Forestry Commission

Form WP 22

WORKING PLAN

TABLE OF CONTENTS

PART I

Chapter Number	Heading
1	Introduction
2	Site
3	History
4	Estate Management
5	Amenity
6	Growing Stock
7	Organisation
8	Planting Rate and Resumption of Land
9	Silvicultural System
10	Crop Establishment
11	Crop Maintenance
12	Crop Improvement
13	Regulation of Yield
14	Forest Roads and Access
15	Powered Vehicles and Machines
16	Marketing and Exploitation
17	Risks
18	Nurseries
19	Staff and Labour
20	Houses and Holdings, Other Buildings and Special Installations
21	Research and Experiment
22	Other Factors
23	Working Plan Annual Report

PART II

Chapter Number	Heading
24	Summary of Facts on which to base Proposals
25	Objects of Management
26	Summary of Prescriptions for Achieving the Objects of Management

PART III

27	Estate Management
28	Amenity
29	Organisation
30	Planting Rate and Resumption of Land
31	Silvicultural Systems
32	Crop Establishment
33	Crop Maintenance
34	Crop Improvement
35	Regulation of Yield
36	Roads and Access
37	Powered Vehicles and Machines
38	Marketing and Exploitation
39	Protection
40	Nurseries
41	Staff and Labour
42	Houses and Holdings, Other Buildings and Special Installations
43	Other Prescriptions

DS 39873/5/2572/3 4m 2/59 DL (Revised June 1963, Amendment No.1)

PART I

Chapter 1. Introduction

(a) Situation and Extent

The main forest area lies along the southern slopes and approaches to the Dee Valley, in widely scattered blocks stretching from the coast to Banchory, eighteen miles inland. There are numerous further blocks north of the river.

Total area at 30th September 1961 is 6,623 acres.

(b) Civil Administration

County Councils:	Kincardine Aberdeen
Rural District Councils:	Upper Deeside District Council
Parishes:	Durris Drumoak Banchory Ternan Peterculter Fetteresso Maryculter Banchory-Devenick Strachan
Parliamentary constituencies:	North Angus and Mearns East Aberdeenshire

(c) Nearby Towns

Town	Population (1951)	Miles from Kirkton of Durris
Aberdeen	187,300	13
Stonehaven	4,481	12
Banchory	1,903	5

(d) Communications and Transport

1. Railways

Stations on the Deeside Branch line are:-

Station	Facilities	Distance to Nearest Point of Forest	Distance to Forest Office miles
Aberdeen	Full handling and road delivery	3	13
Cults	Unmanned	3	10
Culter	Full wagons accepted	1	7
Park	None	2	3
Crathes	Unmanned	¼	2
Banchory	Full wagons	3	6
On the main Edinburgh-Aberdeen line is			
Portlethen	None	2	10

2. Roads

The forest is well served by an intricate network of minor roads.

3. Ports and Harbours

Aberdeen - modern docking and cargo handling facilities.

Chapter 1 Para. (e)

(e) Maps

6" to 1 mile scale - 1/10560 O.S. National Grid Sheets (Provisional Edition)

Aberdeenshire/Kincardineshire	NJ 70 SW
	" " SE
	" 80 SW
	" " SE
	" 90 SW
	NO 79 NW
	" " NE
	" " SW
	" " SE
	" 89 NW
	" " NE
	" " SW
	" 99 NW

2½" to 1 mile scale - 1/25000 (Provisional Edition)

NJ	70	80	90
NO	79	89	99

1" to 1 mile scale - 1/63360 (Seventh Series)

Sheet No. 40

Chapter 2. Site

(a) Geology

The region consists of Highland schists of the Dalradian series. The metamorphism has been of mainly sedimentary rocks, giving mica-schists and biotite gneiss. Older granites frequently intrude, appearing on the north edge of the forest at Hill of Fare and on the northern parts of Drum Estate. South of the Dee they reappear at Cairnshee and Cairn-mon-Earn, and in the protruding masses of Auchlunies in the east.

Only on the dominant heights does the rock formation emerge from the overlying glacial drift which covers the whole area with a stony compacted till of greatly varying depth.

(b) Soils

Topographical peat fills the hollows at the higher levels along the southern rim of the forest. This merges into a thin fibrous peat covering extensively leached till on slopes and harder ridges. Only on the lower slopes above the Dee do well-developed stony loams appear. These are old woodland sites, and they too show evidence of leaching.

Soils are freely drained, with only occasional discontinuous iron pan. But the frequent compaction in the glacial drift is impenetrable to roots, often at quite shallow depth.

(c) Topography

The forest occupies the harder ridges and higher eminences along the gently sloping southern flank of the Dee valley, with a generally northerly aspect.

(d) Meteorology

Although the most easterly block of the forest is within a mile and a half of the North Sea, the main area escapes the harshest coastal effects. South-west to west winds prevail, and from this direction through north to north-east most of

the area is exposed. Indeed, the expansion of the forest to within five miles of Stonehaven, brings south-easterlies to bear on this flank too.

Rainfall of 32" a year falls mainly in the late summer and winter, though the only markedly dry periods are between February and June, when high fire danger may persist.

Snowfall is not usually severe, though the higher plantations may drift up badly for short spells.

(e) Vegetation

Upland areas carry dominant heather, with bracken on freely-drained flushes and juncus in marshy hollows.

Peat flats carry scirpus and eriophorum with sphagnum moss locally.

In the dense spruce stands the ground flora is all but eliminated; rushes, fern and grasses returning where the crop has been opened; and heather surviving in areas where the canopy has not closed.

Larch stands tend quickly to become reinvaded with deschampsia, ferns, oxalis and brambles on opening by thinning, and this may affect the cost of introducing underplanted species to these plantations.

Former grazing and burning, and present enclosure and afforestation conspire to conceal the true stage of development of the vegetation. Peat moss may well have reached a climatic climax, whereas heaths are at a seral stage towards a woodland association.

Whatever the state of balance the forester's present activity tends to telescope the seral succession and to accelerate the emergence of a climax situation.

(f) Site Classification

1. By the Soils

The blanketing of the entire region with glacial drift imposes a superficial uniformity on all sites. The climate through the ages since its deposition has, however, acted differentially on this boulder till by virtue of the micro-topography. Thus at the one extreme, hollows of impeded drainage have amassed great depths of basin peat, whilst at the other, hard ridges have been altogether denuded of soil cover to expose the underlying native rock. The drift soils deriving from the residual deposits show podsolization throughout the entire range of sites, for even well-developed woodland soils reveal evidence of leaching.

The degree of podsol development increases with the freedom of vertical water percolation, the final stage of which is the iron pan, as is found over large areas of Cairn-mon-Earn. This provides the broad basis of our site classification

As we have noted, differences in soil development are largely the result of topographical variations, and as one might expect, a close correlation of soil with land shape exists. Indeed it is almost as useful to identify the site by land contour as by the soil overlying it.

Using this basis, four sites can be broadly classified, and the land forms associated with each can be identified. It must be understood that one frequently merges more or less gradually into another in the same wood. The allocation of plantations to one or another site, which follows, is of necessity on the broadest lines. For example, Monthammock is listed under "Peaty Podsol". This is true of the main "whale-back" of the area, supporting Scots Pine, although the lower and more productive part is old arable land classified as a gleyed podsol and carrying a vigorous Sitka Spruce crop.

Chapter 2 Para. (f)1.

The sites are as follows:-

	Soil Type	Associated Vegetation	Broadly identifiable Crop	Associated Land Form
A.	Fibrous peaty podsol over glacial drift	Calluna'vaccinium	SP'EL, PC, JL'HL and SS	Dome-shaped hills, shoulders, moderate slopes.
B.	Gleyed podsols over boulder clay	Calluna'grass Juncus	SS/NS	Flat plateaux, gentle slopes
C.	Woodland stony loams, some podsolization	Grass'bracken, ferns, bramble	DF, SS, Abies spp, Hardwoods: Beech Sycamore	Dens, burns, steep slopes at lower elevations.
D.	Peat bog, mineral soil below rooting depth.	Calluna'scirpus eriophorum erica tetralix	SS'PC	Basins, hollows with poor natural drainage.

A tentative allocation of woods to the above sites follows:-

Site A.	B.	C.	D.
Garrol	Cairnhill	North Brae	Strans Burn
Mulloch	West Balbridie	Balbridie	Stan Burn
Cairnshee	Sunnyside	Barns	Clash Burn
Funach	Hilton	Balladrum	Black Burn
Crossroads	Maryculter	Kirkton	Duffs Hill Farm
Cairnfauld	Woodlands	Ashentilly	Auchlunies peat moss
Free Kirk	Slug	Warren	
Clune	Baads	Craiglug	
Monthammock		Kinclune	
Denside		Banchory-Devenick	
Craigiedaff		Auchlunies Policies	
Strathgyle		Strathie	
Bruntyairds		Craigton	
Brachmont			
Currackstane			
Newmillhill			
Clochandighter			
Duffs Hill			
Pitcowdens			
Target			
Mundernal			
Kilduthie			
Collonach			
Leuchar			
Bawdy Craig			
Little Sheil Hill			
Cairn mon Earn			

2. By the Vegetation

The ability of Calluna to colonise and dominate almost every site on the forest makes a classification by vegetation of limited value. But the associations in which it appears give some guide to the moisture status of the site, and this in turn relates broadly to the tree species to be encountered. In this connection, however, Sitka spruce is so ubiquitous that, like Calluna, it is its associates that give the pertinent comment on site selection.

Moving from dry site to wet we can again identify four main associations:-

	Dominant Vegetation	Associated Conifers
A.	Calluna'vaccinium, erica cinerea	SP'PC'EL, JL/HL and SS
B.	Calluna'grass, bracken	SP'SS, JL, DF
C.	Grass'Juncus spp.	NS'SS
	Calluna'Scirpus'eriophorum, erica tetralix	SS'PC

Larch stands are early colonised by a grass'oxalis association, a modification brought about by the tree crop to its environment.

Chapter 3. History

(a) Local History

The name Duires or Dores derives from the Gaelic, meaning a mouth or entrance. A hunting forest, containing a castle of some strength, it was occupied by Alexander III in the thirteenth century.

When Edward I overran most of Scotland he gave the Keepership of the forest to his allies the Cumin family. A mandate of 1292 mentions the Earl of Buchan holding the post. On 13th July 1296 Edward spent a night at the castle, "a manour among the mountains".

The Cumin downfall during the reign of Robert the Bruce led to the confiscation of much of their land, and in 1308 Durris was in the hands of the Crown.

King David II granted the lands to William Fraser, son of the Lord Chamberlain of Scotland under Robert the Bruce, and they remained in the hands of this family until the Wars of the Covenanters. In 1639 Forbes of Leslie "a gryte Covenanter" occupied Durris Castle when it was attacked by the Royalist Gordons who "gat good beir and aill, bruk up girnellis and book (baked) bannokis at good fyres, and drank mirrelie upone the lairdis best drink, syne careit away with thame alss mekill victuall as they could beir, quhilk they culd not get eatin and destroyit". (Spalding, Trubles I).

In 1645 Durris was again plundered, when on 17th March Montrose set fire to "the place, lauche bigging and haill cornes and spolzeit the haill ground of horss, nolt, scheip and uther goodis." (ibid).

Durris House, which had replaced the original castle, was burned to the ground.

Soon after these troubles the estate passed to Lord Fraser, the Philorth branch of the family, but in 1669 it was bought by Sir Alexander Fraser, a descendant of the original family, from whom it passed by marriage of an only daughter, to the Second Duke of Gordon. In his hands, improved methods of agriculture were introduced, and large tracts were planted with trees.

Towards the end of the eighteenth century, John Innes, Sheriff Substitute of Kincardine, took a long lease of Durris, until in 1834 it was sold to

Anthony McTier.

A glimpse at the economy of the parish at that time (4) reveals that in 1845 the gross income was £13,412 per annum. This derived almost entirely from farming. Rents for arable land were just under £1 per annum per acre. Summer grazing let for £1 per ox or cow, and wintering 30/-. The keep of a sheep was 2/6d. a year.

Despite the attention of the Duke of Gordon to afforestation there were only 1,000 acres of plantation in the parish.

Today, when salmon fishings change hands for astronomical sums, it is notable that the reach of the Dee lying in Durris parish was worth only £13 per annum. The anxiety of the modern riparian owner regarding coastwise development in the fishing industry finds echo here, for stake and bag nets at the rivermouth were blamed for the scarcity of fish upstream.

Fuel in the mid-nineteenth century was still extensively peat and turf, though cheaper coals were becoming available, and in Banchory Devenick and Maryculter parishes had largely supplanted local fuel.

These adjoining parishes had thriving plantations at Murtle, Ardoe and Kingcausie, of larch, spruce, birch and beech, although of Banchory Devenick it was stated that there was less planted than there could be, with suitably sheltered land remaining bare.

The Kingcausie woods were recorded as harbouring a considerable number of roe deer; and rabbits, formerly unknown, were frequent.

"Hogg's Charity" provided for education and help to the poor of the parish. The benefactor was a native of humble origin, who prospered as a merchant in London. In his early years he had herded stock on Cairnshee, and his 1787 endowment provided the sum of 10/- annually to the herds there "to make a mid-summer fire on that hill." Henderson (2) records in 1892 that the occasion was still observed, although the estate records show the hill to have been planted as early as 1843 (6). There seems little fear of a revival of the custom.

Mr. McTier continued the improvements started by the Gordons, and in 1871 the estate was sold to Dr. James Young for £300,000 (3). This enterprising Fifer amassed a considerable fortune by his discovery and marketing of paraffin oil. On his death in 1883 his son inherited Durris, by whom it was sold in 1890 to Mr. H. R. Baird. The house, policies, home farm and part of the hill are still in the hands of this family. But in 1931, following the death of Mr. H. R. Baird, much of the rough grazings, farms and sporting rights, including those over the woodland areas, passed to Mr. A. G. Johnston, Tilbouries. At the same time Messrs. A. and G. Paterson bought most of the timber, and the Forestry Commission the afforestable land.

Mr. Johnston died in 1959 and there was a further break-up of the property: Tilbouries kept only the east-end shootings, Viscount Cowdray buying most of the farms, river and woodland shootings. The Forestry Commission bought the Cairn-mon-Earn area, and Westhills of Durris was sold to Col. H. A. Foster, Park House.

(b) Forest or Land Management prior to acquisition by the Forestry Commission

That Durris was an important hunting forest as early as the twelfth century is evident from its early mention in the Chamberlain Rolls. Andrew Jervise (II2) notes that the offices of Sheriff and Forester were often united, and in a list of Sheriffs of the Mearns this is found to be so at Durris. But this did not necessarily imply a wooded area, any more than does deer forest today. There is little indication of the woodland extent.

References in the seventeenth century to the plundering of Montrose's forces indicate that agriculture was then highly developed, and plainly formed the main-stay of local economy. Although peat and turf were used as fuel, there is little mention of fuelwood.

Not until the lands came to the Second Duke of Gordon in the eighteenth century do we read of agricultural improvements and afforestation. In the case of planting this could not have been extensive, for as we have seen, there were only 1,000 acres of plantation in the parish in the mid-nineteenth century. From that time there has been a continued and expanding interest in forestry, so that by the turn of the century Durris enjoyed a wide reputation for the successful introduction of exotic conifers, with many fine specimen trees in the policies.

There is a very complete account (6) of the plantations formed from 1840 onwards. Scots pine, European larch and Douglas fir were the main species used, with Norway spruce less widely. Sitka spruce was first introduced in 1850 (1) and its extensive use on exposed moorland sites was amongst the earliest pioneering work with this species in Scotland. At 60 years the species was recorded in 1910 as having a height of more than 90', girths from 6'-9' and 30' of clean stem. Its resistance to blast, and superiority over the Scots pine, European larch and Norway spruce planted with it were noted. Estate planting was at 3½' on good soils, 3' on poor high sites. A long rotation, of 100-120 years, was recommended to give high quality sawn timber, with 40 years for a pulpwood market. Light and deferred thinnings of both Sitka spruce and Norway spruce were advocated in order to produce high quality timber.

Seeding of Sitka spruce was not regarded as prolific, starting at 35-40 years. The nineteenth century forester was on his guard against using the tree where spruce fungus was known to be present.

Douglas fir was introduced at Durris in 1836 (1) and by 1908 i.e. at 72 years, the original tree was 114' high with a girth of 12'6" at 5'. It contained 300 cubic feet of timber. Early introduction was of Green (Oregon) Douglas, which was mixed with oak, beech, spruce, silver fir (7). There was no systematic mixing, and no pure plantations. Using 2 + 1 or 1 + 2 stock it was planted at 4'-5'. Even on the highest parts of the estate, where it was planted along with Sitka spruce it outstripped it, and also Scots pine and European larch. Notch planting was thought to lead to instability, and pit or ball planting were advocated. An annual growth of 2' up to 60 years is recorded, with pole stage growth of 4' a year.

Douglas fir was the species most favoured for underplanting and as a soil improver. European larch was thinned strongly at 20-30 years, selected stems remaining. Damage by game was not found to be serious, and no disease was seen in either species. Blue (Colorado) Douglas was introduced in 1866-71, planted with Scots pine and Norway spruce, but it was not a successful timber tree (1).

The early management records (6) reveal the persistence with which the foresters repeatedly beat up or even replanted in the face of heavy browsing by rabbits and hares. Establishment took many years to achieve.

There was little systematic thinning, intermediate yields coming from blown, suppressed and dead trees.

Crop renewal was by clear felling and replanting, at around 60 years of age. Messrs. Dyer, Peebles; Bisset, Aberdeen; and A. and G. Paterson, Glasgow and Aberdeen; were the main purchasers. The last bought all the mature timber at the break-up of the estate in 1930, when the total woodland area was 2,362 acres, comprising 1,850 acres planted between 1843-1885 and 512 acres of young woods. 500 acres had been cut but not replanted.

Bibliography

I. 1. Crozier, John D. "The Douglas Fir as a Commercial Timber Tree", from Transactions of the Royal Scottish Arboricultural Society Vol. XXI; 1908 p.33. "The Sitka Spruce as a tree for Hill Planting" ibid. Vol. XXIII 1910 p.10.

2. Henderson, John A. Annals of Lower Deeside, 1892.

Chapter 3 Bibliography (contd.)

3. Mackintosh, John. History of the Valley of the Dee, 1845.

4. New Statistical Account of Scotland 1845.

5. Proceedings of the Society of Antiquaries of Scotland 1880.

6. Register of Plantations of Durris Estate 1840-1929.

7. Yeats, Alexander. "Douglas Fir on Durris Estate", from Transactions of the Royal Scottish Arboricultural Society 1899 Vol. XVI p.185.

8. Spalding, "Trubles I".

Books not referred to but believed to be useful

II. 1. Anderson "Black Book of Kincardineshire".

2. Jervise, Andrew. "Memorials of Angus and Mearns" Vol. 1.

3. " " "Epitaphs II"

4. Robertson, "General View of Kincardineshire".

5. " "Index of Scottish Charters".

Forestry Commission

Acquisitions and Disposals

Form WP 10

Schedule of Information from Conveyances, Dispositions, Leases and Feus

Working Plan Area Durris

Number (1)	Date (2)	Name of other party (3)	Property (4)	How acquired or disposed of (5)	Area (acres) Classified as plantable on acquisition (6)	Total acquired or disposed of (7)	Net Total to date (8)	Compartment Number(s) (9)	Reservations (10)
1	1931	Trustees of H.R. Baird	Durris	Purchase	3536	3680	3680	1-110, 144, 202	
2	1936	F. R. Bucklesby	Maryculter		156	162	3842	140-147	
3	1952	Trustees of Sir J.L. G. Burnett	Crathes Estate (part)	Transfer (feu) from Blackhall	160	160	4002	115-120	
4	1954	H. Q. Forbes Irvine	Drum Estate (part)	Purchase	334	338	4340	127-137	
5	1955	Trustees of Sir J. L. G. Burnett	Crathes Estate (part)	Feu	103	103	4443	123-126	
6	1957	" " " "	" " No. 2	Purchase	158	171	4614	111-115	
6	1958	" " " "	" " " "	Excambion	13	13	4601		1.5 acs to F.C. by Purchase. 14.5 acs. from F.C. by Sale
7	1958	Mr. J. Skinner	Parkhead Farm (part)	Purchase	17	17	4618	147	
8	1958	Mr. David Stewart	Banchory Devenick (pt)	Transfer from Countesswells	47	48	4666	149-151	
9	1959	Trs. of G. M. Fulford	Duff's Hill	Purchase	63	63	4729	160-161	
10	1960	J. W. Barbour	Wester Ord (part)	"	9	9	4738		
10	"	" " "	" " "	Transfer to Kirkhill	9	9	4729		
11	1959	Capt. P. Duguid	Auchlunies (part)	Feu	177	187	4916	152-158	
12	1959	Durris Estates Ltd.	Durris No. 2	Purchase	450	450	5366	162-174, 177, 178	

2669. Wt.P79005. 8M. 4/60. C.P.C55842. Gp.773.

Forestry Commission

Acquisitions and Disposals

Form WP 10

Schedule of Information from Conveyances, Dispositions, Leases and Feus

Working Plan Area Durris

Number (1)	Date (2)	Name of other party (3)	Property (4)	How acquired or disposed of (5)	Area (acres) Classified as plantable on acquisition (6)	Area (acres) Total acquired or disposed of (7)	Area (acres) Net Total to date (8)	Compartment Number(s) (9)	Reservations (10)
13	1961	Mr. A. Rattray	Redmyre Farm (part)	Purchase	10	11	5377	158	
14	1960	Trs. A. G. Johnson	Durris No. 3	"	731	1228	6605	173-201	
15	1961	Wm. Findlay Jr.	Cairnieburn	"	17	18	6623	206	

2669. Wt.P79005. 8M. 4/60. C.P.C55842. Gp.773.

Forestry Commission

Statement of Land Utilisation

Form WP 11

Working Plan Area Durris

Areas in acres

As at 30.9.19	Plantations				Land to be planted					Nurseries	Agricultural and Grazing Land	Holdings	Unplantable	Other	Total
	Acquired	Planted by F.C.			For Afforestation		For Replanting		Total						
		Before 30.9.1946	Since 30.9.1946		In hand	Tenanted	In hand	Tenanted							
			Afforested	Replanted											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
'61	178	1893	655	1909	1209		185		1394		195.	3	408	10	6623 + 22 pre-entry

2669. Wt.P79005. 8M. 4/60. C.P.C55842. Gp.773.

Forestry Commission

Form WP 12

Schedule of Plantable Land

Working Plan Area Durris

Areas in acres

Property, Compartment or Sub-compartment (1)	As at 30.9. 61 (2)	As at 30.9. (3)	As at 30.9. (4)	As at 30.9. (5)	As at 30.9. (6)	Remarks (7)
Durris No. 2	306					
" " 3	936					
Auchlunies	64					
Cairnieburn	17					
Sunnyside 39h	8					
f	2					
Hilton	20					
Kirkton 41e	2					
Cairnshee 14f	2					
Munderal 54	5					
66	1					
144	3					
202	7					
Birch areas	21					
	1394					

2669. Wt.P79005. 8M. 4/60. C.P.C55842. Gp.773.

Chapter 4. Estate Management

(a) - (c) See W.P.s 10-12

(d) Considerations affecting land management

1. Boundaries and Fencing Liability

Type of Boundary

Most blocks are bounded by stone dykes marching with arable land, or march fences, which in a few cases are new boundaries previously unfenced. These are at:-

Garrol Wood
Craigton Quarries
Parkhead
Blackburn Moss to Eddieslaw - where the march follows distinct boundary stones.

Fencing Liabilities

(i) There are 77.8 miles of plantation rabbit fence to be maintained at the sole expense of the Forestry Commission. Most of this length is within existing stone dykes, the true march separating woodland from arable or grazing. Rabbit fences are being removed when plantations are open enough to permit their being kept free of vermin. This will continue to be done progressively as fences reach the end of their economic life. The maintenance of the true march remains a joint liability.

(ii) Of the above length nearly all the fencing on the original Durris acquisition is 20 years old or more, and is being kept up by extensive patching. The length of fencing nearing the end of its span is 51.5 miles.

(iii) There are 3 miles of shared march stock fence.

(iv) Unfenced plantations with march dykes have a total perimeter of 6 miles, this length not being included in (i) above.

The following table shows the position:-

Fences maintained solely by the Forestry Commission

Wood	Chains	Wood	Chains
Mulloch	250	Brought Forward/	2625
Garrol	285		
Cairnhill E and W	85	Monthammock	55
North Brae	240	Bruntyairds	75
Balbridie	140	Rickarton	230
W. Balbridie	40	Craigiedaff	175
Cairnfauld	85	Hilton/Brachmont	205
Crossroads School	35	Curracksstane)	
Funach	350	Ashentilly)	340
Funach North	35	Warren)	
Manse Nursery	30	Clune	155
Free Church	115	Craiglug	140
Meikledams	70	Craiglug North	25
Balladrum	135	Parkhead (part)	35
Kirkton	100	Maryculter	175
Woodlands	115	Auchlunies North	100
Slug	115	" central N (part)	30
Mundernal	140	" " S (part)	20
Target	120	Clochandighter)	130
Meikle Tulloch	25	Redmyre)	
Strathie	115	Duff's Hill	125
Carry Forward/	2625	Carry Forward/	4640

Wood	Chains	Wood	Chains
Brought Forward/	4640	Brought Forward/	5570
Duff's Hill Farm	70	Baads	165
Craigton/Kilduthie	305	Newmillhill	240
	80	Durris 3 (Roadside)	70
	75	Banchory Devenick N	50
	120	" " S	100
Collonach	140	Cairnshee (part)	30
Leuchar	140		
Carry Forward/	5570	Grand Total	6225

March Fences Shared

Wood	Chains
Park Bridge	25
Strathgyle (Murphy's Bog)	45
Eddieslaw	50
Parkhead (part)	35
Auchlunies Central N (part)	25
" " S (part)	45
Kilduthie SE	15
Grand Total	240

Unfenced perimeters

Wood	Chains
Cairnshee (part)	145
Barns	65
Sunnyside	117
Cairnieburn	76
Auchlunies (part)	80
Grand Total	483

Total Forest perimeter =

(1)	Fences maintained solely by the Forestry Commission	= 6225 chains	
(2)	March fences shared	= 240 "	
(3)	Unfenced perimeters	= 485 "	
		6950 "	= 87 miles

2. Restrictive Covenants, Reservations etc.

The following are the most important reservations the Forestry Commission is bound to recognise:-

(i) Banchory Devenick. Prince Consort's monument and access thereto.

(ii) Banchory Devenick. Hardwoods in areas shaded brown on Disposition map, also one Scots pine tree in position marked X. These are to be removed within a year of issue of felling licence.

(iii) Auchlunies. Policy hardwoods in areas shaded brown on Disposition map are not to be felled within ten years of date of entry.

(iv) Auchlunies. Access to Clochandighter reservoir in favour of Kincardine County Council. The Glen Dye Water Scheme will further affect this hill.

(v) Cairn-mon-Earn. A corridor 12 chains wide, 60 acres in extent, in favour of North of Scotland Hydro Electric Board, giving access to wireless station.

3. Easements, Servitudes and Licences

(i) Durris Estate. General servitude rights of access to the Forestry Commission exist over all existing tracks.

(ii) Banchory Devenick. The right is reserved to the Forestry Commission to take water from the quarries for fires, provided this is replenished.

(iii) Craiglug. The Forestry Commission was given the right (by Grant of Servitude 31.3.58) to build an access road over Tilbouries land at Craiglug Farm. In return the Forestry Commission allows the use of a plot of land below their road as a piggery, at the farm.

(iv) All specific accesses are shown on Disposition Maps.

4. Public Rights of Way

Public Rights of Way are believed to exist over the following routes, though they are rarely exercised:-

(i) Banchory Devenick. Path shown blue on Disposition Map and lettered AB.

(ii) Maryculter - Polston Farm.

(iii) Hillhead - Bruntyairds - Bawdy Craig.

(iv) Kirkton of Durris - Little Tulloch via Kirkton Wood.

5. Sporting Interests

The following table lists the shooting tenants:-

W.P. 10 Ref.	Property	Shooting Tenant	Period of Lease (years)	Let From	Rent p.a.	Remarks
1	Durris No. 1	Trustees of A.G. Johnson	5	28. 5.60	£50	Craiglug, Warren, Ashentilly and Currackstane Woods only retained by Trs. of A.G. Johnson
1	" No. 1	Viscount Cowdray	5	28. 5.60		Assigned to Cowdray by Johnson's Trustees.
15	Durris No. 3	" "	25	28.11.60	£10	" " " " " "
12	Durris No. 2	Durris Estates Ltd.	25	26.11.59	1d.	
2	Maryculter	W. M. Smith	5	2. 2.58	£10	
3	Crathes (Kilduthie)	Trs. of Maj. Gen. J.L.G. Burnett of Leys.	25	16. 1.52	£1	Agreement on Blackhall Forest acquisition.
5	" (Collonach)	Trustees of Col. H. A. Foster	25	16. 1.52	Nil	Let back by endorsement on Blackhall lease.
6	" (Craigton)	Trs. of Maj. Gen. J.L.G. Burnett of Leys.	25	5. 1.57	1d.	
4	Drum Estate	H. Q. Forbes Irvine	25	20. 5.54	£1	
7	Parkhead Farm	In hand				
8	Banchory Devenick	D. Stewart	25	6. 9.54	1/-	
9	Duff's Hill	H.W. Fulford & G. Peter	25	11.11.58	1d.	
11	Auchlunies	Capt. P. Duguid	25	15. 5.59	1d.	
14	Redmire Farm	In hand.				
16	Cairnieburn	In hand.				

Chapter 5. Amenity

(a) Description of Amenities

The patchwork form of forest blocks scattered widely across an arable landscape presents an attractively varied pattern to the scenery of Lower Deeside. The drab uniformity of heather-clad slopes rising to the south shows a pleasing variation where merging shades of spruce, pine and larch are now seen.

From the upper margins of the forest, at the Mulloch and Slug Woods, and on Cairn-mon-Earn, there are fine views up the Dee valley to the distant Cairngorms, or northwards to Benachie and the rolling farmlands of east Aberdeenshire. Some of the routes listed in Chapter 4 para. 4 above give access to the walker to such viewpoints.

There are several stone circles of Neolithic Age in or near the forest, two notable examples in clearings being in Mulloch and Clune Woods. Giant cairns of ancient origin are frequent, that of Cairnshee being notable. At Berry Hill, on the southern flank of Hill of Fare is the Queen's chair, where Mary Queen of Scots is said to have awaited news of the outcome of the Battle of Corrichie, in which her forces were engaged. Below, beside the public road, the Deeside Field Society recently erected a granite obelisk to commemorate her victory. The stone stands within the forest at Kilduthie.

(b) Policy and Existing Obligations

It is aimed to preserve viewpoints by a planting layout that will not close a vista with increasing tree growth. Both public and forest roads will, where suitable, have amenity planting adjacent to them, using attractive flower- or leaf-bearing hardwoods, such as gean, laburnum, Red oak or Norway maple. Such planting may also be used within the plantations where soil conditions permit good development.

No obligations to local or national bodies are recognised.

(c) Measures Adopted

Hardwood groups have been planted within conifer plantations on a small scale, but currently with little visible success.

Amenity planting on fringes or roadsides has been largely of sycamore as being the hardwood species most likely to succeed. Earlier plantings at Balbridie, Strathie and Craiglug show great vigour and attraction. Present work is concentrating on this species.

Underplanting of poor hardwoods or partially failed conifer crops is primarily a silvicultural operation, but its contribution to the attraction of the forest is important. A start has been made in areas ready for treatment, and this will extend through most larch plantations in the course of the next twenty years.

Forestry Commission

Form WP 4

Summary Statement of Growing Stock

as at 30.9.1961.

Working Plan Area Durris

Complete as necessary
Section
Working Circle
Felling Series

000's

Type (1)		Area (acres) (2)	Volume (h. ft.) (3)	Current Annual Increment (h. ft.) (4)
High Forest	Coniferous	4589*	992	110
	Mixed	Nil		
	Broadleaved	46	-	-
Total High Forest		4635*	992	110
Coppice with Standards		Nil		
Coppice		Nil		
Partially Felled		Nil		
Reserved Timber		Nil		
Scrub		37		
Felled		185		
Other Plantable		1172		
Other Land		616		
TOTAL		6645*	992	110

* including 22 acres pre-entry

Signature P. McIntyre

Date of Compilation 20.4.61

DS 39872/1/2572 7500 2/59 DL

Forestry Commission

Form WP 5

Area Statement of Growing Stock as at 30.9.1961

Working Plan Area Durris

Complete as necessary { Section / Working Circle / Felling Series

Delete as necessary { High Forest—Main Storey / ~~High Forest—Subsidiary Storey~~ / ~~Coppice~~

Areas in acres

Species (1)	Over- or Under-storey (2)	Even-aged 1966 1970 (3)	1961 1965 (4)	1956 1960 (5)	1951 1955 (6)	1946 1950 (7)	1941 1945 (8)	1936 1940 (9)	1931 1935 (10)	1926 1930 (11)	1921 1925 (12)	1901 1920 (13)	1881 1900 (14)	1861 1880 (15)	1841 1860 (16)	Pre 1841 (17)	Uneven-aged Pre 1900 (18)	Post 1900 (19)	† Pre and Post 1900 (20)	Total (21)
J.L.			6	95	136	88	94	133	35	Nil	10									597
E.L.				Nil	9	2	49	48	14	Nil	10									132
S.P.			5	100	112	21	211	22	Nil	Nil	114									585
N.S.				27	22	83	94	207	147	Nil	18									598
S.S.			42	25	22	270	166	310	181	Nil	12									1,028
S.S./S.P.				Nil	39	456	56	1	Nil	Nil	Nil									552
S.S./P.C.			96	115	Nil	25	Nil	Nil	15	Nil	Nil									251
J.L. or S.S./E.L.				10	7	Nil	1	Nil	1	Nil	Nil									19
J.L. or N.S./E.L.				3	28	Nil	Nil	Nil	Nil	Nil	Nil									31
D.F.				75	44	50	46	Nil	5	Nil	2									222
P.C.			90	44	9	5	Nil	3	17	Nil	Nil									168
L.C.				7	Nil	Nil	Nil	Nil	Nil	Nil	1									8
S.P./E.L.				80	186	48	4	Nil	Nil	Nil	Nil									318
E.L. or C.P./J.L.			1	20	Nil	Nil	Nil	Nil	Nil	Nil	Nil									21

† Uneven-aged crops in which pre P.1900 and post P.1900 age groups each occupy at least 20% of the canopy.

Signature P. McIntyre

Date of Compilation 19.4.61

2572. Wt.P.69260. 10,000. 4/59. C.P.C49211. Gp.773.

Forestry Commission

Form WP 5

Area Statement of Growing Stock as at 30.9.19 61

Working Plan Area Durris

Complete as necessary { Section / Working Circle / Felling Series

Delete as necessary { High Forest—Main Storey / High Forest—Subsidiary Storey / Coppice

Areas in acres

Species (1)	Over- or Under-storey (2)	Even-aged 1966 1970 (3)	1961 1965 (4)	1956 1960 (5)	1951 1955 (6)	1946 1950 (7)	1941 1945 (8)	1936 1940 (9)	1931 1935 (10)	1926 1930 (11)	1921 1925 (12)	1901 1920 (13)	1881 1900 (14)	1861 1880 (15)	1841 1860 (16)	Pre 1841 (17)	Uneven-aged Pre 1900 (18)	Post 1900 (19)	† Pre and Post 1900 (20)	Total (21)
S.P./J.L.				Nil	Nil	Nil	Nil	7	Nil	Nil	Nil									7
Miscellaneous Species			7	27	6	Nil	1	Nil	Nil	Nil	5									46
H/DW.			2	8	4	Nil	18	6	1										7 age not known	46
HL.			6																	6
												Total Area High Forest								4,635*
												* including 22 pre-entry								

† Uneven-aged crops in which pre P.1900 and post P.1900 age groups each occupy at least 20% of the canopy.

Signature P. McIntyre

Date of Compilation 19.4.61

2572. Wt.P.69260. 10,000. 4/59. C.P.C49211. Gp.773.

Forestry Commission

Form WP 6

Area Analysis by Quality Class as at 30.9.19 61.

Working Plan Area Durris * Working Circle

*Section * Felling Series

*Complete as necessary

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class I (3)	II (4)	III (5)	IV (6)	V (7)	below V (8)	Not Classifiable (9)	Total Area (10)	Remarks (11)
J.L.	21-25			1	9				10	
	26-30								Nil	
	31-35			14	21				35	
	36-40		17	45	46	25			133	
	41-45			29	34	4	27		94	
	46-50				19			69	88	
	51-55							136	136	
	56-60							95	95	Total area J.L. 597
	61-65							6	6	
E.L.	21-25				10				10	
	26-30								Nil	
	31-35			5	9				14	
	36-40			11	20	7		10	48	
	41-45		3					46	49	
	46-50							2	2	
	51-55							9	9	
	56-60								Nil	Total area E.L. 132
S.P.	21-25		6	86	22				114	
	26-30								Nil	
	31-35								Nil	
	36-40							22	22	
	41-45							211	211	
	46-50							21	21	
	51-55							112	112	
	56-60							100	100	Total Area S.P. 585
	61-65							5	5	

Signature

Date of Compilation

DS 39872/2/2572 10m 2/59 DL

Forestry Commission

Form WP 6

Area Analysis by Quality Class as at 30.9.1961.

Working Plan Area Durris * Working Circle

*Section * Felling Series

*Complete as necessary

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class I (3)	II (4)	III (5)	IV (6)	V (7)	below IV (8)	Not Classifiable (9)	Total Area (10)	Remarks (11)
N.S.	21-25			2	14		2		18	
	26-30								Nil	
	31-35		1	66	3		23 54		147	Checked crops.
	36-40		13	41	2		37	114	207	Checked crops.
	41-45						2	92	94	Checked crops.
	46-50							83	83	
	51-55							22	22	
	56-60							27	27	Total area N.S. = 598
							Below V			
S.S.	21-25					12			12	
	26-30								Nil	
	31-35				18	56	23 84		181	Checked crops.
	36-40		1	10	51	4	72 40	132	310	Checked crops.
	41-45			1			44	121	166	Checked crops.
	46-50							28 242	270	Checked crops.
	51-55					391	5	22	22	
	56-60							25	25	Total area S.S. 1,028
	61-65							42	42	
D.F.	21-25					2			2	
	26-30								Nil	
	31-35							5	5	
	36-40								Nil	
	41-45					7	6	33	46	Checked crops.
	46-50						15	35	50	Checked crops.
	51-55							44	44	
	56-60							75	75	Total area D.F. 222

Signature P. McIntyre

Date of Compilation 19.4.61

DS 39872/2/2572 10m 2/59 DL

Forestry Commission

Form WP 6

Area Analysis by Quality Class as at 30.9.1961.

Working Plan Area Durris * Working Circle

*Section * Felling Series

*Complete as necessary

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class I (3)	II (4)	III (5)	IV (6)	V (7)	below V (8)	Not Classifiable (9)	Total Area (10)	Remarks (11)
SS/SP	36-40							1	1	
	41-45							56	56	
	46-50							456	456	Total Area 552
	51-55							39	39	
SP/EL	41-45							4	4	
	46-50							48	48	
	51-55							186	186	
	56-60							80	80	Total Area SP/EL 318
P.C.	31-35							17	17	
	36-40							3	3	
	41-45								Nil	
	46-50							5	5	
	51-55							9	9	
	56-60							44	44	Total Area P.C. 168
	60-65							90	90	
CP/EL or JL	56-60							20	20	Total Area CP/EL or JL 21
	61-65							1	1	
SS/PC	31-35							15	15	
	36-40								Nil	
	41-45								Nil	
	46-50							25	25	
	51-55								Nil	
	56-60							115	115	Total Area SS/PC 251
	61-65							96	96	
L.C.	21-25							1	1	
	26-55								Nil	
	56-60							7	7	Total Area LC 8

Signature P. McIntyre

Date of Compilation 19.4.61

DS 39872/2/2572 10m 2/59 DL

Forestry Commission

Form WP 6

Area Analysis by Quality Class as at 30.9.1961.

Working Plan Area Durris * Working Circle

*Section * Felling Series

*Complete as necessary

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class I (3)	II (4)	III (5)	IV (6)	V (7)	below V (8)	Not Classifiable (9)	Total Area (10)	Remarks (11)
NS/JL or EL	51-55							28	28	
	56-60							3	3	Total NS/JL or EL 31
SP/JL	25&40			7					7	Total Area SP/JL 7
SS/JL or EL	31-35						1		1	Checked crops.
	36-40							1	1	
	40-50								Nil	
	51-55							7	7	
	56-60							10	10	Total Area SS/JL or EL 19
H/DW	Pre 30							7	7	
	31-35							1	1	
	36-40							6	6	
	41-45							18	18	
	46-50								Nil	
	51-55							4	4	
	56-60							8	8	Total Area H/DW 46
	61-65							2	2	
Miscellaneous Species	21-25							5	5	
	41-45							1	1	
	51-55							6	6	
	56-60							27	27	Total Area Misc 46
	61-65							7	7	
HL.	61-65							6	6	Total Area = 6

Signature P. McIntyre

Date of Compilation 19.4.61

DS 39872/2/2572 10m 2/59 DL

Forestry Commission Form WP 9

Volume Statement of Growing Stock as at 30.9.1960.

Working Plan Area Durris

Complete as necessary: Section ..... Working Circle ..... Felling Series .....

Volumes in 000s hoppus feet

Species or Species Groups (1)	"p" Year Class (2)	Volumes by Size Classes (B.H.Q.G.) 2½-6" (3)	6½-9" (4)	9½-12" (5)	12½-15" (6)	15½-18" (7)	18"+ (8)	Total Volume 000 H.ft. (9)	Precision (10)	Current Annual Increment 000s H.ft. (11)
J.L.	21-25	10	3					13		1
	31-35	42	14					56		4
	36-40	129	14					143		17
	41-45	65	-					65		7
	46-50	11	-					11		-
J.L. Total		257	31					288		29
E.L.	21-25	7	2					9		1
	31-35	5	2					7		1
	36-40	18	-					18		2
	41-45	1	-					1		-
E.L. Total		31	4					35		4
S.S.	21-25	29	25	2				56		6
	31-35	104	44	1				149		18
	36-40	81	15	-				96		16
S.S. Total		214	84	3				301		40
N.S.	21-25	15	6					21		2
	31-35	86	3					89		10
	36-40	63	-					63		7
N.S. Total		164	9					173		19
S.P.	21-25	131	41					172		15
S.P. Total		131	41					172		15
D.F.	21-25	4	1					5		-
	31-35	5	-					5		1
	41-45	5	-					5		1
D.F. Total		14	1					15		2
L.C. Total	21-25	1						1		-
Mixture S.P.			3					3		1
Mixture J.L.		3	1					4		
SP/JL Total		3	4					7		1
Grand Totals		815	174	3				992		110

Signature P. McIntyre Date of Compilation 1.5.61

DS 39872/3/2572 10m 2/59 DL

Chapter 6. Growing Stock

(a)-(d) See W.P. forms.

(e) Enumeration Methods

The standing volume of each sub-cpt. was assessed by use of Relascope, Haga hypsometer, and by alignment charts. Each classifiable sub-cpt. was given a Quality Class from the mean top heights so obtained and the age of the crop.

To check these volumes and to get the proportion of volume in each quarter girth class for the completion of Form W.P. 9, 1/10 ac. sample plots (one in 20 acres having volume) were selected at random and measured.

The basis of measurement was the Tariff Table Method. The B.H.Q.G.s of all trees were taken. Instead of felling sample trees the volumes of 10 random trees per plot were obtained from top height and B.H.Q.G. and the General Volume Tables. The appropriate Tariff Table No. was calculated and the volume of the plot obtained in the usual way.

Each plot was given a Quality Class from the top height and age, and the C.A.I. read off from the Yield Tables.

Estimation of increment has provisionally been derived from Yield Table data for the Quality Classes identified. Indicator plots have been laid down for J.L. and S.S. and one for N.S. is planned, and as these yield data, future increment forecasts will be based on them.

(f) Description of Growing Stock

The forest is composed of coniferous high forest.

Sitka spruce is the most widely used species since the earliest Forestry Commission planting in 1932. It is so ubiquitous that wide quality variation is expected. Much is still below classification, qualifying stands ranging from Q.C. III-V, with an average Q.C. IV. Sites vary greatly from peaty gley to glacial drift, and although some of the earlier planting was on grassland the species appears commonly on heather moor, sometimes alone, or on harder sites mixed with Scots pine. In such cases it is noteworthy that it is usually growing considerably better than the nurse, though the reverse can also be seen where little progress has been made against the heather.

The best growth in Sitka is on the steep slopes of dens or on shallow peat over boulder till.

Norway spruce is used to a minor extent, averaging Q.C. III in a range from Q.C. II-IV. Its more regular growth reflects its more careful siting to old arable grass and juncus flushes.

Japanese larch has been confined to moderate well drained slopes, where it produces an average Q.C. IV in the range II-V.

Only 16% of the total planted acreage of 4,635 is productive. This is reflected in the total of only 777 acres to which a quality class can be allocated.

(g) Seed Origins

Outstandingly good strains are seen in:-

Chapter 6 Para. (g)

Species	Wood	Compt. and sub.compt.	P. Yr.	I.D. No.
S.S.	Monthammock	70a	33	28/43
"	"	73a	"	28/43
"	Strathie Burn	64c	"	28/43
"	Maryculter	143c	38	34/38 33/13
"	Funach	37a	39	34/38
N.S.	Slug	48b	32	27/50
"	"	49e	"	27/50
"	Meikle Tulloch	59a	36	32/23
J.L.	Ashentilly	105d	40	37/232

Chapter 7. Organisation

(a) Previous Plans

There have been no previous Working Plans. Work has been regulated by five year Plans of Work covering the main operations, planting, ploughing, drains upkeep and thinning.

In F.Y. 53 a Thinning Plan, that had been drawn up in the previous Forest Year, was put into operation. Almost immediately, however, the hurricane of January 1953 destroyed over a quarter million cubic feet of standing timber, and the Plan was perforce suspended. By the time it could be resumed the schedules were obsolete. The present plan is the first revision. The earlier work was based on Relascope sweeps to assess Basal Areas in stands ready for thinning, increment and yield being drawn from Revised Yield Tables for the appropriate Quality Classes.

Thicket-stage stands not ripe for thinning were assessed for current top height and annual height growth, from which the interval to first thinning was estimated, using the average heights at which this took place, from Yield Tables.

Although the Thinning Plan was scarcely launched, it is possible to compare some of the forecast quantities with actual output, with the following general conclusions:-

1. Relascope sweeps gave reasonably accurate B.A. assessments: volumes derived fromthese were slightly below those actually standing.

2. Thinning volumes forecast were generally lower than those obtained, even allowing for delay in thinning due to windblow clearance.

3. The anticipated start of thinning in youngstands was often later than growth demanded.

4. The wide variation in growth rates on adjacent sites made highly problematic the actual definition of an area due for thinning a number of years ahead. This problem is no nearer to a solution in the present plan, and sub-compartment boundaries can often be only an intelligent guess at the expected future progress of a stand varying in height at the time of assessment from 5-35 feet.

(b) Administrative Subdivisions

1. Districts. Durris Forest is the most easterly of the six forests in the Deeside and Upper Strathdon District.

2. Forests. This plan relates solely to Durris Forest.

3.) 4.) The forest is not divided into Sections or Beats.

5. Working Blocks. There are three, woods being allocated as follows:-

Block A	B	C
Garrol	Clune	Woodlands
Mulloch	Monthammock	Strathie/Pitcowdens
Cairnshee	Denside	Target
Cairnhill	Craigiedaff	Mundernal
North Brae	Strathgyle/Bruntyairds	Slug
Balbridie	Bawdy Craig/Cairn-mon-Earn	Kilduthie/Craigton
West Balbridie	Brachmont/Hilton	Collonach
Barns	Curracksstane	Leuchar
Funach	Ashentilly	Baads
Crossroads	Warren	
Cairnfauld	Craiglug	
Sunnyside	Kinclune	
Balladrum	Maryculter/Parkhead	
Free Kirk	Newmillhill	
Kirkton	Banchory Devenick	
	Auchlunies	
	Duff's Hill/Duff's Farm	
	Cairnie burn	

6. Compartments have been designed with an average area of around 35 acres, though this may vary from 20 to 50 acres, depending on the uniformity of terrain and vegetation.

(c) Management Subdivisions

1. Working Circles
2. Felling Series
3. Cutting Sections

None proposed.

4. Sub-compartments

Sub-compartment boundaries are identified by one or more of the following features:-

(i) Distinguishable areas greater in extent than 0.5 ac.

(ii) Change of species.

(iii) A significant change in height e.g. one part of a stand in thinning stage, merging into an area just closing canopy. The boundary between such areas is arbitrary. The only purpose in establishing it is the more accurately to assess total thinning acreages. Such boundaries will alter or disappear at plan revision.

(iv) Age difference, if this is of the same order of significance as described in (iii) above.

Chapter 8. Planting Rate and Resumption of Land

(a) Planting

P.Yr.	Ac.	P.Yr.	Ac.	P.Yr.	Ac.
32	101	42	208	52	43
33	100	43	157	53	86
34	109	44	122	54	75
35	100	45	82	55	270
36	94	46	123	56	210
37	102	47	141	57	101
38	150	48	250	58	73
39	158	49	240	59	71
40	205	50	311	60	125
41	218	51	210	61	222

Chapter 8 Para. (a)

Considerable transfers in ownership of neighbouring land have occurred in the past two years, from which extra territory has been acquired along the south march. But sporting and grazing interests are now more firmly entrenched than ever on the large areas of moorland still marching with the forest. The owners will have little inclination to dispose of their property in the foreseeable future, and further expansion must be by paltry additions.

(b) Resumption

Reserves of plantable land stand at 1,394 acres, which at the present high rate of planting will be exhausted in F.Y. 66. All reserves are in hand.

Chapter 9. Silvicultural Systems

(a) General

The silvicultural system, if such a term is appropriate, has amounted to the speedy afforestation or re-afforestation of all plantable land available in large evenaged blocks, divided into compartments, which in the early years were laid out on the grid pattern. The forest has now been re-compartmented using roads and roadlines approved by the Conservancy Engineer as compartment boundaries wherever possible.

(b) Thinning

Thinning began in Forestry Commission planted woods twelve years ago.

Most of the thinning of Forestry Commission woods has been done in Japanese larch and spruce. Japanese larch is growing mainly on good sites of better than average fertility, and the aim is to prepare them for early underplanting with Douglas fir, Norway spruce and other shadebearers. Sitka spruce and Norway spruce areas have been coming into the thinning stage rapidly in recent years.

The aim of our thinning has been to produce high quality straight grained saw timber with small branches. This aim may well have led us in the past to be too rigid in our treatment of wolf trees and, either this inflexible treatment, or the too late application of it has probably caused some windblow. Our aim remains the same, but first thinnings are being done some three years earlier than heretofore and we now adopt a less rigid attitude to wolf trees.

The type of thinning now practised aims at maintaining as far as is practical, the natural canopy structure, by removing wolf trees at an early date, before the crop is at a stage subject to windblow; by leaving, where they have a chance to develop, all small trees; and by accepting in the crop a proportion of otherwise undesirable big rough trees for the sake of stability.

Another important feature of our present thinning policy is to maintain stable margins on the forest boundaries and also on the compartment and sub-compartment boundaries, by thinning early and heavily to the benefit of the most vigorous trees of whatever form.

Thinning has been repeated at three yearly intervals, but the emergence of Sitka spruce from check in groups over a wide area has led this year (F.Y. 62) to essential first thinning in all thinning blocks. Scots pine stands are normally thinned every six years.

(c) Felling

Apart from small wartime felling of acquired wood, felling has been confined to the clearing of windblows and to felling of remnants left after the gales of 1953 and subsequent years. Some group felling has been carried out in recent years, mainly in poor Scots pine crops. Holes have been created by clearing areas of poor stocking, inferior form or windblow. This has been done as thinning has been due in the stands.

Chapter 10. Crop Establishment

(a) Choice of Species

Durris Estate had a reputation for growing Sitka spruce and Douglas fir, dating from the planting of the mid-nineteenth century. This guided the foresters in their choice of species in the early Forestry Commission planting of the 1930s.

Douglas fir was used with some regard for its site requirements, so that it is growing well. The few patches of Blue Douglas have now been removed in a diseased state.

Sitka spruce was widely planted over moorland, often pure, sometimes in line mixture with Scots pine. Form varies widely from crooked stem with coarse branching to straight cylindrical columns with finest branching.

Japanese larch has been planted in pure blocks on fertile grass or bracken slopes, though on heather too with ploughing. Growth has usually been fast, though here too with variable form.

Present planting reflects the mainly calluna and scirpus moor sites that are at our disposal. Sitka spruce is used as widely as the water status of the site will permit. Its mixture with Pinus contorta, is flexible, ranging from occasional Sitka groups in a dominant area of the pine to an equal and intimate mixture with it.

Norway spruce is used to a lesser degree on carefully selected flushes free from heather competition.

Douglas fir is used on the few sheltered sites of high fertility available, and also, with Abies grandis, nobilis and Norway spruce, in underplanting larch areas.

Japanese larch is used to a very small degree for fire belts.

Scots pine is not now widely planted, although its extensive use as a nurse to Sitka spruce results in it occupying 28% of the planted area, second only to Sitka spruce itself. There are no stands of the species of good quality, and most of the mixtures are expected to become predominantly Sitka spruce.

Recent Scots pine planting has been with a 15' x 15' dilution of European larch.

Pinus contorta was planted on a very small scale prior to F.Y. 56. Since then 134 acres have been planted pure. There are as yet no stands in the forest having a measurable volume.

(b) Preparation of Ground

After fencing against rabbits and hares, all areas are ploughed whenever the site permits. Only extensive large boulders or rock outcrops, or the presence of recently-felled large tree roots, prevent ploughing. Tining hard ground, and drain-ploughing soft or wet sites are the normal practices. The aim with the former is to break up the maximum depth of subsoil whilst turning out the shallowest possible turf. Recent experience cast grave doubts on the wisdom of planting pines in the tined furrow. This has been largely abandoned except where the soil is deep and fertile and the present practice of planting through the slice calls for a heavier furrow than was thought necessary in the early days of tine ploughing and furrow planting. Tine ploughs being used at present provide a suitable slice. Drain ploughing turns out the maximum thickness of turf and provides a drainage channel to lower the water table.

Sites too boggy to plough require hand draining and mounding.

(c) Planting methods

Current tine ploughing is of impoverished gravels beneath a thin layer of fibrous peat. Rooting in this medium is along the furrow and ascending at an early stage to the peat layer below the slice, and rarely across the tined furrow.

This has led to great instability, to overcome which planting of such sites is through the top of the slice. Rooting in the rotting vegetative sandwich layer is achieved if plants are inserted right through this layer, and their subsequent search for nutrients in the shattered zones of subsoiling increases the chance of a more radial root development.

In fertile loams or gravels of good vertical drainage this problem does not arise. Plants are here inserted in or beside the subsoiled trench, the latter position giving less competition in the rooting layer.

In drain ploughing the position of the plant is on top of the slice, to give maximum root aeration and freedom from competition, for such sites usually experience abundant grass invasion after ploughing.

Hand drained areas are planted right through the large turfs that have been turned out at planting distance as the drains were cut.

Areas too hard to plough are screefed by hand and the plant inserted in a vertical notch made by Schlich spade. This is the normal planting tool except on drain-plough furrows, where the garden spade is used.

In underplanting, the overhead shade is thinned in advance of planting to allow sufficient light for the establishment of the undercrop. Depending on the value of the canopy, planting may be:-

1. overall, at normal spacing, if the canopy is of poor form and to be retained only so long as shelter is needed.

2. in groups, if it is desired to preserve pure areas of the canopy for later removal along with thinnings from the undercrop.

The first method restricts one to the use of shade-bearing species. More light-demanding species may be used in the second, provided the groups are confined to the centre of openings, and these made big enough to eliminate side shade.

Underplanting is done with a small screef and vertical notch by Schlich spade.

(d) Weeding

The protective role of weed species against sun scorch is borne in mind in periods of heat and drought.

(e) Beating up

When a site can support it, any necessary beating up is used as an opportunity to introduce a new species.

Chapter 11. Crop Maintenance

(a) Fencing

See Chapter 4 (d) 1. (i)-(iv).

Much of the fencing around thicket stage plantations is old and requires regular patching. With the threat of invasion of ground vermin from adjoining rough land these fences can not yet be abandoned. The present patching policy is considered cheaper than wholesale renewal and it will be continued so long as the fence can support it. Beyond that point fences will be dismantled.

Many fences that will stand long enough with no pressure against them are threatened with collapse where march dykes have fallen into disrepair and stock has access to the plantation fence behind.

Chapter 11 Para. (a)

Present policy is to seek agreement with our neighbours for the joint repair of the worst of these marches, extending the work of renovation to all of them over the next few years.

(b) Cleaning

Cleaning is an operation little thought of applied to the removal of weed species from the canopy after its closure. If a species such as birch needs removal for the good of the crop it were best done at weeding. If a few birch or other hardwoods have competed so strongly as to attain the canopy they should be made welcome and provision made for their survival amidst the crop.

(c) Draining

Draining is organised on a block system, following the thinning blocks. Constant attention to the peaty spruce areas is necessary to maintain crop stability.

(d) Racking

The opening of inspection lines by brashing in areas shortly to be thinned allows access to trappers, and to assess the crop for thinning.

Lines are brashed along the contour at 3-4 chain intervals, and also at right angles.

This is useful hard weather work, affording shelter to those engaged upon it.

(e) Brashing

Brashing is done to give access for marking of thinnings and for the removal of thinnings. This has been done selectively in about 30% of the crop and has given adequate access for this purpose.

Trials are being carried out on Sitka spruce at the forest at present, to find what method is most economical. The trials include the brashing of the insides only of suitable dragging lines at various distances apart, and the brashing of dragging lines combined with the selective brashing of good individual trees on and between the lines.

The co-operation of contractors in assessing the economies of these trials is being sought.

(f) Pruning

Pruning of Scots pine and Douglas fir is being done on a small scale. It is done with pole saws to a height of about 16' in the first place, and may be extended up to 20' later.

Up to 150 trees per acre are selected. The work is done before first thinning if possible, but certainly before second thinning, which will be directed towards the best development of these chosen trees.

(g) Other operations

Nil.

Chapter 12. Crop Improvement

(a) Enrichment

Enrichment has been carried out on a small scale under Japanese larch which through a sequence of thinning has become sufficiently open to permit the introduction of an undercrop; or under European larch badly cankered and of poor form which has been deliberately reduced in stocking to allow enrichment by the removal of the worst cankered trees and those of poorest form. Earlier planting has been in groups, using Norway spruce.

Chapter 12 Para. (a)

Present treatment depends on the presence of any good stems, either singly, or in patches, as to whether the introduction is by groups or at standard spacing, with allowance for good stems where they appear.

Choice of species lies between Douglas fir, Norway or Sitka spruce, Abies nobilis and grandis. Small groups of hardwoods, mainly sycamore, and Norway maple, are planned in clearings.

(b) Rehabilitation

This is confined to the selection and pruning amongst birch clumps in an area where a conifer crop is being introduced in groups. It includes thinning out the heavy crowned rough trees to favour the finer straight-stemmed hardwood specimens, which are to be grown on with the younger conifer crop.

(c) Other Methods

A checked spruce area in heather has been sprayed experimentally with 2.4.D/ 2,4,5,T Weedkiller in order to promote growth in the crop. Early results are hopeful, and if economic the method could be applied to wide areas of check.

Forestry Commission

Record of Past Yields from Thinning/~~Felling~~

Form WP 13

Working Plan Area Durris

Volumes in 000's h. ft. over bark

Areas in acres

* Complete as necessary

* Section

* Working Circle

* Felling Series

Year	B.H.Q.G. Classes	Total		Species and Species Groups															
				Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Other B'leaved Species	
(1)	(2)	Volume (3)	Area (4)	Volume (5)	Area (6)	Volume (7)	Area (8)	Volume (9)	Area (10)	Volume (11)	Area (12)	Volume (13)	Area (14)	Volume (15)	Area (16)	Volume (17)	Area (18)	Volume (19)	Area (20)
59	Total	33	133	1		11	46	20	86	1	1								
	2½"—6"	28		1		9		18											
	6½"—9"	5				2		2		1									
	Over 9"																		
58	Total	33	122			16	65	17	57										
	2½"—6"	30				15		15											
	6½"—9"	3				1		2											
	Over 9"																		
57	Total	30	104			20	58	10	46										
	2½"—6"	24				15		9											
	6½"—9"	6				5		1											
	Over 9"																		
56	Total	73	258	18	99	19	54	33	97	3	8								
	2½"—6"	57		16		10		30		1									
	6½"—9"	16		2		9		3		2									
	Over 9"																		
55	Total	7	106	0.3		4		1		1				0.4		0.2		0.1	
	2½"—6"	4		0.3		2		0.7		0.3				0.4		0.2		0.1	
	6½"—9"	3				2		0.3		0.7									
	Over 9"																		

2572. Wt.P.69260. 15,000. 4/59. C.P.C49211. Gp.773.

Forestry Commission

Form WP 13

Record of Past Yields from Thinning/~~Felling~~

Volumes in 000's h. ft. over bark .....

Areas in acres .....

Working Plan Area Durris

* Complete as necessary

* Section ..... * Working Circle ..... * Felling Series .....

Year (1)	B.H.Q.G. Classes (2)	Total Volume (3)	Total Area (4)	Pines Volume (5)	Pines Area (6)	Spruces Volume (7)	Spruces Area (8)	Larches Volume (9)	Larches Area (10)	D.F. Volume (11)	D.F. Area (12)	Other Conifers Volume (13)	Other Conifers Area (14)	Oaks Volume (15)	Oaks Area (16)	Beech Volume (17)	Beech Area (18)	Other B'leaved Species Volume (19)	Other B'leaved Species Area (20)
60	Total	1	9			0.2												0.8	9
	2½"—6"	1				0.2												0.8	
	6½"—9"																		
	Over 9"																		
61	Total	47	254	7	33	22	123	16	98									2	
	2½"—6"	39.5		4		21		14										0.5	
	6½"—9"	7		3		1		2										1	
	Over 9"	0.5																0.5	
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		

2685. Wt. P79406. 10,000 4/60. C.P.C56583. Gp. 773.

Forestry Commission

Form WP 13

Record of Past Yields from ~~Thinning~~/Felling

Volumes in 000's h. ft. over bark .....

Areas in acres .....

Working Plan Area Durris

* Complete as necessary

* Section ..... * Working Circle ..... * Felling Series .....

Year (1)	B.H.Q.G. Classes (2)	Total Volume (3)	Total Area (4)	Pines Volume (5)	Pines Area (6)	Spruces Volume (7)	Spruces Area (8)	Larches Volume (9)	Larches Area (10)	D.F. Volume (11)	D.F. Area (12)	Other Conifers Volume (13)	Other Conifers Area (14)	Oaks Volume (15)	Oaks Area (16)	Beech Volume (17)	Beech Area (18)	Other B'leaved Species Volume (19)	Other B'leaved Species Area (20)
60	Total	1.4	1			0.5	1	0.1				0.2				0.6			
	2½"—6"	0.5				0.4		0.1											
	6½"—9"	0.1														0.1			
	Over 9"	0.8				0.1						0.2				0.5			
61	Total	28		3		18		4				2				1			
	2½"—6"	7		1		3		2				1							
	6½"—9"	13		1		10		2											
	Over 9"	8		1		5						1				1			
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		
	Total																		
	2½"—6"																		
	6½"—9"																		
	Over 9"																		

2685. Wt. P79406. 10,000 4/60. C.P.C56583. Gp. 773.

Forestry Commission

Form WP 13

Record of Past Yields from ~~Thinning~~/Felling

Volumes in 000's h. ft. over bark .....

Areas in acres .....

Working Plan Area Durris

* Complete as necessary

* Section ..... * Working Circle ..... * Felling Series .....

Year (1)	B.H.Q.G. Classes (2)	Total Volume (3)	Total Area (4)	Pines Volume (5)	Pines Area (6)	Spruces Volume (7)	Spruces Area (8)	Larches Volume (9)	Larches Area (10)	D.F. Volume (11)	D.F. Area (12)	Other Conifers Volume (13)	Other Conifers Area (14)	Oaks Volume (15)	Oaks Area (16)	Beech Volume (17)	Beech Area (18)	Other B'leaved Species Volume (19)	Other B'leaved Species Area (20)
				Species and Species Groups															
59	Total	6	4	1		2	2					3	2						
	2½"—6"	2		1		1						–							
	6½"—9"	4				1						3							
	Over 9"																		
58	Total	15	14	2	2	7	5	3	4			3	3						
	2½"—6"	11		2		4		3				2							
	6½"—9"	4				3						1							
	Over 9"																		
57	Total	40	12	8	1	17	6	5	3	9	2	1	–						
	2½"—6"	17		4		8		3		1		1							
	6½"—9"	23		4		9		2		8									
	Over 9"																		
56	Total	4	2	1	1	2	1	1											
	2½"—6"	3		1		2													
	6½"—9"	1						1				–							
	Over 9"																		
55	Total	6	5			4	3	1	1	1	1								
	2½"—6"	3				3													
	6½"—9"	3				1		1		1									
	Over 9"																		

2685. Wt. 979406. 10,000 4/60. C.P.C56583. Gp. 773.

Chapter 13. Regulation of the Yield

(a) See Form W.P. 13.

(b) Methods of Yield Regulation

Yield is regulated meantime by allocating to thinning blocks areas of roughly equal outturn. The entire planted area is provisionally allotted to one of the three blocks. As a new area enters the thinning arena it falls into place in the cycle. (See Chapter 7(b) 5. above).

Of the 1,500 acres of plantation over 20 years of age, less than one third is currently being thinned. This area may be expected to increase rapidly in the next decade, and a method that deals with the newly recruited stands on an area basis is considered the most flexible.

Chapter 14. Forest Roads and Access

(a) Construction

Total road system planned is 66.2 miles, of which 29.1 miles have been built.

All the main thinning areas have their extraction roads complete. The forest is adequately served by pre-planting and fire access roads.

Road intensity is based on the assumption that the maximum economic horse drag is 200 yards. Roading is planned to a final intensity of one mile per 80-100 acres of plantation. There is a total public road frontage of 18.3 miles.

Width of formation is 15 feet, metalling being to 10 feet.

Maximum ruling gradient is 1 in 10, which may be increased to 1 in 8 if unavoidable.

The minimum radius of curves is 45 feet to the centre line of the road, with corresponding increase in the width of the road.

Culverting is at the rate of about 15 to the mile, depending on the site. Minimum pipe diameter is 12".

It is aimed to provide eight passing places per mile of road.

Clearance of formation has been up to 45 feet for excavated roads, and frequently 40 feet for bulldozed formation. This is considered excessive, and is now limited to 40 feet for excavator, 30 feet for bulldozer.

Since Lochton gravel pit was worked out, no suitable road metal is available locally, and gravel is being run in from Blackhall Forest.

The following table shows the current costs of construction per mile of road:-

	Cost	Overheads	Total
Formation	£ 620	£225	£ 845
Metalling	590	220	810
Culverting	205	75	280
Total	£1,415	£520	£1,935

In addition a single 42 foot span prefrabicated concrete stressed-beam bridge cost:-

Chapter 14 Para. (a)

Labour	£145
Materials	384
P.V. & M.	125
Overheads	116
Total	£770

(b) Maintenance

Cleaning side drains, culverts and grading mechanically after thinning is the normal procedure, though the mechanical grader is not always available when required.

(c) Access

Access is everywhere adequate.

Chapter 15. Powered Vehicles and Machines

Machines held at the forest are:-

Ford Thames van, for supervision.
Trojan Personnel Carrier for transport of workers.

Both are efficient in their tasks. Maintenance is of three sorts:-

1. daily, exercised by the driver,

2. small emergency, supplied by local garage.

3. Major repair or attention, serviced at Blackhall Garage or by mechanics despatched thence.

The service provided by these sources is timeous and efficient.

Heavy equipment is available from Conservancy mobile sources, comprising

(i) Plough tractors and ploughs, trailing or hydraulically mounted.

(ii) Bulldozers and tractor-mounted shovels.

(iii) Excavators: face shovel or drag-line.

(iv) Tipping lorries.

Routine maintenance to these items is given, as laid down on schedules, by the operators. Major repair or maintenance is undertaken by mobile mechanics from Blackhall Garage, either on the spot or by removing the machine to the depot.

Plough repairs are handled by the Denside smithy if the part is removable in the field e.g. fractured draw bar or building up tine socks. Blackhall Garage handles repairs beyond local capacity, and Gunn, Aberdeen manufactures plough bodies.

An efficient, speedy service is given by these sources.

Chapter 16. Marketing and Exploitation

(a) Marketing

1. Standing Sales

Available outlets are:-

(i) Limited local market for fuelwood.

(ii) Small local demand for round stakes and stack props.

(iii) Fluctuating demand for round pitwood to Fife and Lothians and Central Midland coalfields.

(iv) Similar demand for sawn mining timber.

(v) Fairly steady market for box wood and city mill logs in Aberdeen, though currently at declining prices.

Present standing sales include material suitable for all the above markets, for which an overall price of around 1/6d. per hoppus foot overbark has been normal.

N.B. (The current sale contained a high proportion of first thinnings of Japanese larch suitable for pitwood only. Messrs. Fiddes, Aberdeen were offered the lot for sale by negotiation but declined to offer. It was subsequently advertised and attracted no offers. It was later sold by negotiation to Messrs. Timbuyers at 9½d. per H.ft. - 1962).

Each sale has been marketed separately by advertisement. The following merchants have in the past shown active interest:-

Wm. Fiddes, Aberdeen.
J. Cordiner, Aberdeen and Banchory.
G. Duncan, Potarch Bridge.
J. Fraser, Cambus O' May.

2. Commission Working

Commission working is not undertaken.

(b) Exploitation

1. Standing Sales

With the exception of wind damaged areas no clear felling coupes are worked. Thinning areas tend at the present stage to be scattered throughout each block. The area thinned annually is 150-200 acres.

Measurement is by Tariff. Stands are grouped, those with similar age and height, and of the same species, being measured by a common tariff number. A separate count of trees by compartments is maintained. This work is under the direct supervision of a forester under the surveillance of the Head Forester.

The Head Forester watches progress of each sale, keeping his eye on the contractor to ensure satisfactory workmanship and care of standing trees.

All stumps are creosoted against fomes annosus, pressure being constantly exerted to get this done as soon as possible after severance of the tree. This is a standard condition of sale, the work being done at the purchaser's expense, though with materials provided.

Pines felled during pine shoot beetle breeding season are to be completely peeled or removed from the forest within six weeks of cutting.

The lighting of fires is prohibited.

Two-phase extraction is normal with thinnings:-

(i) horse from stump to roadside

(ii) lorry from road to mill.

A loading bank is usually sought to aid hand loading.

Heavy timber felled in clear cutting has on occasions been extracted by lorry-mounted crane, this being used also to load.

Forest conversion is at small dumps at roadside, and is confined to cross-cutting to pitwood and boxwood sizes.

2. Commission working

Commission working is not undertaken.

(c) Observations on the relative merits of Standing Sales and Departmental Working

Numerous Conservancy ad hoc costing trials have established that standing sales are more remmerative than departmental working.

Chapter 17. Risks

(a) Animals

1. Red deer are uncommon.

2. Roe deer make the forest their home, and constant vigilance is needed to hold their numbers at a level to permit normal forestry to be pursued.

3. Brown hares are frequent on the moorland areas but are kept to a low level within plantations.

4. Rabbits are numerous on adjoining rough land. Plantations are meantime commendably clear of them.

5. Voles are a periodic source of damage on grassy sites, causing heavy loss in young plantations in years of high population.

(b) Birds

1. Capercaillzie are frequent in woods over 30 years old. Their numbers are controlled.

2. Blackgame have not been recognised as a serious menace, though new moorland planting on Bawdy Craig suffered quite extensively from their feeding on pine areas in the winter of 1960/61.

(c) Insects

1. Serious defoliation is caused to Sitka spruce in some years by Neomyzaphis. Trees affected suffer temporary loss of vigour through defoliation; no deaths from this cause have been seen.

2. Spruce-gall aphid (Adelges viridis) attacks Norway spruce areas periodically, causing extensive defoliation after a bad attack, and distorting branches. It has rarely caused death, though a weakened tree may succumb. Loss of growth is temporary through foliage reduction.

3. Pine sawfly (Diprion pini) attack on young pine areas has been occasional and sometimes quite heavy.

Chapter 17. Para. (c)4

4. Pine shoot beetle (Myelophilus piniperda) caused considerable damage to remaining pine following the delay in clearing windblow after the gale of 1953. Normally the usual precautions prevent serious damage.

5. Pine Weevil (Hylobius abietis) has not given serious trouble. Trapping, and dipping of plants are carried out where necessary.

(d) Weeds

Heather suppression by 2, 4-D 2,5-T chemical spray (Spontox) has been applied experimentally in an area of checked Sitka spruce in Clune Wood. (See Chapter 21(b)).

(e) Fungi

1. Fomes annosus is widely present on all old woodland sites. Creosoting stumps at thinning or felling is now normal practice throughout the forest.

Choice of species on the worst of such sites now tends to an avoidance of larch, and a selection of Douglas fir if suitable, or Sitka spruce in preference to Norway spruce, as giving a greater volume before rot overtakes increment.

(f) Climate

The eastern blocks of the forest lie close to the North Sea coast, and salt-laden winds are inimical to healthy tree growth and preclude the use of Scots pine in these regions.

(g) Trespass

No damage is experienced.

(h) Atmospheric Pollution

Atmospheric Pollution is unknown.

(i) Fire

Fire risk is normal, being offset by the many blocks of woodland surrounded by arable ground. The highest risk is from the extensive moorland along the south march, and this is being sealed off by screefed earth bands to prevent fire entering.

Chapter 18. Nurseries

There is no nursery at Durris, plant supplies being allocated from

Newton)
Ledmore) nurseries in East Scotland Conservancy
Blackhall)

and to a minor degree from nurseries in other Scottish Conservancies.

Chapter 19. Staff and Labour

(a) Staff

1. District Officers

From	To	Name
1932	1940	D. H. Bird
1940	1941	D. W. Harvey
1941	8.6.46	D. H. Bird
8.6.46	1948	T. H. Woolridge
1948	1950	H. A. Maxwell
1950	4.8.52	M. R. W. Williams
4.8.52		P. F. McIntyre

2. Foresters

From	To	Grade	Name
1932	1933	Foreman	J. Reid
1933	1937	II	T. Allan
1937	1938	II	J. M. Kennedy
1938	1947	II (Acting I from 20.1.40)	W. G. Milne
1947	1955	Head	S. H. A. Paterson
1955		Head	G. Gilbert

3. Present Staff

District Officer I	P. F. McIntyre
Head Forester	G. Gilbert
Forester	V. Masson

Present staffing is highly competent to handle the work, though the provision of a senior forester in the position of an assistant can be regarded as temporary only.

Durris is a training forest for industrial workers (see (b) below) and the post of assistant should be held by a probationer in the grade, for training under the tutelage of the Head Forester.

(b) Labour

The following tables show the present labour strength by age groups and grades:-

Age Group	Number Employed	%age of Total
Woman	1	4
Boys 16 yrs.	2	9
18 "	2	9
19 "	1	5
Men 20 - 30 yrs.	5	23
30 - 40 "	2	9
40 - 50 "	3	13
50 - 60 "	5	23
60 - 65 "	1	5
	22	100%

Grade	Number Employed	%age of Total
Gangers	2	9
Grade I	9	41
" II	2	9
" III	1	5
Trapper Grade II	2	9
Boys 16 yrs.	2	9
18 "	2	9
19 "	1	5
Clerkess	1	4
	22	100%

41% of workers are established.

Wastage is 19%.

Labour is of good average quality.

Chapter 19. Para. (b)

Recruitment of new workers is difficult. Although farming is the main occupation of the region, there are light engineering, building and contracting industries in the Banchory and Culter regions, and the local employment bureau rarely has suitable men on its hands. The Culter paper mills are major employers of local labour, and Aberdeen is near enough to attract country folk to better paid though less congenial urban work.

The forest is a training ground for personnel awaiting entry to forestry school. No training scheme operates, trainees taking their part in the regular work of the forest.

Gangers have been recruited from the squad and could be replaced by suitable material from the same source.

Piecework is used on draining and fencing.

Six workers occupy Department houses (See Chapter 20(a) below).

A Trojan Personnel Carrier transports up to fourteen men to their place of work.

Driving is assigned to a forest worker, who is given time for vehicle maintenance through the week. Staff use their own cars to supplement official transport as required, for which the agreed allowance is paid.

Working hours are:	Winter 40 hours Summer 44 hours
Starting times are:	Winter 7.45 a.m. Summer 7.30 a.m.

The main reporting point is Crathes Bridge, at which transport uplifts men at 7.25 a.m. in winter, 7.10 a.m. in summer, thus giving a standard 20 minutes running in the men's time to any part of the forest. The driver is paid overtime for this period. The same allowance at the end of the day is spent travelling in official time.

Other distant reporting points, which employees are expected to reach at starting time are:-

1. Hilton end of Road 44
2. Pitcowdens Cottage
3. Lochton Quarry, Blairydryne

Employees staying within reasonable distance of their place of work are expected to reach it at starting time, and to leave it at stopping time.

Chapter 20. Houses and Holding, Other Buildings and Special Installations

(a) Houses and Holdings

Housing for Head Forester, Assistant Forester and six forest workers is provided as follows:-

Kirkton of Durris	Head Forester
Wainsgate, Funach	Assistant Forester
Culpercie: 3 British Timber Houses	3 forest workers
Tilquhillie: 2 flats in old Schoolhouse	2 forest workers
Pitcowdens Cottage	1 trapper.

Chapter 20 Para. (a)

The four British Timber Houses are 14 years old, and have an expected total useful life of 25 years, i.e. until 1972.

This provision is just adequate.

There are no worker's holdings.

New houses are at present built by local contractor, the Aberdeen firm of Hall and Company being employed.

(b) Other Buildings

1. Kirkton

1 Forest office,
2 store sheds
1 garage
1 stone cottage - derelict

2. Culpercie

1 garage

3. Wainsgate

1 garage/store

(c) Special Installations

Petrol storage tank and pump at Kirkton of Durris.

Chapter 21. Research and Experiment

(a) Research Branch Work

Expt. No.	P. Yr.	Compt.	Wood	Species	Description
1	40	19, 21 b,d, a	Mulloch	E.L.	Provenance plots
2	35	68d	Pitcowdens	N.S.	Spacing plots
3	35	68d	"	S.S.	
4	43	95d	Clune	D.F.	High pruning
5/59 (GA)	35	67a 68a	Pitcowdens	N.S.	Manuring pole-stage crops

(b) Investigations by Local Staff

Expt. No.	P. Yr.	Compt.	Wood	Species	Description
-	33	70a	Monthammock	S.S.	Indicator Plot
	39	146d	Maryculter	J.L.	" "
60/12	43	94c	Clune	S.S.	Spontox application to S.S. in check in pure Calluna.

Chapter 22. Other Factors

Archaeological and historical objects of interest are listed below (See also Chapter 5(a)).

Chapter 22

Wood	Compt.	Feature
Mulloch	25	Stone Circle
Garrol	26	Stone Circle
Clune	93	Stone Circle
Cairnshee	14	Cairn of stones
Cairn-mon-Earn		Cairn of stones
Berry hill	114	Queen's Chair

Commemorative Planting:

Funach Wood, Compartment 33, sub-compartment c, was planted in 1937 with Norway spruce to commemorate the Coronation of His late Majesty King George VI.

Chapter 23. Working Plan Annual Report

(a) W.P. 20 to be prepared later.

Durris Forest - Working Plan - 1964

PART II

Chapter 24. Summary of Facts on which to base Proposals

(a) Forest Conditions and Potential

The early estate planting was on the lower valley slopes carrying a deep soil, and these areas are growing their third crop in a little over a century. Forest soils are now well-developed on these sites, and although fungal disease, notably Fomes annosus, is well-established, good quality crops should be grown on short rotation. In the case of the previous crops mentioned this has been of the order of 50/60 years.

The more highly productive sites occupying approximately 2000 acres are expected to support Quality Class III crops of the following species:-

Douglas fir
Sitka spruce
Norway spruce
Japanese larch
Scots pine

Higher moorland areas were planted late in the last century, and the single crop that preceded the present plantations has done less to modify the leached soils. Many of the areas now being planted have never carried tree crops in historical times.

These less attractive sites occupying approximately 4000 acres are reflected in the following table showing a lower anticipated production:-

Species	Quality Class
Douglas fir	V
Sitka spruce	IV
Norway spruce	IV
Japanese larch	V
Scots pine	IV
Pinus contorta	III (for S.P.)

(b) Existing Crops, Volumes and Increment

Classification	Area (acres)	P. Year Groups					
		P.61	P.51-60	P.41-50	P.31-40	P.21-30	Older
High Forest							
Conifers	4589	253	1248	1770	1146	172	-
Hardwoods	46	2	12	18	7	-	7
Total	4635	255	1260	1788	1153	172	7
Plantable Reserve	1394						
Other	616						

Species	Area (acres)	Average Q.C.	Measurable Volume (000 h.ft.)	C.A.I. (000 h.ft.)	Remarks	
					Classification of Volume	
					B.H.Q.G.	% of Volume
S.P.	585	III	172	15	2° - 6"	82%
P.C.	168	N.C.	-	-		
E.L.	132	IV	35	4		
J.L./H.L.	603	IV	288	29		
D.F.	222	V	15	2		
N.S.	598	III	173	19		
S.S.	1028	IV	301	40		
S.S./S.P.	552	N.C.)				
S.S./P.C.	251	N.C.)	8	1	6¼"- 9"	18%
S.P./E.L.	318	N.C.)				
Other Conifers	132	N.C.)			9¼" & above	-
Hardwoods	46	N.C.				
	4635		992	110		

(c) Choice of Species and Techniques

Reference was made in Chapter 10 to the favourable growth of Sitka spruce plantations put down by the early foresters on Durris Estate, but in those days planting of the species was confined to deep fertile peats and loams. The reputation enjoyed by this species accounts for its wide and continuing use in past and present Forestry Commission management. It occupies roughly one third of the total area planted to date. Early spruce planting was on mound laid out at the formation of the drainage pattern over wet grassy areas, or notched in on drier Calluna grass, where a line mixture with Scots pine was introduced in the late '40s. Enthusiasm for Sitka spruce has resulted in it being used to excess on hard Calluna ridges where it is making limited progress.

Current practice with Sitka spruce, as with other species, is to plant on plough with Pinus contorta where calluna vegetation predominates. Poor heathland soils lead one to choose the plough ridge as the planting position in virtually all current planting.

Scots pine, second to Sitka spruce in area planted, occupies much of the hardest ground with shallow soils. Notched in to Calluna in the early years, its progress can not be considered satisfactory. The more westerly parts sheltered from the east are more suitable, but the most recently acquired land, amounting to about 1900 acres, is particularly unsuitable because of exposure to the east, and the species is consequently little used in current planting. On hard and shallow soils, current practice is to use Pinus contorta of a suitable (coastal) provenance.

Japanese larch has been used quite extensively on heathland areas, with variable success, but on the whole the better sites were chosen for notch or plough planting, and it has been a useful soil improver and pioneer species.

Douglas fir, a high volume producer in the early estate plantings, has been used to a minor degree on carefully chosen sites with deep well-drained soils. Here it progresses well, though the strains used have more often than not been of rough-branched type with a marked departure of stem from the vertical. Opportunities for its use today are confined to underplanting and replanting in the more sheltered early plantings.

(d) The reserve of Plantable Land is 1394 acres with a further 100 acres on Drum Estate under negotiation. This willbe exhausted by 1966. There is no immediate prospect of a large-scale increase in available land.

(e) Produce and Markets

Pitwood and boxwood form the bulk of the produce, which has found a steady

sale to Aberdeen industry and the Scottish coalfields.

The policy is to sell timber standing. Trials elsewhere in the Conservancy have shown that this method produces the best stumpage value.

The possibility of selling, felled at stump, or at roadside is not precluded, should it be necessary to give work to men who would otherwise be redundant.

It is, however, anticipated that retirement and normal wastage will make this unnecessary.

(f) Staff and Employment

Average number employed is 22, of which one quarter is over 50 years old, and one quarter below 20. This is expected to fall to about 14 after planting is completed.

(g) Any other Factors of Importance in deciding Future Action

All woods in, or approaching the thinning stage have been supplied with roads. The road layout, which has been planned during the last 5 years gives a total of 66 miles (including access roads). This works out at approximately 7.1 miles per square mile.

The layout provides for a maximum drag of approximately 220-230 yards.

Road making plans are in force to build road formation at least 2 years before an area is ready for thinning. When the W.P. survey was carried out, the forest was re-compartmented, using roads or roadlines as compartment boundaries wherever possible.

Chapter 24 approved
A Humphrey Penn
18th December, 1964.

Chapter 25(a). Objects of Management

Based on Part I, and particularly on Part II Chapter 24, the following considerations affect management.

1. The area involved - 6,623 acres of which 4,635 acres are planted as at 30.9.61 is substantial enough for individual management. Durris is considered to be an adequate charge for an efficient forester and to produce sufficient volume annually to give satisfactory marketing prices.

2. Though there are large areas of moorland to the south of the forest, these are largely given over to sport and further sizeable additions to the area are unlikely.

3. Up to F.Y. 61, there was no difficulty in selling thinnings standing. The prices obtained were higher than the average for the Conservancy. The timber went mainly to mining timber markets with a smaller proportion to boxmaking mills in Aberdeen.

N.B. (Due to the high proportion of small first thinnings in the most recent sale, it did not attract an offer and was subsequently sold by negotiation at 9½d per h.ft. O.B., a poor price for the locality. It is anticipated that, when the volume of spruce suitable for boxmaking and bigger saw timber increases, the proximity of the forest to Aberdeen and Banchory will ensure a ready sale at good prices).

4. About 16% of the total planted area is in the production stage, but this proportion will increase rapidly over the next decade.

5. The main species in the present crop is spruce - S.S. 31% and N.S. 14%. Except for sites sheltered from the east, S.P. (28%) is not considered a suitable species for the locality. Much of this 28% is growing in mixture with S.S. and will disappear from the crop at an early stage. J.L. (14%) has grown well, but is considered a pioneer species and existing stands will be treated for underplanting, with D.F. and N.S. mainly.

The principal species of the forest will be S.S., N.S., P.C. and D.F. S.S. has been used on a wide variety of sites, from deep moist peaty sites to dry moorland sites. Current planting of the species on the latter is in mixture with a coastal variety of P.C. The mixture ranges from one containing only a few hundreds of S.S. per acre to the traditional 50/50 mixture, according to the degree of moistness.

P.C. (coastal) will be used also as a pure crop on hard dry sites yet to be planted, for the replanting in the future of similar sites, where S.P. was used in the past, and for the rehabilitation of certain areas of S.S. which were planted without ploughing on dry calluna sites.

Some of the P.C./S.S. mixtures, having a small proportion of S.S., which have been planted recently and which are to be planted during F.Y's. 62/66 will probably turn out to be virtually pure P.C. crops. It is, however, thought worth while to use some S.S. in mixture even though they only reach box wood size.

The locality is marginal for S.S. from the rainfall point of view and the potentialities and silviculture of the species in these conditions is largely unknown, as is the productivity beyond a fairly early age. Its susceptibility to wind throw, to root-rot and to defoliation and loss of growth following sudden exposure are apparent.

The species is a very valuable one and cannot easily be replaced on Durris. It is likely therefore to be the main productive species of the forest.

6. N.S. has been grown on sites suitable for the species and the management of stands of this species do not present serious silvicultural problems, except for the study of thinning and drainage techniques aimed at increasing stability. Fomes annosus is likely to cause some loss of income, but protective measures are in force.

7. D.F. represents only a small proportion of the present crop, but it will be used freely in the future for the underplanting of J.L. and E.L. stands. The best methods of introducing this undercrop will have to be studied and trials of different methods of doing it will have to be carried out.

8. The dominant problem of management in the years immediately ahead will be the development of suitable techniques and silviculture for S.S. which, growing on a site far from ideal is nevertheless the main productive species, and, as far as can be seen is likely to remain so. Experience only will show how long this species is likely to continue to produce an economic increment. As the rootable depth is generally very restricted and as rainfall is inadequate, a fall off in the increment and a tendency for more wind throw to occur may be widespread around 40 years of age. A type of thinning which will get the main crop trees to millable size in that time and at the same time increase the stability is virtually the only silvicultural technique available, apart from efficient drainage of deep peats and flushes.

9. The long term aim will be to create and maintain a healthy and stable high forest based on Sitka spruce and Norway spruce as the main productive species, with Pinus contorta and Douglas fir as important secondary species. The conditions of the site permit little choice and dictate that the species mentioned above are those most likely to show the highest profit. It is not considered necessary or indeed useful to support these conclusions by profitability assessments.

At this stage it is considered that firm prescriptions aimed at achieving sustained yield by some finite date are inappropriate. It is expected that when the plan is due for revision, some of the earlier plantings will be approaching the final age and size.

Chapter 25 (b)

General objects of management

1. Within the limits set by other policy objectives, to manage the Working Plan area for the production of timber as a commercial enterprise and to earn the highest possible net discounted revenue (calculated with an interest rate of 3½%).

2. To expand the area of productive forest but to avoid investments in unprofitable plantations except where it is necessary to provide other benefits such as the provision of employment, protection and amenity.

3. To achieve and maintain a minimum permanent skilled labour force, not necessarily paid by the Forestry Commission, to meet the requirements of the Working Plan, bearing in mind the Forestry Commission's policy of maintaining a healthy home timber trade.

4. To pay regard to amenity, recreation, sporting, scientific interest and the protective role of the forest and to maintain or improve the fertility of the soil.

5. To be a good landlord and neighbour.

Local objects of management

1. As a long term aim, to create and maintain a healthy and stable sustained yield high forest, based on Sitka spruce and Norway spruce as the main productive species, with Pinus contorta and Douglas fir as important secondary species.

2. To give special and urgent attention to measures designed to promote crop stability, including appropriate thinning techniques, the efficient drainage and speedy replanting of blown areas.

3. To replace or enrich unsatisfactory stands, mainly of S.P., E.L. and J.L. by heavy thinning and group felling, and underplanting with D.F., N.S., some silver fir and small quantities of suitable hardwoods, where conditions permit this.

4. To produce timber of sawmilling size and quality. The fixing of a firm rotation size or age will best be left open until the present plan is due for revision.

5. To encourage the establishment of a permanent timber working industry and community in the district and to provide the nearby box mills in Aberdeen with logs of a quality comparable to imported logs.

6. To achieve some diversification of species and to lay out the forest so that the amenity of this attractive and popular part of Deeside is enhanced.

Chapter 26 approved
[illegible]
18th December, 1964.

Chapter 26

Summary of Prescriptions for Achieving the Objects of Management

(a) Amenity

The forest is situated in a most pleasant part of Lower Deeside. Our planting has done much to improve the look of the countryside. Long straight compartment boundary rides are less obvious at Durris than at some other forests, as are narrow larch fire protection belts. Most of the compartment boundaries in recently planted areas are contour roads, and where a purely administrative compartment boundary ride is left, it will be narrow, so that it will be invisible in the canopy when the pole stage is reached. J.L. and H.L. fire belts will be

made as irregular in shape as possible.

Suitable hardwood species will be planted in random fashion on roadsides and where they occur at present, they will be preserved, irrespective of timber value, at the expense of a few conifers.

Natural birch will never be cleared. The silvicultural and amenity value will be preserved by thinning for underplanting and by partial felling for group planting. On roadsides, pure birch groups will be retained.

Except in times of high fire danger, the public will not be discouraged from using forest roads for walks. The pleasure of this recreation will be much enhanced by the exclusion of motor cars.

(b) Organisation

The forest will be under the control of one Forester assisted by an under forester or assistant forester. It will consist of one working circle during the period of the plan. Apart from the clearing of a few small partially blown areas, there will be no clear felling during the period of the plan. Wind damage will certainly lead to the clearing of small patches from time to time. It is unnecessary at this time to consider felling series.

For thinning, drain maintenance, road maintenance and brashing, the forest is divided into three working blocks, which are approximately equal in area and productivity capacity. These will be revised when it becomes necessary to increase the interval between thinnings.

(c) Planting Rate

As at 30.9.61, 1,394 acres remain to be planted (see W.P.11). Planting proposals are as follows:-

P.62	312
P.63	300
P.64	300
P.65	300
P.66	182
	1,394

Plant requirement forecasts for this planting, normal and beating up, and for the underplanting of larch stands have been made. Sowing and lining out to meet these requirements are being carried out in Conservancy Nurseries.

The forecast requirements are in the following proportions:-

F.Y.	P.C. (c) %	H.L. and J.L. %	N.S. %	S.S. %	D.F. %	Other incl. Hardwoods %
62	29	4	2	60	-	5
63	33	7	-	59	-	1
64	46	3	3	42	4	2
65	46	10	2	37	4	1
66	69	2	2	20	4	3

(d) Silvicultural Operations

The main silvicultural considerations during the period of the plan are the

continuance of a thinning technique designed to promote stability; to get the main crop trees to millable size before wind damage becomes too great a hazard; the maintenance and improvement of the drainage system in spruce stands; the improvement of poor pine and larch stands by enrichment.

Stability

Past experience in north east Scotland, suggests that wind will dictate to some extent how our woods will be managed. We may expect damage from wind on an increasing scale as more of our plantations reach the vulnerable height of 40 feet and upwards. It is impossible to avoid this, but measures are being taken to mitigate this loss.

These are as follows, but they will be modified as necessary in the light of experience:-

Special Thinning Techniques

First thinnings will be carried out in spruce stands about three years earlier than has been the practice heretofore i.e. at a top height of 24 feet to 27 feet. The aim will be to maintain a natural canopy structure by removing as many wolf trees as possible for the benefit of well formed dominants, at a stage when crops are not prone to wind damage; and by leaving, where they have a chance to develop, all small trees, thus forming some sort of under storey; by accepting in the crop a proportion of otherwise undesirable big rough trees for the sake of stability. From the start of thinning, vigorous dominants of good form will be persistently favoured to promote deep crowns, strong rooting and heavy increment.

Treatment of Forest Margins

Most of our damage from wind has started from exposed margins. All young woods will be treated at an early date to produce on their margins 2 rows of trees with big crowns and big root systems. In existing woods every second tree will be removed in the outer two rows. As this must be done before these trees have a timber value, all young stands will be treated as soon aspossible. In future plantings, the outer two or three lines will be planted at double spacing. Where ploughing is done the margins will be completely ploughed to a width of about 20 feet.

Felling and Clearing

Where wind damage occurs blown holes of ¼ acre or more will be cleared and planted as soon as possible. This will give an opportunity to diversify species and size. While the main species will be Sitka spruce, other species, including the more windfirm hardwoods will be used freely.

Drainage

Particular attention willbe given to drain clearing. It will be done by blocks every three years. Deep "cut off" drains will be made in blown areas before replanting is done or immediately thereafter. This can only be done economically by machine. Trials have been made with a hired digger at other forests and drains 2 feet in depth can be made among stumps for about 25/- per chain. There is a need for a Conservancy digger mounted on a tracked vehicle for this work in standing woods and in areas being planted.

Planting

The land remaining to be planted is mainly dry heathland interspersed with basins of deep peat. Dry areas will be tine ploughed and peaty areas Cuthbertson ploughed. As the land is of low fertility, planting on the tined areas will be through the slice rather than in the tined furrow. It is considered that this will give a better root formation and lead to greater stability.

Treatment of Inferior Crops

Unsatisfactory stands of Scots pine, European Larch and Japanese Larch will be underplanted following partial felling or group felling as soon as they are sufficiently developed for this to be done. Species to be used for planting in these circumstances will be Douglas fir, Sitka spruce and Norway spruce but minor amounts of hardwoods may be introduced for soil improvement, and of Silver firs (especially A. grandis) to provide evidence of its suitability for use on a wider scale in future as an alternative to spruces and pines.

(e) Regulation of Yield

For the next ten years, it is not proposed to carry out late or early fellings with a view to improving the size class structure. On the other hand it is quite certain that substantial gaps, of unknown size and location will be created by windblow. These will be dealt with as they occur.

Apart from the clearing of blown areas and the heavy thinning of Japanese larch and Hybrid larch for underplanting, the production from the forest will be from normal silvicultural thinnings.

The forest is divided into three working blocks of reasonably equal productive capacity. Thinning will be confined to one block in each year so that the faster growing crops (mainly Sitka Spruce) will be thinned on a 3 year cycle and the slower growers on a 6 year cycle. It is intended that the interval between thinnings will be extended as soon as this can safely be done, bearing in mind the danger of wind damage but also the greater economy of longer intervals.

The C.A.I. shown in W.P.4 is 110 m. H.ft. This was obtained from yield tables, for areas having a measurable volume in F.Y. 61. The presence of many scattered groups of Sitka spruce emerging from check over a wide area, which could not be given a volume at the time, suggest that the C.A.I. is underestimated. A detailed check of all areas in, or approaching, the thinning stage has given thinning yield forecasts as follows:-

F.Y.	Acres	Total Volume of Thinnings	Thinning Volume per acre
61	137	27,000	200
62	320	53,500	170
63	304	80,500	265
64	204	58,000	260
65	535	199,000	372
66	429	172,000	385

Thinning volumes per acre are low, but there are in the thinning stage many thinly stocked stands of Scots pine and European larch, and present thinning areas of Sitka spruce frequently occur as patches emerge from check.

(f) Roads

Short term and long term roadmaking plans have been prepared for the making of 28.1 miles. These are:-

Short Term

F.Y.	63	64	65	66	67
Miles	0.9	-	3.5	-	3.7

Long Term

F.Y.	68/77	78/87
Miles	11	9

These will be kept under constant review in the normal course of forecasting for five years ahead.

(g) Marketing

The policy will be to sell all timber standing. The forest is not within the area of supply to the proposed pulp mill at Fort William and with a contracting demand for pitwood it may be difficult to dispose of small sized thinnings in the years immediately ahead. On the other hand box wood logs should find a ready market in Aberdeen and if a pulp or chipboard mill should be established in Aberdeen or further south on the east coast of Scotland, Durris will be in a good position.to supply it.

It is proposed in F.Y. 63 to negotiate a sale to Messrs. Timbuyers, who bought the F.Y. 62 sale. This firm have shipped pulpwood to Norway and may do so again from Aberdeen, in which case Durris would be a very convenient source of supply.

(h) Protection

1. Fire

The forest consists of many blocks of woodland surrounded by arable farms, and fire risk is not above normal.

No extraordinary measures are necessary. The provisions of the Standing Fire Plan will be strictly observed.

2. Vermin

Rabbits and hares are numerous in this predominantly agricultural country. There is an active Rabbit Extermination scheme in the area and this helps to keep down numbers on surrounding agricultural ground. Nevertheless it is necessary for us to employ two full time trappers to control rabbits, hares and roe deer.

Roe deer though numerous in the district have been adequately controlled as is shown by the success of recent underplanting and the replanting of scattered windblow. One of the trappers has recently attended a course on roe deer control. A study of the population and habits of roe is being carried out in the forest and high seats are being erected.

3. Insects

Apart from Neomyzaphis which has caused defoliation in some years, there are no special problems.

4. Fungi

Fomes is present on all old woodland sites. Creosoting of stumps has been carried out by merchants' contractors since 1957 and will be continued.

(i) Staff and Labour

During the period of the plan, the existing staff of one Head Forester and one Under Forester or Assistant Forester will be adequate. There are two experienced gangers.

The present squad of 22 is adequate. With standing sales and no planting programme beyond F.Y. 66, labour requirements will fall to about 12/14 men towards the end of the period of the plan.

Retirals and normal wastage will obviate the necessity of paying off any men.

Chapter 26 (contd.)

(j) Housing

The present housing is adequate for our needs.

(k) Miscellaneous

The problem of maintaining health and stability in Sitka spruce crops in this area of low rainfall is one which requires study by the Research Branch.

Chapter 26 approved

H Humphreys Davies

18th December, 1964.

Durris Forest Working Plan

PART III

Chapter 27. Estate Management

(a) Plantation Fences

Rabbit proof fences will be dismantled progressively from around woods, as their age and deteriorating condition makes them no longer economic to maintain.

Neighbouring farmers have been accustomed to rely on our rabbit fences to withstand their stock, and this has shortened the life of our fences. The neighbouring estates will be called upon to share the cost of erecting and maintaining stock fences wherever the need becomes apparent. The present arrangement with Dunecht Estate is that:-

(i) the estate provides the posts

(ii) Forestry Commission provides the wire

(iii) the tenant spreads the material and erects the fence.

This appears the most economic way progressively to solve an awkward liability, and it should be pursued.

(b) Reservations

The reservations listed at Part I Chapter 4 paragraph 2 (i to iv) will be observed.

Reservation (iv) relating to North of Scotland Hydro-Electric Board access to Cairn-mon-Earn has been extinguished by the construction of a motor road to the Cairn. Foot access by way of the path through the corridor is still granted in favour of North of Scotland Hydro-Electric Board.

(c) Servitude rights listed at Chapter 4 paragraph (d) 3 will be observed.

(d) Rights of way over the routes listed in Chapter 4 paragraph (d) 4 will be preserved.

(e) Sporting Interests

The interests of the sporting tenants, listed at Chapter 4 paragraph (d) 5 will be borne in mind.

Chapter 28. Amenity

(a) Policy

Exercise by the public on foot or on horseback is encouraged, though restricted access may be necessary in time of fire danger. Horse riding has caused damage to new road surfaces. This will be controlled where necessary and payment for use exacted from Riding Schools.

The use of forest roads by motorists is increasing. The policy is to prohibit the entry of cars on pleasure bent. If necessary this will be done by locking gates at main access points.

Chapter 28. contd.

(b) Measures to be Adopted

1. Underplanting

Species used in larch underplanting will have regard for amenity.

2. Roadsides

Views from public and forest roads will be preserved, and where possible roadside beauty will be enhanced by the use of hardwood groups, including flowering species where practicable.

Chapter 29. Organisation

(a) Administrative Subdivisions

1. District - Deeside and Upper Strathdon
2. Forest - Durris
3. Sections } - None
4. Beats }
5. Working Blocks - Three, as listed at Chapter 7 (b) 5.
6. Compartments are conventionally arranged with an average acreage of around 30. They are based on road lines with inter-connecting extraction lanes.

(b) Management Subdivisions

1. Working Circles }
2. Felling Series } None proposed
3. Cutting Sections }
4. Sub-compartments are designed on the lines indicated at Chapter 7 paragraph (c) 4 (i)-(iv).

Chapter 30. Planting Rate and Resumption of Land

(a) Planting

From 30th September 1961 planting has been at the following rate:-

Forest Year	Acres Planted
62	312
63	314
64	366
65	359

For F.Y. 66 the programme is 140 acres. This exhausts available land reserves.

Chapter 30. contd.

(b) Resumption

Nil.

Chapter 31. Silvicultural Systems

(a) General

It seems likely that the method of crop renewal in the immediate future may be influenced, if not indeed determined, by windblow. These will be immediately replanted.

Stable areas not affected by natural destruction will be replaced by localised felling coupes on reaching optimum exploitable size. (See (c) below).

Japanese Larch areas scheduled for replacement by more profitable shade-bearing species will be reduced gradually following underplanting.

(b) Thinning

Crown thinning, on a three year multiple cycle, will be practised. It is recognised that when crop trees are freed from competition to their final spacing, a period of low thinning may precede their removal at maturity. A basic feature will be the early identification of elite trees chosen for their vigour and good form.

(c) Felling

As stated above, the wind is already dictating the shape and size of felling coupes on unstable sites. Where we retain control, topography will determine the extent of clear felling. A coupe, or successive coupes will, for example, embrace one face of uniform exposure, or a peat hollow exhibiting singular features of instability.

Rotations will be guided by the range displayed in the appropriate yield classes of Management Tables. It will, however, be the general aim throughout the life of a plantation to produce a final crop of trees of the exploitable sawmill size currently in demand; and this in as short a rotation as possible.

See Appendix I for felling proposals in windblown and unsatisfactory stands.

Chapter 32. Crop Establishment

(a) Choice of Species

With the last planting year (P.66) now in sight this is significant only as it relates to the replanting of clear felled or windblown areas, and to the replacement of larch stands.

In the first case the opportunity will be used to introduce a wider variety of species where the site permits. Windblown areas are likely to be moist peat sites, and seem destined to be perpetuated under spruce.

Larch underplanting will use Douglas Fir or Abies species where these are suitable. It is hoped that a suitable strain of European Silver Fir (Abies alba) may be available.

Chapter 32. contd.

(b) Preparation of Ground

Windblown areas will require lop and top disposal before draining. Cut-off drains around the head of wet sites will be made as soon as possible after windblow as an essential measure towards stabilising edges and as a necessary preliminary to replanting. Mechanical drainers will be used where possible.

(c) Planting Methods

Mound planting will be standard on wet sites.

Notch planting will be normal on woodland sites where ploughing is impossible.

Notch planting will be used for underplanting. No plants will be put beneath the crowns of overstorey trees.

(d) Weeding
(e) Beating-Up
} will be carried out as deemed necessary.

Chapter 33. Crop Maintenance

(a) Fencing

Rabbit fences will be maintained until plantations reach thinning. With the damage and necessary dismantling this causes fences will then be progressively abandoned.

Farm neighbours have over the years ceased to maintain march dykes and stock fences, relying on our internal fences to withstand their beasts. This custom is being resisted, and agreement has been reached with marching estates to share the cost of reinstating the worst sections of stock fence. This work will be continued and extended.

(b) Cleaning

The removal of competing tree species will be done as far as possible whilst weeding is still in progress. Hardwood species, either singly or in groups, that have competed so strongly as to establish themselves in the crop, or which are occupying areas to the exclusion of the planted species, will be preserved for their soil improvement and amenity value.

(c) Draining

The block system on a three year cycle will be maintained. This will follow the thinning block, and will pay particular attention to the less stable spruce sites.

Windblown areas will receive special treatment. Surface water will be led off by cut-off drains around their margins.

(d) Racking

This is incorporated in the current system of brashing (quod vide).

(e) Brashing

This is confined to spruce crops. The current instructions regarding line brashing will continue. In the case of Sitka Spruce this comprises the removal of adjacent branches of trees along a line or alley running in the expected

direction of the extraction of thinnings. This will normally be at or near a right angle to the nearest extraction route. Between each alley so formed two lines of trees will be left quite unbrashed. Superimposed upon this, and carried out immediately after it, will be the selection of the best crop trees at 7-10 yards spacing, both in and between the alleys. These will be pruned (quod vide) to 10 feet.

In the case of Norway Spruce the density of line brashing may be half that for Sitka spruce.

This work will normally be done a year before marking for thinning.

(f) Pruning

Proposals for spruce crops are detailed under (e) Brashing above.

Scots Pine crops will be pruned before marking for first thinning, when the average diameter breast height of the selected crop trees (around 200 in number per acre) does not exceed 4". All branches will be removed initially to 10 feet above the ground. Up to 150 trees per acre will subsequently receive further pruning to 20 feet.

(g) Other Operations

Nil.

Chapter 34. Crop Improvement

(a) Enrichment

None is envisaged.

(b) Rehabilitation

Where Birch clumps or groups are to be preserved along with group planting of conifer crops the Birch will be improved by thinning to the straightest stems with crowns of best form.

(c) Other Methods

The progress of checked spruce areas in heather will be watched. If judged economical growth will be assisted by the application of a suitable herbicide to the heather.

Chapter 35. Regulation of the Yield

(a) Measures to Improve Age or Size-class Structure

No measures to achieve a graded age structure are proposed in the first decade. The replanting of windblown areas will tend towards a more irregular canopy.

(b) Thinning

Heavy group cutting in poor pine stands, and thinning larch for underplanting, will contribute an outturn higher than normal for these areas. Such treatment will be spread evenly throughout a period.

Other production will be from normal silvicultural thinnings, regulated by blocks of comparable yield.

(c) Felling

See Appendix for the limited fellings planned. Management Table recommendations will aid decisions as to final crop removal in the case of those stands enduring to rotation age.

(d) Volume Out-turn from Thinning and Felling

See forms W.P.17, W.P. 18 and W.P.21.

(e) Growing Stock

An estimate based on form W.P.4 at 30th September 1961, but using revised C.A.I. estimates at 24th June 1963 is:-

F.Y.	Acres thinning and having increment	Total Growing Stock (000s H.ft.)	Average volume/acre (H.ft.)
65	1282	1732	1351
70	1628	1982	1217
75	1974	2257	1144
80	2451	2612	1065
85	2792	3052	1093

The increment figures include all increment, that is, no proportionate reduction has been made for the volume that will in fact have been removed in thinnings.

Chapter 36. Roads and Access

(a) New Forest Roads

The complete road plan reveals that the 6142 acres of plantation created and proposed will require 5322 chains of forest roads, including accesses. This is equivalent to 6.9 miles of road per square mile of forest.

Calculations of road density by alignment chart, ref. P.W.P.T.I. No. 20 follow :-

1. Evaluation of m:

Construction cost of roads	=	£2000 per mile
Interest at 3½%	=	£70
Annual maintenance cost	=	20
Total annual road charge	=	£90 per mile

2. h = 1½d per h.ft. per 100 yards.

3. Evaluation of v:

(i) Proportion of species planted to 30th September 1961:-

Species	Acres	%	Average Yield Class
Lodgepole Pine Scots Pine	1472	32	80
Japanese Larch Hybrid Larch	603	13	80
European Larch	132	3	60
Douglas Fir	222	5	120
Sitka Spruce	1430	31	180
Norway Spruce	598	13	120
Other Conifers	132	3	120
Hardwoods	46	-	-
	4635	100	

(ii) Summary of Yield Classes:-

Yield Class	%	Weighted Yield Class
60	3	1.8
80	45	36.0
120	21	25.2
180	31	55.8
	100	118.8

Average Yield Class = 119, say 120

$\therefore$ v = 120

4. k = 0.4

5. Summary of Factors for alignment chart:-

Factor m = £90
h = 1½d
v = 120
k = 0.4

From alignment chart:

Optimum road density = 6.0 miles per square mile of forest.

Normal timber extraction traffic is catered for by a road system built to the following specification:-

(i) Normal maximum gradient 1/10.

(ii) Minimum radius of curvature 23 feet on centre line.

Chapter 36. (a) contd.

(iii) Width of formation 15 feet.

(iv) Width of metalling 9-11 feet.

(v) Culverts averaging 15 per mile; minimum diameter 12 inches.

Road mileages required are:

	F.Y. 65	F.Y. 66	F.Y. 67	F.Y. 68	F.Y. 69	F.Y. 70-74	F.Y. 75-79
Miles	4.8	3.3	-	-	3.1	3.3	3.3

(b) Existing Forest Roads

Maintenance by powered grader and roller will follow the thinning blocks.

Hand maintenance of drains and culverts will be applied in due season wherever it is needed.

(c) Access

Road No. 045 - Baads Wood, length 50 chains, will require major reconstruction in period F.Y. 70-74.

(d) Public Roads and Bridges are all adequate.

Chapter 37. Powered Vehicles and Machines

It is anticipated that the following vehicles will be needed:

(i) 12 cwt. van for Forester
(ii) Personnel carrier

Car allowance will be paid to individual workers who get themselves to outlying places for occasional tasks. The policy of paying car allowance to one trapper engaged on outlying blocks has been suspended meantime in favour of sharing a trapper with Blackhall, and supplying a Departmental van. Should this scheme continue satisfactorily this further 5 cwt. official vehicle will be required jointly by the two forests.

Chapter 38. Marketing and Exploitation

(a) Marketing

The Conservancy policy of selling timber standing will continue at this forest. This does not preclude the possibility of some timber being worked Departmentally in order to keep staff employed after the exhaustion of the last land reserves in F.Y. 66. Such working would probably be linked with a sale at stump or at roadside.

The main production will be of round pitwood, with a steadily increasing proportion of sawn mining timber and boxwood.

Markets for the smaller class of material are uncertain with the contraction of the mining industry. The demands of Scottish Pulp are expected to help. Norwegian pulp has been produced from Durris thinnings, and there may be room to

expand this outlet.

Sawn timber finds a steady boxwood market in Aberdeen, though no great expansion is likely so long as the industry is content to supply purely local demand.

(b) Exploitation

1. Standing Sales

The three-block structure of the forest, geared to multiples of three-year thinning cycles, will be continued. All areas within the current block will be inspected at the time of marking.

Measurement will be by tariff.

Supervision will be the responsibility of the Head Forester.

Protective stump treatment against Fomes annosus and peeling against Myelophilus and Ips species in pines and larches will be standard practice.

Extraction and conversion methods will be left to the judgement of buyers so long as these conform to good practice and have no harmful effects upon standing crops or extraction routes.

Time Limits

Adequate time will be given in contracts for the completion of operations. There will be a stringent observance of expiry dates, which will not be extended without good cause.

2. Commission Working

This will not normally be undertaken, but when it is appropriate piecework rates will be negotiated. Where desirable extraction and despatch may be done by contractor.

Chapter 39. Protection

(a) Animals

1. Roe Deer

A roe deer control scheme is in being, incorporating the use of high seats. Deer will be killed from these only by the use of .222 rifle.

2. Brown Hares
3. Rabbits

will be pursued and eradicated from plantations and surrounds wherever they appear, in close co-operation with the local Rabbit Clearance Society.

(b) Birds

1. Capercaillsie
2. Blackgame

will be reduced in areas where their depradations are evident.

(c) Insects

1. Myelophilus species will be controlled at the right season by peeling. This applies to other of the Hylesininae, such as Ips cembrae, should they be found in the forest.

Chapter 39. (c) contd.

2. Hylobius species will be controlled on recently felled sites by dipping with Didimac all stock used in replanting.

(d) Fungi

Fomes annosus will be controlled by stump treatment with creosote, sodium nitrite or such other preparation as may be developed.

(e) Climate
(f) Trespass
} No specific precautions necessary.

(g) Fire

Precautions prescribed in current plans.

Chapter 40. Nurseries

None.

Chapter 41. Staff and Labour

(a) Staff

The forest will be run by one Head Forester or senior forester, with one Assistant Forester, who will be a probationer.

(b) Labour

The squad is expected to fall from 22 to 12-14 over the period of the plan. The run-down will be gradual after the exhaustion of planting reserves after F.Y. 66. The reduction will be achieved by normal attrition, avoiding discharge.

Chapter 42. Houses and Holdings, Other Buildings and Special Installations

(a) Houses and Holdings

1. (i) Head Forester's house at Kirkton of Durris will be maintained there.

(ii) Assistant Forester's house at Wainsgate, Funach Wood, is a B.T.H. This is due for demolition in 1972, when another site will be selected for a replacement.

2. There are three B.T.H.s at Culpercy, also due for demolition in 1972. The local housing authority will be asked to provide dwellings for such occupants as the forest may still require.

Two flats in the Tilquhillie Schoolhouse can not be considered ideal accommodation for workers. Their economic life is not immediately limited, and they will continue tenanted so long as suitable workers are willing to occupy them.

Pitcowdens Cottage is let to the resident timber merchant for sub-lease to a cutter. This arrangement will continue so long as it proves satisfactory.

Chapter 42. contd.

(b) Other Buildings

The existing buildings are:-

1. At Kirkton:

(i) Forest Office

(ii) Two store sheds

(iii) One wet weather work shed

(iv) One toilet

(v) One garage

These are adequate and will be maintained.

2. At Culpercy:

One garage for personnel carrier. This will be maintained there so long as the vehicle is required to be housed there.

3. At Wainsgate:

One garage/store. This will be maintained there until this house site is abandoned.

(c) Special Installations

The petrol storage tank and pump at Kirkton will be maintained there so long as the present holding of transport justifies it.

Chapter 43. Other Prescriptions

Indicator Sub-compartments will continue to be measured periodically. These are at:-

P. Year	Compartment	Wood	Species
33	70a	Monthammock	Sitka Spruce
39	146d	Maryculter	Japanese Larch

APPENDIX I

Estimated Production from understocked and unsatisfactory stands.

Year to Clear	Wood	P. Year	Species	Acres	Volume (000s H.ft.)	Remarks
66	Mulloch	40	Scots Pine	2	1	Clear fell
66	Sunnyside	25	Japanese Larch	2	6	" "
67	Kinclune	02	Scots Pine	3	7	" "
67	Brachmont	42	Scots Pine	16	15	Group fell
67	"	25	Scots Pine/ Norway Spruce	3	5	Clear fell
69	Cairnshee	25	Scots Pine	48	42	Group fell
70	Newmillhill	11	Scots Pine	3	5	Clear fell
74	Pitcowdens (Strathie)	25	Scots Pine/ European Larch	6	10	Group fell
80	Craiglug	42	Scots Pine	6	8	Clear fell
80	Curracksteane	40	Scots Pine	7	9	" "
				96	108	

DURRIS FOREST
WORKING PLAN MAP 1964
DURRIS FOREST
MIDMAR FOREST
ABERDEEN
Echt
Garlogie
Countesswells Forest
Peterculter
Culter
Cove Bay
Drumoak
Banchory
Maryculter
Banchory-Ternan
Kincardine O'Neil
Crathes
Kaimhill
Torphins
Lumsden
Strathdon
Cairn Gorm
Ben Avon
Ben Macdui
Cairngorm
Braeriach
Cairn Toul
Sgor an Lochan Uaine
Carn a' Mhaim
Creag Meagaidh
Ben Nevis
Aviemore
Kingussie
Newtonmore
Grantown-on-Spey
Nairn
Inverness
Cromarty
Dingwall
Tarbert
Stornoway
Lochgilphead
Oban
Fort William
Kyle of Lochalsh
Ullapool
Lochinver
Tobermory
Mallaig
Portree
Stornoway
Lerwick
Kirkwall
Thurso
Wick
Stranraer
Ayr
Dumfries
Carlisle
Newcastle
Edinburgh
Glasgow
Stirling
Perth
Dundee
Aberdeen
Inverness
Leeds
Manchester
Liverpool
Birmingham
Cardiff
Bristol
London
Cambridge
Norwich
Ipswich
Southampton
Plymouth
Exeter
Dublin
Belfast
Cork
Galway
Limerick
Waterford
Wexford
Rosslare
Cobh
Kilkenny
Sligo
Donegal
Derry
Belfast
Dublin
Cork
Galway
Limerick
Waterford
Wexford
Rosslare
Cobh
Kilkenny
Sligo
Donegal
Derry
Belfast

Durris Working Plan

NOTES ON PART I

1. Chapter 4 Para. 2. Restrictive Convenant.

   v. Cairn-mon-earn H.E. Board corridor now liquidated in favour of new access road. A note to this effect may be appropriate.

2. Chapter 2 (b) Soils.

   I refer to "occasional discontinuous iron pan". But under (f) Site Classification: By the Soils Para. 2 an addition to my sentence has been made reading "... the final stage of which is the continuous iron pan". Is it continuous? I don't think so, but the two statements should be consistent.

3. Chapter 19 (b) Labour

   I do not know what has happened to the age group percentages for they are not in order. For example, men 60-65 years, 1 out of 22 is shown as being 24%. It should be 4% and the complete column after Number Employed should read:-

%age of Total
3
9
9
4
24
9
14
24
4
100%

NOTES ON CHAPTERS 24-26 PART II

1. Chapter 24 (d)

   Reserves of Plantable Land are shown as 1,103, with a further 100 acres on Drum Castle under negotiation.

   But WP 11 and 12 show land remaining to be planted as 1,394 acres. This was when the total forest area stood at 6,623 and 22 acres pre entry (and planted).

   The 100 acres under negotiation at Drum are not included in the figure of 1,394.

   Presumably the reserve shown here should agree with that in WP 11 and 12?

2. Chapter 26 (a) Amenity

Last para. Horse riders have knocked such hell out of newly rolled roads at Maryculter that their passage over them has been forbidden.

(g) Marketing

".... Timbuyers, who bought the F.Y. 62 sale".

Is Part II also meant to be written as at 30.9.61? In which case this paragraph will appear to be prophetic.

3. Larch underplanting

If this were done in F.Y. 66 on a giant scale it would make the lion's share of a planting year, and leave a F.Y. 67 planting programme. Percentages of plants in the F.Y. 66 programme, based on:-

(i) 160 acres first planting
(ii) 350* acres Larch underplanting

Total 510 acres @ 800 plants per acre, would be:-

	M	%age
P.C.	172	28
S.S.	154	26
N.S.	42	7
H.L./J.L.	6	1
D.F.	182	30
A.G.	28	5
Hwd.	14	3
	598	100

* Equivalent to only 140 acres in terms of plants used.

This would leave a F.Y. 67 planting programme of 104 acres to complete all available land, and would entail the supply of the following plants not required for the reduced F.Y. 66 first planting programme:-

Species	Acres	M	%
S.P.	4	9	5 (with E.L.)
P.C.	50	100	49
E.L.	1	2	-
H.L.	3	5	2
S.S.	46	90	44
	104	206	100

As you know, we are already underplanting J.L. and diseased E.L. on a small scale. But I do not favour continuing to do so. I am sure the operation will be better controlled if done on a large scale. I therefore propose assembling considerable areas for underplanting, say once in each decade.

In F.Y. 65 therefore there will be the maximum larch area available, which I

put at 350 acres, for very heavy thinning, ready for underplanting in P.66.

There are areas like Slug Wood, already 32 years old where underplanting should go forward without delaying until F.Y. 66. It may be advisable to continue treating such areas individually and underplanting them on the small scale at present employed.

My present modest demand of 42,000 plants for underplanting in F.Y. 66 is sufficient for only 50 acres. This area might be treated between now and F.Y. 66 when the much greater demand listed on p.4 above would be required for the main underplanting year.

(Signed) P. F. McIntyre

29. 1. 63.

This seems quite a good effort and important

Don't number pages.

File with Durris W.P. papers

× stability
× replacement
× thinning
× weeding
× planting

Durris - Preliminary Working Plan Report

1. Summary of Facts to be presented in Part I of Plan

(a) Forest Conditions and Potential

At lower elevations forest soils are well developed. Although Fomes is present Q.C. III crops should be grown at rotations of 50-60 years. S.S., N.S. and D.F. will be the main constituents.

At higher levels greater exposure and poorer soils are expected to support Q.C. IV-V crops of S.S., N.S. and P.C.

(b) Existing crops. Volumes and Increment

(i) Total planted acreage is 4,635 at 30.9.61, of which 4,589 acres are conifers.

(ii) There are 1,394 acres still to plant.

(iii) Measurable volume is 992,000 h.ft. with a conservative estimate of 110,000 h.ft. C.A.I.

(c) Choice of species and techniques.

(i) S.S. occupies one-third of the planted area, mounded on grassy sites, notched on dry calluna, sometimes with S.P. Today it is planted on the ridge of tine or drain ploughing in association with P.C.

(ii) N.S. has been used extensively, mounded on grassy flushes.

(iii) S.P. was much used formerly on calluna, pure or to nurse S.S. Its place today is filled by P.C., which will be increasingly used on poorer dry sites.

(iv) J.L. occupies many highly fertile sites on which it cannot be considered economical. Its speedy replacement by D.F. or other higher volume producer is envisaged.

(v) D.F. has a minor place on deep soils. It will be extended to sites meantime occupied by larch, as in (iv) above.

(d) Reserves of plantable land are 1,394 acres.

(e) Produce and Markets

Pitwood and boxwood, sold standing locally. because standing sales produce best stumpage values

(f) Staff and Employment stands at 22, due to fall to 14 on completion of planting in 1966.

(g) Engineering Works

Of the total road system of 66 miles 29 have been built.

Current roading costs are nearly £2,000 per mile

Roading density overall is 7.1 miles of road per square mile of forest. 7.1 on 66 or 29. Is it on present area or total future area. Which are adequate for the 1,000 acres in production, 3000 acre of the present planted area are unroaded.

(h) Estate

In addition to two foresters houses accommodation is provided for six workers. This is adequate.

(i) Financial why

Accepting Q.C. IV S.S. crops as typical, profitability assessments on rotations of 45 and 50 years give the following net discounted revenues per £100 of initial capital expenditure:-

On 45 year rotation = £40

On 50 year " = £42

What about the other species since S.S. is only ⅓ of the area. Where is the peak?

2 Objects of Management

(a) The situation

(i) 4,635 acres are planted of the total forest area of 6,623 acres.

(ii) Little further expansion of the forest can be foreseen.

what is meant by productive

(iii) The proportion of forest in a productive stage will increase rapidly (by how much) from the present 16%.

(iv) S.S., N.S. occupy 45% by acreage. These species will remain the main forest constituents.

(v) S.P. at 28% will be reduced gradually in mixture with S.S. Its environment is considered unsuitable.

(vi) D.F. will occupy much of the 14% meantime under J.L. as this is replaced.

(vii) P.C. will assume increasing significance as a pioneer with S.S.

(b) **The Problems Stated**

(i) S.S. though on marginal sites is the keystone to the productivity of the forest. It must be maintained in the face of the following problems:-

Are these not common to all species.

(i) Liability to windthrow through shallow rooting.

(ii) Susceptibility to Fomes.

(iii) " " defoliation by Neomyzaphis.

(iv) Loss of vigour following sudden exposure.

Optimum? financial rotation is 50 or more. S. Fomes the reason.

(ii) With the points above in mind, a short rotation - say 40-45 years - may be the rule. Thinning technique must aim at getting the main crop to millable size by that age.

Why will not sawmills accept anything less than 12" or is the price scale gradient steeper from 12"

In this connection final crop trees of 12" b.h.q.g. are considered acceptable. At the same time the site expectations are only those of a Q.C. IV. crop. It requires a Q.C. II crop to produce final crop trees of this size at 45 years.

(iii) Considerable areas of J.L. occupy highly fertile sites. These must in the future carry D.F. The speediest and most economical way to effect this must be sought.

(c) **The Local Objects of Management**

This is not of any urgency

(i) To create and maintain a stable sustained yield high forest with S.S. and N.S. as its main constituents and P.C. and D.F. important secondary species.

long term aim

These choices are reasonable but is NS or good choice what is the evidence

(ii) To maintain crop stability by:-

a. Appropriate thinning techniques

b. Attention to drainage

c. Prompt replanting of windblow

nothing to do with stability

d. Replacement of poor stands

e. Diversification of species

This is not an object at all

~~(iii) To produce final crop trees of about 12" b.h.q.g.~~

to produce more amount of sawlog material and to employ a thinning regime compatible, with the above limitations, to achieve this aim

(iv) To encourage the prosperity of a local timber industry

(v) To contribute to the beauty of the landscape.

3. **Outline of Principal Prescriptions for Part III**

(a) **Amenity**

The present policy of enhancing the beauty of the landscape will be continued by

(i) Avoiding straight rides and species divisions

(ii) Making belts and blocks of irregular outline

(iii) Planting amenity hardwoods How many and how

(iv) Retaining natural hardwoods

(v) Access to the public will not be discouraged.

(b) **Organisation**

(i) Supervisory staff will be one forester and one assistant forester.

(ii) The forest will comprise one working circle and one felling series.

(iii) There will be no felling series

(iv) The only clear felling will be that resulting from windblow

(v) Three blocks will be recognised for cyclic repetition of the following operations:-

a. Thinning

b. Drain maintenance

c. Road maintenance

d. Brashing

(c) **Planting Rate** will be at 300 acres annually until the completion of planting in F.Y. 66.

What about the replacement of JL by DF

The forecast of species shows the following trends in the two major species to be used:-

(i) P.C. rising from 30% to 70%

(ii) S.S. falling from 60% to 20%

(d) **Silvicultural Operations**

(i) The main considerations will be:- what thinning technique

a. To promote crop stability by thinning technique

b. To get the main crop to millable size before its loss through wind

c. To maintain drainage in Spruce stands.

d. To replace by underplanting poor pine and unthrifty larch stands.

(ii) The techniques referred to in (d) (i) a.-d. above. are as follows:-

1. Thinning

a. Will start about three years earlier than heretofore: around 18 years

b. Early removal of wolf trees to allow development of some small trees as understorey. ?

b + c amended at variance

c. Acceptance of some big rough trees for stability.

d. Vigorous dominants to be allowed crown and root development from earliest opening.

2. Treatment of Margins

a. All young woods will be so thinned as to give the two outer rows of trees with deep crowns and spreading roots.

Alternate trees in these rows will be removed in advance of thinning.

b. In new planting the outer 2-3 rows will be planted at double spacing.

c. Margins will be completely ploughed for 20 ft.

3. Felling and Clearing Windblow. Holes will be replanted as soon as possible, diversifying the species where practicable. where

4. Drainage

a. Careful attention in the present block system will be continued.

b. Cut-off drains around the edges of windblown holes will be dug before replanting, by mechanical digger.

5. Planting. All remaining land is of low fertility. Whether tine or drain ploughed, the planting position will be through the slice.

(e) Regulation of the Yield

(i) As far as possible thinning will follow the existing blocks.

(ii) Essential first thinning outside the blocks will receive treatment out of turn.

(iii) Production in the next decade will be from thinnings and windblow. No

fellings to achieve normalcy are proposed.

(iv) Yield from thinnings for the next six years rises from 59,000 c.ft. in F.Y. 62 to 84,000 in F.Y. 67. why acreages - also prop^n of increment. Av yields per acre. reasons for high or low yields

(f) Roads

The forest road system is laid out and approved. 66 miles of road give 1 mile to 90 acres, or 7.1 miles to a square mile of forest.

37.1 miles are still to be built, as follows:- The reason for this should be explained

F.Y. 63-67	8.1 miles	
F.Y. 68-87	29.0 "	not too serious in view of proposed changes
	37.1 "	

A consideration of the remaining areas to plant reveals a roading density in this area of 6.4 miles per square mile. This conforms to the density specified by reference to the Roads Density Alignment Chart of 6.3 miles per square mile.

(g) Marketing

why see 1(e)

Produce will be sold by standing sale. Boxwood markets are relied on for the major outlet. Pitwood may be hard to dispose of, and a pulpwood demand within range might ease this problem. may become easier when pulp supplies are drawn from other parts of the country

(h) Protection

(i) Fire Normal protective measures are encouraged by the scattered character of the forest. statement of present facts - not a prescription. Provisions of Fire Plan will be implemented.

(ii) Vermin Two trappers are expected to cope with rabbits, hares and roe deer, aided by an active Rabbit Clearance Society.

(iii) Insects Neomyzaphis is a recurrent defoliating scourge in spruce areas.

(iv) Fungi Stump creosoting will continue against Fomes in all thinning areas.

(i) Staff and Labour

(i) Supervision will be by one Head Forester and an Assistant Forester.

(ii) The industrial staff is expected to fall from 22 to 12-14 by the end of the decade. With the completion of planting programme in 1966 and if no further land comes in there will be work for only 14. Planting to be run down in prop^n to run down in labour

(j) Housing is adequate.

(1) <u>List of Priorities</u>

1. Maintenance of a suitable thinning regime.
2. Careful drain maintenance.
3. Early underplanting of larch stands.
4. Speedy replanting of windblow.
5. Early heavy thinning of margins.
6. Maintenance of a regular and rising output of material from thinnings.
7. To plant the last reserves of land.

Durris

APPENDIX Ia

Sheet 1

Profitability Assessment for an Individual Crop

Yield Table Data	Mai at chosen rotation	Price level
Species S.S.	Rotation 45	Thinnings 1" @ 4"
Yield Table FC	ftMAI 163	b.h.q.g.
Q.C. IV	Reduction Factor .7	1/6 @ 9"
Max mai. 166 at 50 yrs.	Net mai 114	Maincrop 3" higher

II. Period years from planting	1-5	6-15	16-25	26-35	36-45		
III. Expenditure per acre by periods						Total	
a. Land	4					4	
b. Establishment	50					50	
c. Brashing Cleaning			3			3	
d. Roads	3		19			22	
e. Protection and road maintenance		5	10	15	15	45	
f. Other							
g. Sum a-f = total expenditure	57	5	32	15	15	124	£/acre
IV. Expected volume yields by periods of standing values							
a. Thinnings h.ft.			380	1380	1120		
b. Maincrop fellings h.ft.					4460	Net	
c. Net vol. of thinnings ((a) x reduction factor) h.ft.			266	966	784	Yield 2016	
d. Net vol. main crop ((b) x reduction factor)h.ft.					3122	3122	
						5138	h.ft./acre
e. Price standing H.ft. thinnings £			.038	.05	.075		
Price standing H.ft. maincrop £					.087	114	= mai at 45 yrs.
V. Income per acre by periods						Total	
a. Value of thinnings (ivc x ive)			10.1	48.3	58.8	117.2	
b. Value of maincrop ivd x ivf					271.6	271.6	
c. Other income							
d. ENet rotation value of land roads					26	26	
e. Sum a + b + c + d = total income			10.1	48.3	356.4	414.8	£/acre
VI. Balance of income and expenditure						Total	
a. Net income +				33.3	341.4	374.7	
b. Net expenditure -	-57	-5	-21.9			-83.9	
c. Net result for rotation a-b = Grand total of V - Grant total of III						290.8	
d. Net annual income = c ÷ rotation (45 yrs.)						6.46	£/ acre
VII. Discounted income (+) and expenditure (-)							
a. Years from planting	2	10	20	30	45		
b. Discount net income or expenditure (from VIa and VIb)	1.186	.9	.638	.453	.27		
c. Using discounting factor for 3½% multiply entries in VIa to give discounted net income				15.1	92.2	107.3	+21.2

APPENDIX Ia

Sheet 1 (contd.)

	1-5	6-15	16-25	26-35	36-45		
VII. (contd.) d. Multiply entries in VIb to give discounted net expenditure	+67.6	-4.5	-14			-86.1	
VIII. Net discounted revenue per £100 initial establishment expenditure						£	
a. NDR onrotation of 45 yrs.						+21.2	per acre
b. Initial establishment expenditure III b + d + e + f in yrs. 1-5 =						53	per acre
c. = 100(a) ÷ b = NDR per £100 of initial establishment expenditure =						+40.0	per £100

IX. Bases for assumptions

a. Rotation Maximum NDR @ 3½%

b. Expenditure: Protection £0.5'ac'p.a.: Roads: 1ml'sq.ml. @ £2000 ml. at first; additional 6 mls. @ 20th yr. = £22' ac. Road maint. = £20'per ml'p.a.= -£0.2'ac'yr on full road system

c. Price

d. Others

Rotation 50 yr.
YT MAI 166
Reduction Factor .7
Net MAI 116

II	1-5	6-15	16-25	26-35	36-45	46-50			
III Readings as per Appendix Ia	4 50 3	 5	3 19 10	 15	 15	 8		Total 4 50 3 22 53	£ acre
	57	5	32	15	15	8		132	
IV			380 266 .038	1380 966 .05	1120 784 .075	470 4930 329 3451 .087 .095		Net Yield 2345 3451 5796 116	H.ft. acre = MAI at 50 yrs.
V			10.1	48.3	58.8	28.6 296.6 26		Total 145.8 296.6 26	
			10.1	48.3	58.8	351.2		468.4	£ acre
VI	-57	-5	-21.9	33.3	43.8	343.2		Total 420.3 - 83.9 336.4 6.73	£ acre
VII	2 1.137 -64.8	10 .864 -4.3	20 .612 -13.4	30 .434 14.5	40 .308 15.5	50 .218 74.8		104.8 -82.5	+ 22.3
VIII								£ +22.3 53 +42.0	per acre " " per £100
IX See calculation for 45 years rotation									

APPENDIX II

Durris Road Density Assessment

1. Location: Durris Acquisitions 2 and 3.

2. Area: 1203 acres plantable.

Road system: 961 chains.

Proposed density: 1203 acres with 961 chains roads

$\therefore$ 1 sq.ml. of forest has $\frac{961 \times 640}{80 \times 1203}$ mls. roads

= 6.4 miles of roads

Assessment by Alignment Chart:

Factors m = Construction costs = £2000 per mile

3½% of £2000 = £70

Annual maintenance cost = £20 per mile p.a.

$\therefore$ Total annual road charge m = £90 per mile

h = 1½d per h.ft. per 100 yards

v = net m.a.i. for QC IV SS @ 45 yrs. = 163

" " " " III PC @ 50 yrs. = 73

Weighted for %age: SS 163 x $\frac{70}{100}$ = 114

PC 73 x $\frac{30}{100}$ = 22

Gross m.a.i. = 136 h.ft.'ac'p.a.

Reduction factor = 0.8: .8 x 136 = 109 = net m.a.i.

$\therefore$ v = 109

k = 0.48

From Alignment Chart recommended road density = 6.3 miles per square mile.

(c'f 6.4 miles per square mile as laid out)