Y. 33 - 38
	559	593	

Weeding

Weeding was prolonged by reason of the extremely late beating up. In recently planted areas - notably P.46 and P.47, broom and whins have caused costly weedings to date, but plants, particularly Sitka spruce are now above the whins. Douglas fir in P.47 suffered somewhat, and it might have been better to have used Japanese larch there to kill out the whins more quickly. The position was aggravated by beating up losses due to the abnormal winter of 1946 - 47. Weeding of grass and bracken areas is normal.

On Aira flexuosa areas, a big screef helps a lot, and one weeding late in the summer is sufficient.

Mixture of Species

As has been noted earlier, the great variety of mixtures present in the early planting have arisen largely through beating up and are in no sense silvicultural mixtures. There are three mixtures planted contemporaneously which are of considerable interest. In Compartment 40 P.29, there are stands of Pinus contorta/Sitka spruce, Pinus contorta/Norway spruce and Scots pine/Norway spruce. All appear to have been planted in a line about mixture. In the Pinus contorta/Sitka spruce mixture, the Pinus contorta have grown particularly well and have in places completely suppressed the Sitka spruce. It should be noted that both species were notched into

heather covered peat and it is not surprising that the Sitka spruce hung back too long to be able later to compete with the Pinus contorta. In the Pinus contorta/Norway spruce mixture the Norway spruce is more in evidence than is the Sitka spruce in the Pinus contorta/Sitka spruce mixture. This may have been due to their being able to bear more shade than the Sitka spruce and possibly to more accidental failure of Pinus contorta.

Of the three stands there will be more spruces in the final crop in Scots pine/Norway spruce mixture. The soil is less suited to Scots pine than to Pinus contorta and it would seem that nature has done a thinning there, that we might have done in the Pinus contorta some 10 years ago.

Where spruce have managed to get away, they are of good form and are finely branched.

The lesson to be learned is surely that the spruce/pine mixture which have been planted in recent years will require to be carefully watched where the nurse species is likely to get too far ahead. The difference in growth is likely to be less pronounced on such ground where ploughing has been done. The spruce will probably benefit more from it than the pine.

The 1:2 pine/Sitka spruce mixture which have been planted may not be so wrong as one imagines to-day. The reference is to wartime planting of 1 Scots pine 2 Sitka spruce where the pine have done well, but where the Sitka spruce are not yet making much of it.

Rates of Growth

Height Growth

The figures in Table I were obtained from the better Forestry Commission planted areas.

Volume

The particulars given in Table II were obtained from 1/5th acre sample plots, representing the better stands.

Thinning

During the war years the forest was run by a skeleton squad and young plantations were somewhat neglected. The first major thinning programme on Forestry Commission planted woods was carried out in F.Y.47. An effort was made in that year to go over all stands in the forest which were requiring attention. In F.Y.48 a thinning plan was prepared. The forest was

divided into three annual thinning areas. This allowed for areas to be thinned once every three or six years.

Prior to F.Y.50, the thinning was done by the forest squad and the produce sold, mainly as long pitwood, rustic wood and fencing posts. In F.Y.50 standing sales were started and continued in F.Y.51.

The thinnings contain an increasing amount of boxwood. The proximity of the forest to the boxmaking mills in Aberdeen is an advantage. Timber not sold standing was issued mainly to make stobs for the home and neighbouring forests.

The following table shows the programme carried out in F.Y.47 to F.Y.51 and the proposed programme for F.Y.52. Standing sales for F.Y.50 yielded a net price of 8½d. per h.ft. and for F.Y.51 - 1/1½d. per h.ft.

<u>Forest Year</u>	<u>Thinning</u>	<u>Area</u>		<u>Volume</u>		<u>Felled by F.C.</u>	<u>Sold Standing</u>
		Acs		H. ft.	O. B.	H. ft. O. B.	H. ft. O. B.
47	1st	94)	- 160	15189)			
			106		18152	18152	-
	2nd etc.	12)	1244	2973)			
48	1st	71)	- 70	5016)			
			95		6062	6062	
	2nd etc.	24)		1046)			
49	1st	43)		4264)			
			91		9939	9939	
	2nd etc.	48)		5675)			
50	1st	24)		2247)			
			88		8317	2290	6027
	2nd etc.	64)		6070)			
51	Pre	42)		974)			
	1st	57)	167	4402)	18449	974	17475
	2nd etc.	68)		11106)			
60919							
<u>Proposals</u>							
52	Pre	87)		1710)			
	1st		151		12350	1710	10640
	2nd etc.	64)		10640)			

The term "Pre-Thinning" is used for convenience to describe cleanings and the early removal of "wolves". Any such operation yielding less than 150 cu.ft. per acre is so named.

Brushing

Some complete brushing has been done, but more recently we have only brushed a sufficient number of trees to permit felling and extraction to be

carried out without hindrance.

High Pruning

A fair amount of high pruning was done on Douglas fir and Sitka spruce in F.Y. 47 and 48 but was stopped in F.Y. 49. It will, in future, be done only as a hard weather job and then only on Douglas fir and Scots pine. About 300 trees per acre were selected and were pruned by boys using hand saws and ladders.

Reports on Visits of Senior Technical OfficersVisit of Chairman and Mr. O.J. Sangar on 17th October, 1932Present:-

Sir Roy L. Robinson
Mr. O. J. Sangar
Mr. R.G. Forbes
Mr. D.V. Murray
Mr. W. McDonald

The Chairman visited Kirkhill Forest on the afternoon of Monday, 17th October, 1932. A 40 year old plantation of Scots pine with some larch, adjoining the main road, was first inspected. The possibility of using the trees for telegraph poles was discussed and one pole which had been felled and peeled was examined. Owing to the bad state of the wood, chiefly owing to squirrel damage in the past, it was decided not to fell trees for telegraph poles now, as in so doing the wood would be opened out too much, but to mark the trees which might be suitable for poles and to thin round these gradually and remove the worst trees by degrees. The selected trees were to be pruned up to a height of 20 or 22 ft. and about 100 - 150 trees to the acre were to be so treated. This procedure is to be carried out over an area of 4, 5 or 6 acres. Later on the market for telegraph poles was to be tried.

The 40 year old spruce and Douglas fir in the hollows were next inspected and their excellent growth, some being 75 ft. high, was remarked upon. The Chairman pointed out that only a very light thinning was required in parts. The sawmill was looked at in passing. Emerging from the wood, the P.22 plantation of Douglas fir was gone through. This had been beaten up rather late with Sitka spruce and the Chairman remarked that he did not consider that the small spruces would stand a chance against the Douglas firs which were already up to 5 ft. high.

Higher up the slope the European larch were examined and in some places the broom had suppressed the trees. The Chairman gave instructions for the broom to be cut back.

The 45 year old Scots pine and spruce higher up were passed through and the difficulty of the extraction of thinnings and blown trees was pointed out. The Chairman remarked that Scots pine did not appear to be

suitable trees for the position. The P.24 Scots pine on the top of the hill were passed through, and the Chairman said that, judging by the older plantations of Scots pine, he was afraid that the crop would not be very good.

Two acres of Sitka spruce (P.24) were then seen on the northern slopes. These were originally planted by the experimental branch but there was a heavy failure and owing to the amount of beating up the experimental branch had dropped the experiment. The Chairman instructed Mr. Sangar to inquire into the circumstances of the experiment.

Moving down the slope towards the main road, the P.24 plantations of Scots pine, European larch and Sitka spruce were seen. The Scots pine on the lower western slopes were seen to be doing well and the same applies to the Sitka spruce although in some parts the Chairman said that more draining was necessary. The larch were of only fair growth but were nearly complete as a crop.

(Signed) DOUGLAS MURRAY,

District Officer.

19.10.32

The Sawmill was working badly. I understand this has been put right. A costing of this mill is being made and this work will be restricted until a good output and return can be shown.

(Signed) R. G. FORBES,

26.10.32

Assistant Commissioner's Visit on 8th October, 1935.

Present:-

Mr. J. M. Murray
Dr. H. M. Steven
Mr. A. Watt
Mr. Wm. McDonald

The following compartments were visited:-

20a & b, 24a & b, 23a & b, 16, 12, 7, 6a & b, 11, 15a & b,
14b, 13, 34, 35 and 36 - P.22, 23, 24, 30 and acquired
plantations.

The difficulty of keeping the rabbits down, owing partly to lack of fencing and partly to the thickness of the plantations, was noted; Mr. Murray thought that where the whins were thick, lines should be cut in the whins to

enable the rabbits to be cleared out.

In one of the acquired plantations (Compartment 13), Mr. Murray thought that more trees might have been pruned, but stated that it was better to have pruned too few than too many.

The small blocks comprising the Glascoego Acquisition were seen and their uselessness for purposes of economical afforestation commented on.

The most important point raised at this unit was the necessity for keeping the rabbits down.

(Signed) A. WATT,

District Officer,

11.10.35.

Visit of Assistant Commissioner on 5th January, 1942.

Present:-

Mr. A. H. Gosling
Mr. L. A. Newton
Mr. I. Gillespie
Mr. J. Lamb.

The Assistant Commissioner and Divisional Officer visited Kirkhill Forest on the afternoon of Monday, 5th January, 1942. The relative positions of the various sections were briefly explained to the Assistant Commissioner in the office, and a visit made to the P.04 acquired plantation in Compartments 19b, 20b, etc., now undergoing a second thinning. On first viewing the stand from the road, the Assistant Commissioner was not too favourably impressed but, after walking through it, he was quite hopeful that a decent final crop would result. He thought that more of the malformed stems could be taken now to catch the present assured market and, to this end, slightly abnormal breaks in the canopy would be justified.

The P.95, acquired plantation in Compartments 13, 14 and 15 was next visited and drew favourable comment from the Assistant Commissioner, who shared the Divisional Officer's surprise that the Home Grown Timber Production Department had not coveted this wood rather than the P.04 plantation. A nice belt of Douglas fir and Norway spruce in a deep ravine was much admired. The Assistant Commissioner thought that a further thinning would soon be necessary in this wood generally.

P.22 was then entered along the ride between Compartments 14 and 15

and the Assistant Commissioner was specially interested in the Douglas fir which he thought was due for brashing and removal of wolf trees. He considered this species required careful handling at this stage, to which the Divisional Officer agreed. The Assistant Commissioner recommended a prompt second thinning of the Japanese larch in Compartment 10 which has closed in very rapidly.

A more dismal aspect of the forest was seen in Compartments 2 and 3, with special reference to poor European larch in heather beat up with Scots pine and later in part with Pinus contorta. The Assistant Commissioner condemned the choice of European larch on this site.

The Assistant Commissioner drew attention to the slow growth but good form of the Japanese larch in the south east corner of Compartment 3 as confirming the generally accepted truth that this tree attains its best form on the poorer sites.

He was rather doubtful about the future of pure Scots pine stands in the more exposed situations.

The Assistant Commissioner was informed that, despite a total of 78 acres felled by the Home Grown Timber Production Department there remained about 70 acres of acquired plantations in the forest. He was also interested to learn that the entire squad of four were ex Craibstone and proving themselves useful and conscientious forest workers.

The Assistant Commissioner and Divisional Officer were agreed as to the prime urgency of overtaking arrears of brashing and thinning of the older Forestry Commission plantations.

(Signed) I. GILLESPIE.

7.1.42.

No comment - Acting Divisional Officer.

Actually Timber Production Department will probably ask for both P.04 and P.95 plantations during 1942. They have not expressed a preference for P.04. If the situation demands it, I propose to let P.04 go and retain P.95 but we should thin the latter. Other thinnings must also be done.

(Intd.) A.H.G.

18.1.42

APPENDIX II

Supervisory Staff during the Life of the Forest

Conservators

H. C. Beresford Peirse	1946 - 1947
F. Oliver	1947 continuing

Divisional Officers

J. F. Annand	1922 - 1932
R. G. Forbes	1932 - 1933
H. M. Steven	1933 - 1938
F. Scott	1938 - 1939
L. A. Newton	1939 - 1945
T. H. Woolridge	1949 continuing

District Officers

I. Clark	}	1921 - 1926
J. W. Mackay		
D. H. Bird		
J. K. Leven		1926 - 1927
R. Cowall Smith		1927 - 1931
D. V. Murray		1931 - 1934
A. Watt		1934 - 1938
T. H. Woolridge		1938 - 1939
I. Gillespie		1940 - 1947
R. J. G. Horne		1947 - 1951
W. F. French		1951 continuing

Foresters

A. H. Hannay (Foreman)	1922 - 1923
J. McConnell (Foreman)	1923 - 1925
J. M. Kennedy (Foreman)	1925 - 1928
T. Allan do	1928 - 1929
W. McDonald (Foreman)	1929 - 1938
do. (Forester)	1938 - 1939
J. A. Lamb (Forester)	1940 - 1944
W. McDonald (do.)	1944 - 1949
G. Gilbert (do.)	1949 continuing

I. Gault

R. W. Hughes

- 1958

1958 continuing

Acres of the various species at L. D. 51

Age Classes Years	D.F.	S.P.	C.P.	P.C.	E.L.	J.L.	N.S.	S.S.	H.L.	D.F.	J.L.	E.L.	J.I.	N.S.	E.L.	P.C.	E.L.	S.S.	S.S.	E.L.	S.S.	C.H.	S.S.	D.F.	E.L.	Other Species	Total
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	
0 to 10	61	217	2	13	16	96	83	145	10																5	648	
11 to 20		13				12	15	3																		43	
21 to 30	32	124	3		39	31	30	139		12	14	4	12	7	40	3	13	3	22	16	22	7		4		577	
51 to 60		4				1																		14		19	
Totals	93	358	5	13	55	140	128	287	10	12	14	4	12	7	40	3	13	3	22	16	22	7		9		1287	

History of Kirtball Forest

APPENDIX IV

Rates of Growth

Species	Age	Cpt. No.	Average Ht. to Tip	Av. Annual Growth for Last 3 Yrs.	Vegetation, Geology and Soil	Altitude	Aspect	Exposure
S.P.	6	25	5' 9"	18"	<u>Veg.</u> - Aira flex., other grasses, Calluna, bramble. <u>Granite</u> - slightly podsolised, coarse sandy drift with granite and gneiss stones, compacted - rather moist.	390'	N.E. Slight slope	Sheltered
	10	8a	9' 6"	20"	<u>Veg.</u> - Calluna, gorse, Aira flex. mosses. <u>Granite</u> - a fairly heavily podsolised coarse sandy drift.	530'	N.E. Slight slope	Sheltered
	22	40	23'	10"	<u>Veg.</u> - Mil. Granite - 12" black peaty mould over 5" dark brown sand with much organic matter - then a line of incipient pan and compacted yellowish sand with traces of gley.	500'	Flat	Sheltered
E.L.	5	25	8' 6"	21"	<u>Veg.</u> - Mixed grasses, mainly Aira flex., Epilobium, Rubus foxglove, Oxalis etc. <u>Granite</u> - slightly podsolised drift of coarse sand and stones of granite, gneiss, quartzite and mica schist, compacted - no pan.	400'	N.E. Fair slope	Slightly exposed to N.E.
	26	9	40' 6"	12"	<u>Veg.</u> - Sparse Oxalis, Aira flex. etc. <u>Granite</u> - A slightly podsolised, sandy, stony drift - dry and fairly compacted.	550'	S	Exposed to S.E. and S.W.

Veg. - Aira flex. etc.

22	40	23'	10"		5" dark brown sand with much organic matter - then a line of incipient pan and compacted yellowish sand with traces of gley.	500'	Flat	
5	25	8' 6"	21"		<u>Veg.</u> - Mixed grasses, mainly <i>Aira flex.</i> , <i>Epilobium</i> , <i>Rubus foxglove</i> , <i>Oxalis</i> etc. <u>Granite</u> - slightly podsolised drift of coarse sand and stones of granite, gneiss, quartzite and mica schist, compacted - no pan.	400'	N.E. Fair slope	Slightly exposed to N.E.
26	9	40' 6"	12"		<u>Veg.</u> - Sparse <i>Oxalis</i> , <i>Aira flex.</i> etc. <u>Granite</u> - A slightly podsolised, sandy, stony drift - dry and fairly compacted.	550'	S	Exposed to S.E. and S.W.
4	54	5' 6"	13"		<u>Veg.</u> - <i>Aira flex.</i> , <i>Calluna</i> , raspberry, mosses, <i>Oxalis</i> . <u>Granite</u> - 2" black decomposed litter, grey/brown leached coarse moist sand, many stones, at 9" yellow/red coarse sand - with stones - granite and mica schist etc.	510'	E	Moderate to N. & E.
29	1	45'	10"		<u>Veg.</u> - Sparse <i>Oxalis</i> , <i>Aira flex.</i> etc. <u>Granite</u> - a brown forest soil - fairly deep sandy drift, lightly leached - colour reddens at 9" - no pan.	550'	S Slight slope	Sheltered
6	25	8' 3"	25"		<u>Veg.</u> - <i>Calluna</i> , <i>Aira flex.</i> , grasses, broom, bracken and mosses. <u>Granite</u> - a sandy drift with yellowish brown fine sand and granite rocks, slight leaching, reddening at 9" - no pan.	400'	S Slight slope	Sheltered
26	9	41' 6"	20"		<u>Veg.</u> - Nil. <u>Granite</u> - soil derived from peat, now mineralised and decomposed with a lumpy black mould over yellow/brown sand containing many granite boulders - fairly moist.	530'	S & W. Slight slope	Moderately to S.E. & S.W.
15	58	18'	20"		<u>Veg.</u> - Mixed grasses, <i>Ranunculus</i> , <i>Oxalis</i> , mosses, <i>Granite</i> - 12" grey brown coarse bleached sand - reddish and yellowish oxidised patches fairly moist.	300'	Slight slope to W.	Sheltered
28	17	40'	18"		<u>Veg.</u> - Nil. <u>Granite</u> - a sandy, stony drift, lightly podsolised, no marked leached layer - no pan - fairly deep and dry, compacted grey/brown turning to yellowish brown.	450'	N.E. Mod. slope	Moderate to E. only
6	25	6'	20"		<u>Veg.</u> - <i>Calluna</i> , <i>Aira flex.</i> , mosses, bracken, grasses. <u>Granite</u> - a sandy stony drift which has been lightly podsolised, no marked leached layer - no pan, fairly deep, dry and compacted.	410'	Mod. slope to N.E.	Moderate to E. only

E.L.

J.L.

D.F.

H.S.

J.L.	4	54	5' 6"	13"	Veg. - <i>Aira flex.</i> , <i>Calluna</i> , <i>raspberry</i> , mosses, <i>Oxalis</i> . <i>Granite</i> - 2" black decomposed litter, grey/brown leached coarse moist sand, many stones, at 9" yellow/red coarse sand - with stones - granite and mica schist etc.	510'	E	Moderate to E. & E.
	29	1	45'	10"	Veg. - Sparse <i>Oxalis</i> , <i>Aira flex.</i> etc. <i>Granite</i> - a brown forest soil - fairly deep sandy drift, lightly leached - colour reddens at 9" - no pan.	550'	S slight slope	Sheltered
D.F.	6	25	8' 3"	25"	Veg. - <i>Calluna</i> , <i>Aira flex.</i> , <i>gorse</i> , <i>bracken</i> and mosses. <i>Granite</i> - a sandy drift with yellowish brown fine sand and granite rocks, slight leaching, reddening at 9" - no pan.	400'	S slight slope	Sheltered
	26	9	41' 6"	20"	Veg. - Nil. <i>Granite</i> - soil derived from peat, now mineralized and decomposed with a lumpy black mould over yellow/brown sand containing many granite boulders - fairly moist.	530'	S & W. slight slope	Moderately to S.E. & S.W.
H.S.	15	58	18'	20"	Veg. - Mixed grasses, <i>Ranunculus</i> , <i>Oxalis</i> , mosses, <i>Granite</i> - 12" grey brown coarse bleached sand - reddish and yellowish oxidised patches fairly moist.	300'	Slight slope to N.	Sheltered
	28	17	40'	18"	Veg. - Nil. <i>Granite</i> - a sandy, stony drift, lightly podsolised, no marked leached layer - no pan - fairly deep and dry, compacted grey/brown turning to yellowish brown.	450'	N.E. Mod. slope	Moderate to E. only
S.S.	6	25	6'	20"	Veg. - <i>Calluna</i> , <i>Aira flex.</i> , mosses, <i>bracken</i> , <i>gorse</i> . <i>Granite</i> - a sandy stony drift which has been lightly podsolised, no marked leached layer - no pan, fairly deep, dry and compacted.	410'	Mod. slope to N.E.	Moderate to E. only
	10	8a	16'	22"	Veg. - Grass herb - <i>Aira flex.</i> , <i>Aira caespitosa</i> - some <i>Calluna</i> . <i>Granite</i> - 2" black organic matter on leached layer - yellowish/brown coarse sand, boulders and sharp stones - granite and mica schist.	510'	Slight slope to N.E.	Sheltered
	22	39	41'	38"	Veg. - Nil. <i>Granite</i> - 6" black peaty mould over a yellow/brown sand + stones and boulders of granite and gneiss.	300'	S. on slight slope	Slight to E. & S.
	26	9	49' 6"	22"	As for D.F. in Opt. 9. above.	520'	As for D.F. in Opt. 9. above.	

Volume data

Species	P. Yr.	Opt. No.	Number of Trees per acre.	Volume to 3" dia. H.ft. O.R. per Acre	Volume Removed in Thinnings to Date H.ft. O.R. per acre	Total Volume to Date H.ft. O.R. per acre	Current Annual Increment of Present Crop Based on Last 3 Yr. Growth H.ft. O.R. per acre	Geology and Soil	Altitude	Aspect	Exposure
S.P.	27	33	1090	1362	60	1422	124	Granite - a sandy drift, sand coarse in texture - grey brown/red brown - at 18" finer yellowish sand with fewer stones.	200'	Flat	Sheltered
E.L.	25	9	475	1821	173	1994	123	Granite - Veg. Sparse Oxalis slightly podsolised sandy, stony drift, dry and fairly compacted.	550'	S	Moderate from S.E. & S.W.
J.L.	22	1	500	2875	320	3195	200	Granite - A brown forest soil - fairly deep sandy drift, lightly leached - colour reddens at 9" - no pan.	550'	S Slight slope	Sheltered
D.F.	25	9	775	3552	264	3816	361	Granite - soil derived from peat now mineralised and decomposed into a lumpy, black mould over yellow/brown sand containing many granite boulders - fairly moist.	530'	S. & W. Slight slopes	Moderately exposed to S.E. to S.W.
N.S.	23	17	920	3066	232	3298	153	Granite - a sandy, stony drift, lightly podsolised, no marked leached layer - no pan - fairly deep and dry, compacted - grey brown turning to yellowish brown.	450'	N.E. mod. slope	Moderate - to E only.
S.S.	25	9	595	3867	108	3915	376	As for D.F. opt. 9 above	520'	as in DF opt. 9 above	Slight from S.E. and S.W.