

Chapter 1 - Introduction

(a) Situation and Extent

The Plan embraces Creagnaneun and Port Clair Forests, which are situated in the Parishes of Urquhart and Glenmoriston and Boleskine and Abertarff respectively. The Working Plan area extends from a point 1 mile north-east of Port Augustus along the north-western slope of the Great Glen in a north-easterly direction to Glenmoriston where it marches with the Inverwick Forest on the south side of the Glen, then from Allt na Criche on the north side of Glenmoriston eastwards for approximately 1 mile to Invermoriston and then north-eastwards for 7 miles along the north-west slope of the Great Glen as far as the Grataig Burn.

The Forest Office at Creagnaneun Forest is situated at Allt Saigh. The Forest Office at Port Clair Forest is situated on the main Inverness to Port Augustus road four miles north-east of Port Augustus.

The Working Plan area as at 30th September, 1965 was:

	<u>Total Area</u>	<u>Planted Area</u>	<u>Area to Plant</u>
Creagnaneun	2,139	1,494	81
Port Clair	5,545	2,428	41
Totals	7,684	3,922	122

The National Grid References of the Forest Offices:-

Creagnaneun Forest Office	-	36	457193
Port Clair Forest Office	-	36	414136

(b) Civil Administration

<u>Forest</u>	<u>District Council</u>	<u>County Council</u>	<u>Parish</u>	<u>Parliamentary Constituency</u>
Creagnaneun	Aird	Inverness-shire	Urquhart & Glenmoriston	Inverness
Port Clair	Aird	Inverness-shire	Boleskine & Abertarff	Inverness

(c) Nearby Towns

The nearest town is Inverness with a population of 29,000, 22 miles from Creagnaneun and 29 miles from Port Clair. Inverness is also the nearest railhead to both forests.

The nearest villages are Drumnadrochit 7 miles east of Creagnaneun, Invermoriston in the middle of the working plan area, Port Augustus 4 miles south-west of Port Clair and Spean Bridge 26 miles south-west of Port Clair.

(d) Communications and Transport

(i) Railways

Port Augustus no longer has a railway line but still has a yard to and from which goods may be consigned. However, goods must be confined to articles which can be easily manhandled onto a lorry which calls once daily from Spean Bridge where there is a railway station. Spean Bridge has both passenger and goods facilities which include a weigh bridge. The weigh bridge of which British Railways have use belongs to D. MacFarlane of Spean Bridge.

Inverness Railway Station has adequate facilities but Spean Bridge would be a better point from which to rail timber on account/

account of the traffic congestion in Inverness.

(ii) Roads

The Working Plan area is well served by county roads. The main Inverness to Fort Augustus road A.82 forms the south-east boundary of a considerable part of the Working Plan area and the Invermoriston to Cluanie road A.387 forms the south boundary of the Glenmoriston part of Creagnaneun Forest, but is separated from the Glenmoriston part of Port Clair Forest by the River Moriston.

A minor road maintained by the county, but referred to in the feu charter as a public right of way, runs through part of Creagnaneun Forest from Invermoriston to the Achnaconeran Crofts.

(iii) Ports and Harbours

The nearest port is Inverness. This port is capable of dealing with vessels of up to 2,500 tons of cargo with a maximum draught of 19 feet.

(iv) Other Facilities - Caledonian Canal

Ships with a maximum length of 150 feet, beam of 35 feet and draught of 13 feet 6 inches (fresh water) can pass through the Caledonian Canal. However if the maximum draught does not exceed 9 feet a vessel of 160 feet long can be accommodated.

At Fort Augustus there is a stone built pier with a rather narrow access, but there are no mechanical loading facilities available.

(e) Maps

The following Ordnance Sheets cover the Working Plan area:-

1. 1" O.S.S. Nos. 36 and 27.
2. 6" O.S.S. Inverness-shire Nos. LIII, LIV, XLI and LXVIII.

Chapter 2 - Site

(a) Geology

In 1938 a geological survey was carried out by the Geological Survey of Great Britain (Scottish Office) over the working plan area. The two forests embraced by the plan were surveyed separately and as there are fundamental differences between the two they will be treated separately in this section. The report on the surveys, excluding analytical detail, is as follows:-

Port Clair

Solid Geology

The solid rocks comprise various types of schist - mainly of the Moine series. The principal type is a siliceous granulite which is a compact rock in which quartz is dominant, feldspar abundant, but mica is present only in small quantities.

The schists are occasionally intruded by thin acid veins (quartz and granite) and thicker veins of hornblende composition.

On Loch Ness the dip of the beds is northwards whilst on Glenmoriston it is southwards, so that the structure of the rocks at Port Clair is that of a shallow syncline.

Drift Geology

The solid rocks are everywhere overlaid by drift of varying thickness and is for the most part a Grey Boulder Clay charged with schist pebbles. This covering of boulder clay varies in depth from 12 feet at low levels to 20 feet on the plateau.

At levels between 100 and 700 feet this Grey Boulder Clay is overlain by a reddish brown boulder clay. On Port Clair this red boulder clay is most in evidence on Loch Ness side but has not been noted further west than a point 1 mile west of Dalcattaig.

The valley of the River Moriston is filled with characteristic hummocky moraines and fluvio glacial river gravels also occur there. Loch Ness is fringed with a narrow shelf of gravel, 30 to 50 yards width at a height of about 100 feet O.D. It generally merges with the red boulder clay but is continued to a somewhat higher level on the stream sides.

Creagnaneun

This forest differs from Port Clair in two important respects.

- (1) While schist is also present (mainly south west of Allt Saigh) the greater part of the area is occupied by sandstone of the Old Red Sandstone period.
- (2) The planted area is mainly confined to a driftless slope rising steeply from the shore of Loch Ness.

Drift Geology

As stated above most of the forest is free of drift. An exception is at the south west end of the forest where a certain amount of Grey and Red Boulder Clay is present on the slopes above Invermoriston.

(b) Soils

There is no published soil survey for the working plan area, but broadly speaking there are four zones with all shades of gradation from one to the other.

1. Mineral Creep Soils derived from the Old Red Sandstone

This zone is confined to Creagnaneun Forest covering most of the forested area from Allt Saigh eastwards. It is a true mineral soil and appears to have been formed 'in situ' from the underlying rock and on account of the steep nature of the ground the tendency is for the soil to accumulate to the greatest depths at the foot of the slopes and in the hollows; hence creep soils.

The soil is red brown in colour and of a coarse sandy nature, very stony and usually overlying masses of rock fragments. There is no evidence of any leaching.

2. Mineral Creep Soils derived from the Glacial Deposits

This zone occurs chiefly west of the Allt Saigh in Creagnaneun Forest and over the whole of Port Clair Forest on the lower slopes, but excluding an area at the west end of the Glenmoriston section. It appears to have been formed from the Red Boulder Clay which exhibits a good deal of creep. The soil is reddish brown in colour, sandy in texture and readily permeable.

The Glenmoriston section of Port Clair is very bouldery on account of the weathering of the precipitous cliffs above which render the slopes prone to landslides.

3. Shallow Peat Soils

The shallow peats overlying mineral soils and morainic knolls are found mostly on the less precipitous upper parts of the planted area where conditions are more arid, and also at the west end of the Glenmoriston section of Port Clair. On the whole their quality is quite good, but leaching does occur in places.

4. Deep Peat Soils

The deep peats can be divided into:

(a) Flushed Peats. These are not very extensive on the planted area, and are found on small flats at all elevations: they are of good quality and produce good growth.

(b) Fibrous Peats. These are extensive on the unplanted areas of the forests and are of poor quality, the peat often sitting directly on bedrock. In only a few places has planting taken place on these peats and in each case the results have been very poor to date.

(c) Topography

A large proportion of the plantations have been established on steep and often bouldery slopes. Over the whole of the area there are numerous rocky outcrops which combined with the steepness of slope have led to difficult and expensive road making in parts.

The aspect is very variable. The Loch Ness side sections of both Port Clair and Creagnaneun have a south east aspect. On Port Clair this aspect swings from south east, through east to north in Glenmoriston. On Creagnaneun the south east aspect swings to the south in Glenmoriston and the Glen formed by the Allt Saigh has north and south aspects.

The elevation is very variable. On Creagnaneun Forest it varies from 87 feet at the Grataig Burn in the east, to 1,243 feet at Meall na Sroine and to 1,355 feet at Creagnaneun. On Port Clair Forest it varies from 60 feet near Invermoriston Pier to 1,559 feet at Sron na Muic and 1,986 feet at Buraich.

On/

On Creagnaneun Forest the plantings go up to about 1,000 feet at Allt Seigh and rather higher on Creagnaneun itself but on Port Clair the planting line is generally lower, only reaching 1,000 feet at the west of the Glenmoriston section below Meall a Bhuic.

(d) Meteorology

The nearest meteorological station is at Fort Augustus. The average rainfall in the working plan area is 40 inches: it is fairly evenly distributed through the year although drought conditions occur at the east end of the area in years of below average rainfall. Snowfalls are not usually heavy but frosts can be severe.

The prevailing wind is south west following the trough of the Great Glen. The exposure on the whole is not severe but windblows have occurred.

(e) Vegetation

Prior to Forestry Commission Management the whole of the working plan area was covered by tree growth. Much was broadleaved scrub - Oak and Birch with Hazel and some Juniper, but there were exploitable conifer stands, the most notable of which was 500 acres of Scots pine on Port Clair at the west end of the Glenmoriston section.

The surface vegetation can be divided into three main zones:-

1. Grass-Herb Bracken zone.
2. Calluna-Grass Herb zone.
3. Calluna-Molinia-Scirpus zone.

These three types of vegetation are the basis of the Site Type classification.

Prior to the enclosure of the area for afforestation the ground vegetation was exposed to grazing and browsing by deer, sheep and rabbits. From a forestry point of view it is unlikely that this had any degrading effects on the soil and it could have been beneficial by keeping the ground vegetation down for planting.

The exploitation of the timber on the area undoubtedly had an effect on the vigour of the ground vegetation and the removal of the Scots pine in Glenmoriston would have given a boost to the calluna and vaccinium.

Forest operations since enclosure have not changed the ground vegetation radically except on the shallow peats where draining has tended to increase the calluna and reduced the molinia and scirpus.

It is noteworthy that part of Port Clair Forest came under the survey of Native Pinewoods by Stevens and Carlyle. The various plant communities were studied in great detail and ones corresponding to their Field Layer Communities 1, 2, 3, 4, 5, 6, 7, 9, 15, 16, 17 and 19 are stated to be present on Port Clair.

However these communities are far too detailed for the basis of a general site classification, particularly as they refer to only a small part of the area.

(f) Site Classification

There is no recognised site classification for this area, and since the number of tree species already used and likely to be used in future is somewhat limited a fairly simple classification based on the Soil Types, the three general Vegetation Zones and slope has been used.

Zone 1/

Zone 1. Grass-Herb-Bracken which is confined to the lower slopes.

<u>Site 1.</u> Lowest slopes characterised by Bracken with <u>Rubus</u> species, Grasses (<u>Deschampsia flexuosa</u> and <u>Agrostis</u>) with rich herbaceous flora including <u>Primula vulgaris</u> and <u>Viola canina</u>. <u>Site 2.</u> Higher up characterised by Bracken and Grasses being co-dominant and fewer Herbs. <u>Site 3.</u> On the flats characterised by <u>Deschampsia caespitosa</u> with patches of <u>Spiraea ulmaria</u> and <u>Scabious</u> - some <u>Juncus</u>.	Moist concave slope with mineral creep soil. Dryer convex slope with mineral soil. Wet flat ground with mineral creep soil.	Best suited to Sitka spruce and Douglas fir. Douglas fir particularly where stony. Best suited to Douglas fir. Best suited to Sitka spruce (and <u>Abies grandis</u>).
--	--	---

Zone 2. Calluna-Grass-Herb which is generally above Zone 1 but usually below the 700 feet contour.

<u>Site 4.</u> Lowest part of the zone with Bracken and Grasses co-dominant with patches of <u>Calluna</u> and sometimes <u>Erica cinerea</u>. <u>Site 5.</u> Higher up <u>Vaccinium myrtillus</u> and <u>Calluna</u> with some Bracken and Grasses. <u>Site 6.</u>	Dryish convex slope with a thin layer of peat over mineral soil. Moist concave slope with a thin layer of peat over mineral soil.	Best suited to Scots pine and European larch with some Douglas fir. Best suited to Scots pine and Silver firs and some Sitka spruce.
--	---	--

Site 5. At the highest limit generally <u>Calluna</u> with Hypnaceous Mosses, <u>Potentilla erecta</u> and sparse Bracken.	Damp convex slope with a thin layer of peat over mineral soil.	Best suited to Scots pine and hybrid larch.
--	--	---

Zone 3. Calluna-Molinia-Scirpus - Confined chiefly to the upper limits of the plantations and the poor areas lower down.

Site 7. Flushed areas with pure <u>Molinia</u> and <u>Myrica Gale</u> .	Wet, concave slopes and flats with deep flushed peat.	Best suited to Sitka spruce.
Site 8. On high rocky ridges <u>Calluna</u> dominant with very sparse <u>Molinia</u> and <u>Scirpus</u> .	Moist, convex slopes with fibrous peat.	Best suited to Scots pine and <u>Pinus contorta</u> .
Site 9. Flats and hollows with <u>Scirpus</u> and <u>Erica tetralix</u> co-dominant.	Wet flats with deep fibrous peat.	Best suited to <u>Pinus contorta</u> and Sitka spruce.

Statement of Land Utilisation

Working Plan Area **Port Clair**

As at 30.9.19	Plantations					Land to be planted					Areas in acres					
	Acquired (2)	Planted by F.C.			In hand (6)	For Afforestation		For Replanting		Total (10)	Nurseries (11)	Agricultural and Grazing Land (12)	Holdings (13)	Un-plantable (14)	Other (15)	Total (16)
		Before 30.9.1946 (3)	Since 30.9.1946 Afforested (4)	Replanted (5)		Tenanted (7)	In hand (8)	Tenanted (9)								
(1)																
60	-	1,815	321	217									14	3,129	4	5,500
61 Resumed P.62	-	1,815	321	217			+ 41 - 41		+ 41 - 41				14	3,129	4	5,500
62	-	1,815	321	258									14	3,088	4	5,500
Aug.					+ 41				+ 41					+ 4		+ 45
63	-	1,815	321	258	41				41				14	3,092	4	5,545
63	-	1,895	36	497	41				41				14	3,058	4	5,545
+ 34 Adjustment to Balance figures resulting from Resurvey as shown on W.P.4 30.9.61																
															</	

As at 30.9.19	Plantations					For Afforestation		Land to be planted For Replanting		Total (10)	Nurseries (11)	Agricultural and Grazing Land (12)	Holdings (13)	Unplanted (14)	Other (15)	Total (16)
	Acquired (2)	Planted by F.C. Since 30.9.1946			In hand (6)	Tenanted (7)	In hand (8)	Tenanted (9)								
		Before 30.9.1946 (3)	Afforested (4)	Replanted (5)												
(1)																
59	-	1,364			30		192		222				2	547	4	2,139
P.60			+ 5	+ 26	- 5		- 26		- 31							
60	-	1,364	5	26	25		166		191				2	547	4	2,139
P.61			+16	+ 14	-16		- 14		- 30					+ 11		
As per summary																
61	-	1,353	21	40	9		152		161				2	558	4	2,139
P.62				+ 40			- 40		- 40							
62	-	1,553	21	80	9		112		121				2	558	4	2,139
P.63				+ 40			- 40		- 40							
63	-	1,353	21	120	9		72		81				2	558	4	2,139

Working Plan Area **PORT CLAIR**[illegible]

Working Plan Area **CREAGNANEUN**

[illegible]

Chapter 3 - History

(a) Local History

Glenmoriston is the only population centre embraced by the working plan area and the following historical notes refer to Glenmoriston although the Forests have the greater part of their area in the Great Glen.

Glenmoriston was part of the old lordship and barony of Urquhart and the earliest reference to this barony is in a deed dealing with the transfer of the property to William, Earl of Sutherland. It appears to have had a number of owners thereafter until it was reacquired by the Crown in 1455. At this time the lairds of Grant were Crowns Chamberlains over the area. In 1509 the lordships and barony of Urquhart was granted to John Grant of Freuchie and his two sons, the barony of Glenmoriston passing to the eldest son. It thus remained the property of the Grant family until 1715 and during this time the laird of Freuchie held the office of Forester of the Royal Forest of Cluanie.

In 1715 Ian a' chragan (John of the Rock) having taken up the Stuart cause forfeited his estates. The commissioners of forfeited estates had difficulty in running the estate and when their power expired in March 1725 they had been unable to sell the estate because they could not assess its true annual value. However the estate was eventually sold in 1730 to relatives of the old family who eventually returned it to a direct descendent of the original owner.

An Act of Pardon in 1747 did not include Grant of Glenmoriston and the Port Clair section passed into the possession of the Lovat Family and was not reacquired by Glenmoriston Estates until near the end of the 19th Century.

The Forestry Commission then acquired the bulk of the working plan area from Glenmoriston Estates and the Countess of Seafield between 1919 and 1926.

There is no doubt that the area has been settled from the earliest times because the geographer, Ptolemy in the second century made reference to the 'Caledonii' who inhabited Glenmoriston and many of the Glens to the East and West. Direct evidence of early settlement is given by the remains of a small ^{unexcavated} fort at Dunscriben which is situated near Bunloit and only a short distance from the forest fence.

From the early times until the '45 Glenmoriston was the scene of many clan feuds since it was very exposed to depredations from the neighbouring clans in the West Highlands, being somewhat isolated from Urquhart Castle which was the main strong hold of the area.

One of these feuds followed the 'Battle of the Shirts' when John of Moidart laid waste the Glen as a reprisal, but the most notable skirmish was the conflict between the MacKenzies of Ross-shire and the MacDonnells of Glengarry at Lon a Fola in 1602 following the burning of the Church of Kilchrist. In 1653 General Monk passed through the Glen during the Glencairn rising.

In 1746 after the Battle of Culloden Prince Charles Edward Stuart sought refuge in Glenmoriston and was guarded by the 'seven men of Glenmoriston'.

In 1756 a weaving factory with 6 looms employing 40 girls was built by the Trustees of Manufacturers and Fisheries but it was closed in 1791.

By 1773 the laird of the Glen had raised the rents to the point of depopulating his farms and in that year there is evidence of 400 highlanders leaving Glenmoriston and the surrounding Glens for America. This was the start of the Highland Clearances and the Statistical Accounts show a gradual decline in the population from 1811-1831.

The building of the Caledonian Canal did not directly affect Glenmoriston but it is certain that the Glen provided much timber for its construction and stone from the quarries at Ruisky was used to build the locks at Fort Augustus.

By the time the New Statistical Account was compiled in 1835 road building in the area had been completed and there was a continuous road from Inverness via Glenmoriston to Kyle and Skye.

Books referred to in writing this chapter.

The Statistical Account of Scotland - Volume 20 1798

The New Statistical Account of Scotland - XIV
Inverness and Ross and Cromarty 1835

The County Histories of Scotland - Inverness -
J. Cameron Lees

Ordnance Gazetteer of Scotland - Volume I

New Ways through the Glens - A.R.B. Haldane

West Highland Survey - Darling

Wade in Scotland - J.B. Salmond

Native Pinewoods - Stevens and Carlyle

Urquhart & Glenmoriston - MacKay

Reprint from 'Forestry' Volume IX No. 2 1935
Port Clair - James Fraser.

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

There is evidence to show that the ancient forests of the Great Glen and Glenmoriston extended over a much greater area than is at present wooded; this is shown by the numbers of roots and stumps exposed in areas of eroded peat. There is no evidence of planned management of woods before 1700 but as early as 1563 there was concern about the devastation of the woods and Lord Lovat and the Laird of Grant obtained an order from the Earl of Moray as Sheriff of Inverness-shire prohibiting the cutting and peeling of trees in the neighbourhood of Loch Ness (Fraser 1883).

In the 18th Century there were fellings of birch and other species for the production of charcoal for smelting iron ore and later timber was exported to the Carron Iron Works for this purpose.

Haldane records that in 1818 the bridge over the River Moriston at Torgoyle was completely destroyed when a flood swept away 4,000 birch logs cut ready for floating. These birch logs were destined for conversion into herring barrel staves for the fisheries of the N.E. Coast.

Evidence of the importance of timber to Glenmoriston Estates in the past is shown in the attached appendix the information for which was provided by the present Factor, Mr. John Grant.

From the earliest times until the breakdown of the Clan system the alluvial flats and better quality high ground was grazed by cattle and some agriculture was carried on. In the last quarter of the 18th Century cattle were largely replaced by sheep with consequent large scale moor burning. This resulted in a reduction of the agricultural area and a cessation of the natural regeneration of the woods, and this is more or less the situation as it exists today outside the forests.

The natural pine forests of Glenmoriston on the north facing slopes are classified as Caledonian in origin but there are few remnants surviving within the plan area; the last 500 acres having been felled just prior to the acquisition of the area by the F.C. The hardwood areas on the south facing slopes tended to be open grown and were not of very good quality.

The first plantations of conifers were formed about 1870 and these were acquired by the F.C. They were comprised of Larch of good quality 60-70 ft. in height and a 7 acre block of N.S. on Port Clair with a standing volume of 4,800 H.ft. per acre.

With the start of planting by the F.C. in 1920 at Port Clair and 1926 at Creag-nan-eun the existing crops of hardwood were gradually replaced by pure conifer crops.

Appendix to (b)

Following is a copy of -

A statement of the difference Sales of the Woods of Glenmoriston since the year 1754 by the late Patrick Grant of Glenmoriston and Colonel Grant his son as follows:-

	£	s.	d
1754 Pillisadge for the Garrison of Ft. Augustus	100	-	-
1758 Birch Wood sold to the Carron Company	1,000	-	-
1760 Fir Woods of Slioch sold at	350	-	-
1760 Pillisadges for Fort Augustus	100	-	-
1767 Oakwood of Invermoriston	60	-	-
1768 Birch of Stron at	120	-	-
Sold of Fir at Sundry times	500	-	-
1782 Fir wood of Ariamaliach	50	-	-
Fir of the Black Burn	25	-	-
Fir of Aultneon	20	-	-
1791 Birchwood of Stron	60	-	-
In '84 and for 5 yrs. after the Birch)			
Wood returned a year	500	-	-
Sold of Fir Trees to Alex. Grant			
Port Clair at different periods	100	-	-
Birch Wood sold to Mr. Fraser	300	-	-
Fir Wood sold to D ^r 20,000 trees	2,666	-	-
Oak wood sold to David Levin	200	-	-
Fir wood sold to Mr. Thomas Clark	50	-	-
Pillisadges	70	-	-
Fir Wood to Duncan MacDonell	25	-	-
Fir Woods to Donald Williamson and)			
Alexander MacTavish	25	-	-
	<u>£6,321</u>	-	-

By proper keeping and management the woods of Glenmoriston will sell in the year 1825 as follows as there will be a greater stool of all sort of woods and especially of Oaks.

The Oak will sell at	1,000	-	-
A cutting of the Brich wood at	600	-	-
A cutting of the Firs	2,500	-	-
A cutting of the Ashwood	200	-	-
	<u>£4,300</u>	-	-

Chapter 4 - Estate Management

(d) Considerations affecting Land Management

1. Boundaries and Fencing Liability

(a) Type of Boundary

Port Clair Forest

Both Feus are contiguous and the boundaries of the combined areas are:-

South west - The Allt na Criche which divides Port Clair from Inohnacardoch Forest and the Allt a' Gradaiche which divides it from Inverwick Forest, the property of Glenmoriston Estate. This boundary is deer fenced.

South east - The Fort Augustus to Invermoriston public road which is unfenced.

North east - The Dalcataig Holding and the Dalcataig Road which are deer fenced.

North west - The River Moriston which is deer fenced.

Creagnaneun Forest

The three Feus are contiguous and the boundaries of the combined areas are somewhat irregular. The extreme west is bounded by the Allt na Criche in Glenmoriston (not to be confused with the Allt na Criche on Port Clair) and is deer fenced. In the extreme north east the boundary is the Grottaig Burn which is deer fenced. The north and north west boundaries between the above mentioned burns are marked by a deer fence and a stock fence which follow with slight deviations the feued boundary. The south boundary in Glenmoriston follows the County Road from Allt na Criche to Invermoriston Post Office then turns away behind the Church to the Allt Coinneag from whence it follows the burn. This boundary is deer fenced. The south east boundary is for the most part the Invermoriston to Inverness public road and is unfenced.

(b) Fencing Liabilities

Port Clair Feu from Glenmoriston

There are no fencing conditions specified in this Feu.

Port Clair - Dalcataig Feu from Glenmoriston

A deer fence was to be erected along the line marked AB and BC (on the Deed Map) at the sole expense of the Forestry Commission and thereafter the fence will be mutual and either party has the right at his own expense to hang and maintain rabbit netting. If extraction operations break the fence, the gaps are to be closed and made deer proof at night.

Creagnaneun Feu from Glenmoriston

A deer fence must be maintained at all times around the subjects disposed unless the Forestry Commission acquire adjoining ground. Where two boundaries join the fence can be allowed to deteriorate providing the new ground is adequately fenced. If in future any part is sold by Forestry Commission, fences must be erected to ensure that no deer come onto afforested ground. There is no mutuality.

Creagnaneun - Achnacraner Feu from Glenmoriston

(1)/

(i) The Feuar at his own expense had to carry out the first repair on all existing fences.

(ii) New fences had to be erected along the mutual march where no fence already existed and the fences between AX and BY (on the plan) had to be deer proof. In addition a deer fence with two gates had to be erected along AB not on feued ground, the fenced march between these points being stock fenced.

Greagnaneun - Ruskitch Feu from Seafield

The Forestry Commission is bound to maintain a march fence, sheep, cattle and deer proof at all times. There is no mutuality.

2. Restrictive Covenants, Reservations etc.

(a) Port Clair Feu from Glenmoriston

(i) The Superiors reserve the fishing on the River Moriston with a right of access for this purpose at any time.

(ii) The Superiors reserve all mines, metals, minerals and fossils in and under the lands feued and power to work, win and carry away the same. Any damage incurred will be compensated.

(iii) In the event of the River Moriston being harnessed for power the Forestry Commission will be bound to grant the Superiors a wayleave for conduits, lines or pipes, wire or other appliances for conveying the water or power to points required and site for turbines. Compensation will be paid for any damage.

(iv) The Forestry Commission are not allowed to erect any building or licensed premises for the sale of spirits, wines, or liquors or to feu, let or use any of the land for the erection of any hotel, public house or premises of this nature.

(b) Port Clair - Dalcataig Feu from Glenmoriston

(i) The land must be used only for Forestry or Agriculture and ancillary purposes.

(ii) As (a) (iv) above.

(iii) The Forestry Commission drainage schemes are to be designed to do as little harm as possible to the neighbouring land.

(iv) The Superiors reserve the use of the Spring at D (shown on the Deed Map) with the right to draw water from it as at present by way of the pipeline indicated. They reserve the right of entry for the purpose of renewing or maintaining the pipeline but the Feuar takes no responsibility for the quantity or quality of the water.

(v) If the Forestry Commission contravene or fail to implement any of the conditions, provisions and obligations this right and all that may follow shall in the option of the Superiors become void and the Feuar shall lose or forfeit all right and interest in the ground.

(c) Greagnaneun Feu from Glenmoriston

(i)/

(i) The Superiors reserve the whole coal, shale, lime, stone, marl, ironstone, clay, freestone, slate, marble and other stone and all other mines, metals, minerals and fossils though not specially enumerated within or under the piece of ground disposed with full power and liberty to search for, work, win, raise calcine and carry away but without prejudice to the right of the dispositivees and their foresaids to utilise all said clay, gravel, stone or marl as they require in connection with their forestry operations.

(ii) The Forestry Commission are bound to leave unplanted the footpaths to the Rocking Stone, to Fasagh Cottage and to the Pony Field at Balinuilt.

(iii) The Forestry Commission must not erect huts or similar buildings temporary or otherwise within view of Invermoriston House or if the huts are erected along the County Road they shall not be erected within one mile of Invermoriston House.

(iv) The Forestry Commission must leave the water lade and sluices, springs and burns supplying water to the Home Farm in their existing state.

(v) The Forestry Commission must not erect any building for the sale nor keep for sale any spirits, wines, excisable or intoxicating liquors. No hotel or public house is to be erected. Allt Sigh Cottage must not be used for sale or consumption of intoxicating liquors etc.

(vi) As (b)(v) above.

(d) Greaganeun - Achnaconeran Feu from Glenmoriston

(i) As (b)(i) above.

(ii) As (c)(v) above.

(iii) As (b)(iii) above.

(iv) To protect his plantations when formed against fire the Feuar will at his own expense maintain so long as he considers necessary a fire trace 30 yards wide immediately inside the northern boundary of the Feu.

(e) Greaganeun - Ruskitch Feu from Seafield

(i) The Superiors reserve for all time full and free access by the road leading from Ruskitch to Grotalg and the old drove road leading from Ruskitch towards Bunloit but that they and their tenants shall be bound in the event of use being made of the said accesses to keep all gates on the said roads properly closed but shall be under no responsibility for any damage which may be done in the failure of any of the tenants to do so.

(ii) The Superiors reserve all springs and streams in and approaching the feued ground and they are not to be diverted by the Forestry Commission without consent from the Superiors in writing, but the Forestry Commission can take or draw water for domestic, forestry or agricultural purposes to the extent of not exceeding one third of the daily supply.

The Superiors reserve the right to divert water through the feued ground for mills or machinery or for watering of land or other purposes but not to prejudice the Forestry Commission's right to one third of the daily supply. Any damage/

damage incurred by such diversions will be compensated and any materials apart from the mines and minerals reserved will be paid for.

(iii) The Superiors reserve all mines and minerals of whatever kind or description within or under the feued lands including stone, clay, sand and gravel with full power to search for, work, win and carry away and to construct all road drains or other works necessary for all or any of these purposes upon payment of compensation for disturbance and for all surface or other damage.

(iv) The Forestry Commission are bound not to harbour foxes or other vermin destructive to game and likely to cause injury to sporting interests on adjacent land. If not the Superiors reserve the right to enter the lands and destroy vermin at their own expense.

3. Easements, Servitudes and Licences

(a) Port Clair Feu

(i) The Forestry Commission has a right of access across the strip of ground between the public road and Loch Ness for the purposes of shipping timber and any cargo required by them at points to be mutually agreed upon as and when required with power to construct a pier or piers with approach roads thereto and other works necessary for loading and discharging cargo.

(ii) The Forestry Commission has the right of access to and from the road leading from Dalcataig Farm and Invermoriston Pier (as shown on the plan). Compensation will be made for any damage done to fences etc. in making use of this right.

(iii) The Forestry Commission granted a Water Wayleave to Edward Ballard, Port Clair, Invermoriston in 1947.

(iv) The Forestry Commission granted a Water Wayleave to Mrs. MacNeill and her heirs and successors, Rudha Ban, Invermoriston in 1948.

(b) Craggananeun Feu

(i) The Superiors have an irredeemable servitude right and tolerance over the lade, sluices, springs and burns of abstracting, using and conveying water from and by the said lade, sluices, springs and burns to the Home Farm and Invermoriston House declaring that the Superiors shall be entitled to abstract, use and convey water for any future additional requirements of the Home Farm, Invermoriston House or any new building erected on Glenmoriston Estate provided that such future supplies shall not deprive the disposeses of domestic water required for buildings they are to erect. The disposeses have the right to draw surplus water for forestry operations provided it does not interfere with the Superiors' supplies.

(ii) The Forestry Commission has the right of access over three tracks shown on the Deed Map providing any damage to tracks or adjoining fences etc. is made good.

(iii) Separate from the original Feu a servitude right of way was granted to the Forestry Commission over the Pony Park at Balinuilt subject to the following conditions:-

a. The Forestry Commission at their own expense can construct a road not exceeding 20 feet in width with such bridges and culverts as may be required over the said/

said route.

b. The Forestry Commission shall be responsible for the maintenance of the said road, bridges and culverts but only to such standards considered necessary for forestry purposes.

c. The Forestry Commission shall make good or pay for any damage caused by the construction of the said road and others to the adjoining land.

d. The Forestry Commission on completion of the construction of the said road and others permit the Superior and his tenants at Achnaconeran to use for pedestrian and livestock traffic only the road constructed from the County Road to the Pony Park.

e. The Forestry Commission are to bear the legal expenses.

(iv) The Forestry Commission granted a Water Wayleave to Mr. James M. B. Kydd at Fasagh in 1958.

(c) Creagnaneun - Achnaconeran Feu

(i) The Forestry Commission has a servitude right to enter on the remainder of the Estate for the purposes of inspection, maintenance or improvement of the access roads, water supplies and drainage systems.

(d) Creagnaneun - Ruskitch Feu

(i) The Superiors reserve the Wayleave for existing field drains or ditches passing from the land belonging to them through the feued ground.

(ii) The Forestry Commission has the right to build piers or jetties and make access roads over Seafield ground between the County Road and Loch Ness but there is no right to the fishing, to water or the foreshore on application.

(iii) The Forestry Commission has the right to quarry and take out of the lands stone, clay, sand and gravel for building and any other purpose connected with forestry and agriculture or other operations providing they do not interfere with springs, streams of water, water courses or field drains and ditches.

(e) General

(i) The Forestry Commission has granted two Wayleaves to the North of Scotland Hydro-Electric Board:-

(a) for the 33 KV pole line and associated stays running from the march fence above Ruskitch to a point near Inchnacardoch Hotel on Inchnacardoch Forest.

(b) for the 33 KV pole line and associated stays running from Pier at Invermoriston through Dalcataig.

(ii) The Forestry Commission has granted a Wayleave for a T.V. Aerial to Mr. A. J. Grant, Insh Ewan, Invermoriston subsisting for twenty years from March, 1961.

(iii) The Forestry Commission has granted Wayleaves to the G.P.O.

4. Public Rights of Way

(a)/

(a) Port Clair

There are no Public Rights of Way detailed in the Feu Charters.

(b) Creagnaneun(i) Achnaconeran

There is a Public Right of Way shown between the red lines on the Deed Map running from the Hotel at Invermoriston to the Crofts at Achnaconeran.

There are two other Rights of Way reserved by the Superiors, one to the Achnaconeran Crofts from near the School and one running parallel with the Allt Coinneag. The parties using these routes are responsible for their maintenance and if used for livestock the livestock must be driven. These rights of way are shown on the Deed Map by blue dotted lines.

(ii) Ruskitch

The Feu Charter states that there is no guarantee that rights of way through the land do not exist. In fact it is generally considered that the old drove road from Ruskitch Inn to Bunloit is a Public Right of Way.

5. Sporting Interests(a) Port Clair

The shootings on Port Clair Forest have been let only sporadically. Recently in 1960 they were leased to Glen Moriston Estates and again in 1963. The leases have covered the season for stag and hind shooting only.

(b) Creagnaneun

In 1924 the shootings were leased to Glenmoriston Estates for a period of twenty years at a fee of £5 per annum with the option to renew the lease for a further twenty years. In 1944 a renewal of the lease was made again for a fee of £5 per annum for twenty years up to 1964 but the conditions exclude an automatic option beyond this date.

The shootings on the Achnaconeran Feu have been leased back to Glenmoriston Estates for twenty-five years from June 30th, 1959 for the nominal rent of 1d. per year.

6. Obligations of Outside Parties to the Forestry Commission

No outside parties at present have any obligation to the Forestry Commission.

Chapter 5 - Amenity

(a) Description of Amenities

The Working Plan area is situated in one of the most scenic parts of the Great Glen and the forests themselves are becoming one of the principal attractions of the locality.

In the early years attention to amenity was provided by the planting of some of the less common conifers along the public roadside and the groups of Tsuga heterophylla, Cypress and Abies species and Laburnum provide a pleasing contrast against the more commercial crops of Douglas fir and Sitka spruce.

(b) Policy and Existing Obligations

The only legal commitment of an amenity nature is the restriction by Glenmoriston Estate on buildings as detailed in Chapter 4 (d)2(c) (iii).

The County Planning Committee have refused to allow any building of houses on Loch Ness side below the County Road, but this does not directly affect the Forestry Commission.

The Scottish Home Department have stipulated the distance that plantations must be from public roads. So far this has only affected the recent plantings at Achnaconeran in Glenmoriston.

There are no local amenity bodies and the national ones have so far remained clear of the area. The local District Council while having an interest has not expressed any view publicly.

(c) Measures Adopted

The only special measures taken to improve the appearance of the Forests have been some high pruning and some planting of Laburnum and Maples alongside the main County Road. The diversity of species and the general thriving nature of the plantations as seen from the public roads on both sides of Loch Ness are contributing to the attractions of an already beautiful countryside and the roads through the forest are rapidly becoming a tourist attraction.

Summary Statement of Growing Stock

as at 30.9.1963.

Working Plan Area Creagnaneun and Port ClairComplete as
necessary

Section

Working Circle

Felling Series

Type (1)	Area (acres) (2)	Volume (h. ft.) (3)	Current Annual Increment (h. ft.) (4)
High Forest			
Coniferous	3,922	5,888.3	421.3
Mixed			
Broadleaved			
Total High Forest	3,922	5,888.3	421.3
Coppice with Standards			
Coppice			
Partially Felled			
Reserved Timber			
Scrub	155		
Felled	<u>Failed</u> <u>Blown</u>		
Other Plantable	70		
Other Land	6		
	3,531		
TOTAL	7,684	5,888.3	421.3

Signature A. RayDate of Compilation July, 1964

Area Statement of Growing Stock as at 30.9.1963

Complete
At
necessary

Section
Working Circle
Felling Series

Deletes
at
necessity

{ High Forest—Main Storey
High Forest—Subsidiary Storey—
Caprice—

Areas in acres

[illegible]

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

Signature

A. Ray

Date of Compilation

July 1961

Working Plan Area Greengrass and Port CladrArea Statement of Growing Stock as at 30.9.19 65

Complete at necessary { Section Working Circle Felling Series

Date at necessary { High Forest—Main Storey

Area in acres

Species (1)	Over- or Under- storey (2)	Even-aged																Uneven-aged			Total (21)
		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)	Pre 1900 (18)	Post 1900 (19)	† Pre and Post 1900 (20)		
N.S.						218		92	336	383	143	45								1,217	
N.S.*									6		16									22	
Total N.S.						218		92	342	383	159	45								1,239	
S.S.			74	19		155	21	10	48	192	62	10								591	
S.S.*						10			3	4	14									31	
Total S.S.			74	19		165	21	10	51	196	76	10								622	
O.S.									3											3	
Ab. Gr.				1				5	30	3										39	
Ab. Nob.								3	5											8	
Ts. Het.								6	37											43	
Thuya									2											2	
Mixed Cons.				1		2														3	
I.C.									6											6	

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

Signature

A. Ray

Date of Completion

July, 1964

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

Signature A. RAY

Date of Completion July, 1964

Area Statement of Growing Stock as at 30.9.1963

Working Plan Area Greengrass and Port Clair

Complete at necessary { Section Working Circle }
Felling Series

Deliver at necessary { High Forest—Main Storey }
~~High Forest—Substorey—Storey~~
~~Coppice~~

Areas in acres

Species (1)	Over- or Under- storey (2)	Even-aged																	Uneven-aged			Total (21)
		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)	Pre 1900 (18)	Post 1900 (19)	† Pre and Post 1900 (20)			
S.P.*			25.5	7		4.3		4	127	288	16										510.5	
S.P.*									11												11	
Total S.P.			25.5	7		4.3		4	138	288	16										521.5	
P.C.									2	1											3	
M.P.										1											1	
E.L.									37	2	12										51	
E.L.*										1											1	
Total E.L.									37	3	12										52	
J.L.			5.5	3		6		3	8		10										35.5	
H.L.			2.5						1	2											5.5	
D.F.			43.5	3		1			238	623	219										1,127.5	
D.F.*									5	2	15										22	
Total D.F.			43.5	3		1			243	625	234										1,149.5	

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

SignatureA. Day

Date of CompletionJuly, 1964

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

Signature

A. RAY

Date of Completion

July, 1964

Area Analysis by Quality Class as at 30.9.1963.

Working Plan Area **Creaghaneun and Port Clair**

* Working Circle

*Section

* Felling Series

*Complete as necessary

PURE AND ALMOST PURE

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class						Not Classi- fiable (9)	Total Area (10)	Remarks (11)
		I (3)	II (4)	III (5)	IV (6)	V (7)	below V (8)			
D.F.	56-65							46.5	46.5	
Total D.F.		7	260	592	180	44	20	46.5	1149.5	
N.S.	01-20	1	13	31					45	
	21-25			8	91		60		159	
	26-30		13	86	104		182		385	
	31-35	1	11	53	172		108		345	
	36-40				19		73		92	
	46-50						218		218	
Total N.S.		2	37	178	386		641		1244	
S.S.	01-20					10			10	
	21-25			11	2	19	44		76	
	26-30	4	8	33	29	26	99.5		199.5	
	31-35			6	5	11	29		51	
	36-40					1	9		10	
	41-45				19		2		21	
	46-50					15	150		165	
	56-65							93	93	
Total S.S.		4	8	50	55	82	333.5	93	625.5	
O.S.	31-35							3	3	
Ab. Gr.	26-30			1	2				3	
	31-35		10	10	9		1		30	
	36-40		3	2					5	
	P.60							1	1	
Total Ab. Gr.			13	13	11		1	1	39	
Ab. Nob.	31-35	1		2			2		5	
	36-40			3					3	
Total Ab. Nob.		1		5			2		8	
Thuva	31-35							2	2	
L.C.	31-35							6	6	

Signature **A. Ray**Date of Compilation **July, 1964**

Area Analysis by Quality Class as at 30.9.1963.

Working Plan Area Greaganeun and Port Clair * Working Circle

* Section * Felling Series

* Complete as necessary

PURE AND ALMOST PURE

Areas in acres

Species (1)	P.Yr. Class (2)	Quality Class						Not Classi- fiable (9)	Total Area (10)	Remarks (11)
		I (3)	II (4)	III (5)	IV (6)	V (7)	below V (8)			
S.P.	21-25				3		13		16	
	26-30		61	162	60		6.5		289.5	
	31-35		18	69	21		33		141	
	36-40		2				2		4	
	46-50				12		31		43	
	56-65							32.5	32.5	
Total SP			81	231	96		85.5	32.5	526	
P.C.	26-30							1	1	
	31-35							2	2	
Total PC								3	3	
M.P.	26-30							1	1	
E.L.	21-25		12						12	
	26-30		1	1	1				3	
	31-35		9	21	7				37	
Total E.L.			22	22	8				52	
J.L.	21-25			10					10	
	31-35		5		3				8	
	41-45		2		1				3	
	46-50						6		6	
	56-65							8.5	8.5	
Total J.L.			7	10	4		6	8.5	35.5	
H.L.	26-30							2	2	
	31-35							1	1	
	56-65							2.5	2.5	
Total H.L.								5.5	5.5	
D.F.	21-25		23	86	73	39	13		234	
	26-30		189	360	69	2	5		625	
	31-35	7	48	146	38	3	1		243	
	46-50						1		1	

Signature A. BayDate of Compilation July, 1964

Volume Statement of Growing Stock as at 30.9.1963.

Working Plan Area Creagnaneun and Port ClairComplete as necessary { Section
Working Circle
Felling Series

Volumes in hoppus feet

Species or Species Groups (1)	Age Year Class (2)	Volumes by Size Classes (B.H.Q.G.)						Total Volume (9)	Pre-cision (10)	Current Annual Increment (11)
		2 1/2-6" (3)	6 1/2-9" (4)	9 1/2-12" (5)	12 1/2-15" (6)	15 1/2-18" (7)	18" + (8)			
S.P.	21-25	3.0						3.0		
	26-30	313.7	78.3	7.0				399.0		
	31-35	94.8	2.6					97.4		
	36-40	2.4						2.4		
Total S.P.		413.9	80.9	7.0				501.8		41.8
P.C.	31-35	2.0						2.0		0.2
E.L.	21-25	3.0	16.0	6.0				25.0		
	26-30	3.0	1.0					4.0		
	31-35	49.7	3.3					53.0		
Total E.L.		55.7	20.3	6.0				82.0		4.3
J.L.	21-25	5.0	16.0	4.0				25.0		
	31-35	7.8	5.4					13.2		
	41-45	4.0						4.0		
Total J.L.		16.8	21.4	4.0				42.2		2.4
H.L.	26-30	2.0	1.0					3.0		
	31-35	2.0						2.0		
Total H.L.		4.0	1.0					5.0		
D.F.	21-25	78.0	342.0	243.0	50.0			713.0		
	26-30	162.2	987.6	844.8	96.4	10.9		2101.9		
	31-35	202.6	401.0	82.6	6.7			692.9		
Total D.F.		442.8	1730.6	1170.4	153.1	10.9		3507.8		223
N.S.	01-20	50.0	78.0					128.0		
	21-25	120.0	62.0	11.0				193.0		
	26-30	247.5	101.6	2.4				351.5		
	31-35	255.6	33.8					289.4		
	36-40	5.0						5.0		
Total N.S.		678.1	275.4	13.4				966.9		77.8

Signature A. RayDate of Compilation July, 1964

Chapter 6 - Growing Stock

(a)-(d) - W.Ps. 4, 5, 6 and 9.

(e) Enumeration Methods

The assessment of the measurable growing stock was carried out by the Management Section of the Research Branch under the Working Plans Officer for Scotland.

Basic Survey

The basic survey for Creagnaneun was started on 17th April, 1961 and was completed by the 3rd of May, 1961. That for Port Clair was started in February, 1961 but as certain road lines on which recompartmenting was to be based, were not cut until later that year the survey was not finally completed until February, 1962.

Method of Survey

Chain and compass were used for the whole survey, an abney level being used to estimate angle of slope so as to allow for the reduction in measured lengths. No undue magnetic attraction was encountered.

On Creagnaneun approximately 7 acres have been fenced and planted outside the acquisition boundary. The area measured within the acquisition boundary exceeded the acquisition total of 2,139 by only 5 acres so the acquisition total was accepted and an adjustment made to the acreage in the other plantable/other land category on the WP 4.

On Port Clair all fencing and planting falls within the acquisition boundary, and the total area computed as being within this boundary exceeded the acquisition total of 5,545 acres by only 46 acres, a discrepancy of less than 1 per cent. The acquisition total was therefore accepted and the 46 acres were deducted from the other plantable/other land category on WP 4.

On Creagnaneun roads were few and consequently only minor alterations were made to the original compartment lay-out which was based mainly on rides but occasionally on the larger streams. This has resulted in some compartments being larger than usual with some exceeding 50 acres.

The boundary between compartments 54 and 55 was surveyed as a pegged road line.

Port Clair was recompartmented using roads, proposed road lines and streams as compartment boundaries wherever possible.

Crop Assessment

The crop assessment on Creagnaneun was started on May 5th, 1961 and completed by 5th June, 1961. As the area of crops under ten years of age was small the whole area was assessed and the reference date taken as 30th September, 1960. Visual estimates of volume based on alignment charts were made in all sub-compartments with measurable volume.

On Port Clair the crop assessment was started on 15th December, 1961 and completed by 15th February, 1962. The datum line was taken as the 30th September, 1961. The identification of sub-compartments was made easier by the good aerial coverage available. A schedule of plantations at present in check was prepared and submitted for both Port Clair and Creagnaneun.

Standing volumes were obtained from top height/basal area charts, top height being measured by Blume Leiss or Haga hypsometer and basal area measurement by relascope sweeps. The whole forest area was assessed as the area under ten years of age was very small.

Volume Enumeration/

Volume Enumeration

Volume enumeration on Creagnaneun was carried out between 26th June and 11th July and the reference date also taken as 30th September, 1960. In all there were 1,331 acres classed as ten years of age and over, excluding checked areas and one 1/10th acre plot was measured for every 15 acres in this category, giving 89 plots in all. The visual estimates of volume were accepted without amendment as the difference between the visual estimate and plot totals was only about 1 per cent. The increment was calculated in accordance with W. P. T. I. No. 4 dated 1959 but no reductions were made for Yield Table overestimation, understocking, roads etc.

On Port Clair the volume enumeration was carried out between 19th February, 1962 and 9th March, 1962. The datum line again being 30th September, 1961. In all 2,175 acres were sampled i.e. the 2,387 acres of High Forest less the 209 acres of checked plantations and 3 acres aged ten years or under. One 1/10th acre plot was measured for every 25 acres of sampled area, giving 88 plots in all. The number of plots measured in any one species and age class category is in direct ratio to the area of that category. The total volume derived from the enumeration plots was estimated to be 3,295,000 hoppus feet which exceeded the volume from visual estimates by only 122,500 hoppus feet or $3\frac{1}{2}$ per cent. The visual estimates were therefore accepted without amendment and recorded on WP 4 and WP 9. Volumes on WP 9 were subdivided into size classes on information obtained from the plot data. The volume increment was calculated in accordance with W. P. T. I. No. 4 dated February, 1962 and reduced by $13\frac{1}{2}$ per cent to allow for understocking, gaps, roads, rides and other unproductive areas.

Amendments

Note by Mr. G. M. L. Locke.

In 1962 it was decided that Creagnaneun and Port Clair Forests would be combined into one working plan area and that the two forests should have similar reference dates. The data for Creagnaneun Forest has therefore been amended and the reference date is now 30th September, 1962. The area figures were easily adjusted as only 30 acres had been planted in F.Y. 61 and no areas had been felled. The current annual increments were then reduced by $13\frac{1}{2}$ per cent, the same reduction figures as used in Port Clair Forest, and one year's increment added to the standing volumes as at 30th September, 1960. The volumes were then broken down into size classes on the basis of percentage distributions obtained from the sample plots. No reduction was made in the standing volumes for thinnings made in F.Y. 61 as the volume was small, less than 30,000 hoppus feet, and the thinnings had already been felled by the time of crop assessment.

(f) Description of the Growing Stock

The forests have been developed as even aged coniferous high forests with a predominance of Norway spruce and Douglas fir. The species composition of the growing stock by percentage is:-

Norway spruce	32%	Douglas fir	29%	Sitka spruce	15%
Scots pine	14%	European larch	1%	Japanese larch	1%
<u>Abies grandis</u>	1%	<u>Tsuga</u>	1%	Others	1%
Mixtures	5%				

Norway spruce - 1,244 acres pure, 73 acres mixture

Norway spruce has been planted fairly extensively on both Port Clair (842 acres + 73 acres mixture) and Creagnaneun (402 acres) Forests. Of the 1,317 acres planted only 603.5 acres have developed to the stage where they can be classified into quality classes. The remainder extending to 713.5 acres is made up of 176 acres checked and 537.5 acres below Quality Class V and the P. Year breakdown is:-

	P21-25	P26-30	P31-35	P36-40	P46-50
<u>Port Clair</u>					
Norway spruce Pure Under Q.C. V	58	62	35	70	203
Checked	2	92	21	-	15
Mixture Under Q.C. V	2.5	7	-	-	17
Checked	-	-	46	-	-
<u>Creagnaneun</u>					
Norway spruce Pure Under Q.C. V	-	28	52	3	-
Checked	-	-	-	-	-
	62.5	189	154	73	235

235 acres however is post war planting of the burned area of Port Clair.

Norway spruce was planted on a variety of sites and on both low and high ground on both forests. Its performance has been varied showing good growth on the lower flushed areas but disappointingly slow on the higher ground and calluna sites.

Douglas fir - 1,149.5 acres pure, 2.5 acres mixture

Douglas fir has been extensively planted on both Port Clair (692 acres + 2.5 acres mixture) and Creagnaneun (457.5 acres). Of the 1,152 acres planted all but 46.5 acres have reached quality class standard. Douglas fir was planted for the most part on the better mineral soil areas and has been the most successful species. It is now providing the bulk of the thinning volume on the working plan area.

Its form is variable and to a large extent it depends on the initial stocking. Where there has been full stocking on the better sites its form is good, but on the very bouldery sites where stocking has been sparse the form and branching is rough.

It has been prone to windblow particularly on the Loch Ness section of Port Clair. The blown areas in general are confined to the flatter wetter ground, which would be equally well if not better suited to spruce.

On the Ruskitch section of Creagnaneun Douglas fir was established in Anderson groups. On the whole these groups suggest that it is not a tree for this type of silviculture, the outside trees being very heavily branched.

Sitka spruce - 625.5 acres pure, 42.5 acres mixture

Sitka spruce has not been planted on a very large scale on Port Clair (424 acres + 42.5 acres mixture) and Creagnaneun (201.5 acres pure). Of the total 668.0 acres only 199 acres have developed to the stage when they can be classified into quality classes, of the remainder 93 acres are P.60 to P.63 and non-classifiable, 40 acres are in check, and 366 acres are below Quality Class V. The P. Year breakdown is:-

	P21-25	P26-30	P31-35	P36-40	P41-45	P46-50
<u>Port Clair</u>						
Sitka spruce Pure Under Q.C. V	44	27	13	9	2	134
Checked	-	-	9	-	-	16
Mixture Under Q.C. V	.5	7	18	-	-	17
Checked	-	-	-	-	-	-
<u>Creagnaneun</u>						
Sitka spruce Pure Under Q.C. V	-	57.5	7	-	-	-
Checked	-	15	-	-	-	-
	44.5	106.5	47	9	2	167

Sitka spruce has been planted on a variety of sites and its success has been very variable. Where it has been planted in true flushed conditions and on the wetter creep soils its growth has been very good, e.g. the proposed Seed Stand in Compartment 31 Creagnaneun and the Sample Plot in Compartment 30 Port Clair which was blown in the gales of January, 1957. However where it was planted in peat with a dominant calluna vegetation development has been slow, probably on account of poor ground preparation and lack of maintenance.

This species could have been used to better advantage on the flats and concave slopes of creep soils where Douglas fir was planted and proved to be unstable and of poor form.

Scots pine - 526 acres pure, 55 acres mixture

Scots pine has not been planted on a very large scale, on Port Clair (176 acres + 55 acres mixture) and Creagnaneun (350 acres). Of the total of 581 acres, 423 acres have developed to quality class standard, of the remainder 32.5 acres are P.61 to P.63 and not classifiable, 3 acres are in check and 122.5 acres are below Quality Class V. Of the 122.5 acres below Quality Class V only 2.5 acres are on Creagnaneun, the remainder being in the P.46-P.50 and the Inverwick section of Port Clair.

Scots pine has been planted on two main site types, the shallow peat on mineral soil and the deeper peat characterised by rank calluna and vaccinium. On the shallow peat it has grown well but on calluna/vaccinium sites chiefly on Port Clair it is not at all encouraging, probably on account of the lack of ground preparation and the difficulties of draining this type of ground before ploughing was common practice.

European larch, Japanese larch, and hybrid larch - 91 acres pure, 2 acres mixture

Larches have been planted on a very small scale on Port Clair (54 acres + 2 acres mixture) and Creagnaneun (37 acres). Of the total 93 acres only 18 acres have not yet developed to quality class standard and of these, 9 acres are post P.60 and not classifiable.

Where planted the larches have been reasonably successful but generally speaking of poor form. They have been planted on good mineral soils/

soils which would have given a better return had they been planted with Douglas fir or Sitka spruce.

The majority of larches on Port Clair are scheduled for clear felling but those on Creagnaneun which are closely intermixed with Douglas fir are to be retained.

Abies grandis - 39 acres

Although Abies grandis has only been planted in small quantities on Port Clair (30 acres) and Creagnaneun (9 acres) it has been very successful e.g. the Sample Plot in Compartment 19 Port Clair. It has been planted on good creep soil sites and if it became acceptable as a sawing timber as well as a pulping timber it could be used in greater quantities to advantage.

Other Species - 70 acres

Of the 70 acres of other species 44 acres are Tauca heterophylla and 8 acres Abies procera. These are the only two other species that have shown worthwhile growth. They have been planted on Port Clair in calluna, bracken and vaccinium areas and on Creagnaneun Tauca has been planted on dry bracken sites on creep soils.

Some of the Tauca on Creagnaneun in the Ruskitch area has been planted in Anderson Groups and its performance under this type of silviculture is very promising. It has thrived in the groups and produced trees of very good form and so far free from rot.

(g) Seed Origins

There are only two stands of exceptional quality:

- (i) The Abies grandis Sample Plot in Compartment 19 Port Clair, P.32.
- (ii) The proposed Seed Stand of Sitka spruce in Compartment 30 Creagnaneun, P.28.

Apart from these, there is the Norway spruce Sample Plot in Compartment 38 Port Clair P.20 and although it is Quality Class I its form is not exceptional, and the Douglas fir Sample Plot in Compartment 31 Creagnaneun P.28, which again has not exceptionally good form.

The species which have grown best are Douglas fir, Sitka spruce, Norway spruce and Scots pine.

Douglas fir have grown well on the most fertile and sheltered sites in the working plan area, producing a high average of Quality Class II and III stands. On the moister sites, however, quality is impaired by butt sway and in other places where stocking is low, by rough branching. On the moister sites Sitka spruce would have grown timber of the same quality class, there being Quality Class I, II and III stands on similar sites at both forests.

The average Quality Class of Sitka spruce is low at V and is entirely due to the bad siting of the species in the P.21-P.30 period when out of 275.5 acres planted on poorly drained calluna dominated peats, some 144 acres are still classified as below Quality Class V.

On mineral soil sites Norway spruce has grown well, but, like Sitka spruce, early planting on poorly prepared peats has grown very slowly. On the mineral soil sites Sitka spruce would have been more productive and much more profitable.

Where Scots pine has contact with mineral soil it has grown satisfactorily producing Quality Class II/III rate of growth, but where planted on deep peat it has been less successful. Pinus contorta would be more profitable on the latter type of site.

Chapter 7 - Organisation

(a) Previous Plans

The first plan for Port Clair Forest was prepared to cover the period 1924-1928 and that for Creagnaneun Forest the period 1928-1932. A series of subsequent plans were prepared and the prescriptions carried out in the light of the existing policies. Plans of Operations were prepared for 1950 onwards and revised until the introduction of the Working Plan forms.

The early plans dealt chiefly with establishment with considerable attention being paid to the treatment of Oak and Birch scrub. Later there is more emphasis on maintenance and cleaning until the working of produce began.

The lessons to be learned from each plan have been the need for flexibility and a readiness to amend and adapt plans to fit in with changes of policy.

(b) Administrative Subdivisions

1. Districts - The Working Plan area is within the charge of one District Officer.
2. Forests - There are two Forests embraced by the Plan, namely Port Clair and Creagnaneun.
3. Sections - The two Forests each form one section of the Working Plan area.
4. Beats - Nil.
5. Working Blocks - There are ten Working Blocks, five in each Section and are laid out in accordance with the five year Thinning Cycle as follows:-

<u>Port Clair</u>	<u>Creagnaneun</u>
(1) C.1-C.13	(1) C.22-C.31
(2) C.14-C.32	(2) C.32-C.37
(3) C.33-C.36, C.59, C.64-C.67 and C.70-C.94	(3) C.37-C.46
(4) Cpts. 37, 40, 43, 46-49, 54, 55 and 61	(4) C.15-C.21
(5) Cpts. 38, 39, 44, 50-53, 56, 57, 60, 62, 63, 68 and 69	(5) C.1-C.14

6. Compartments - Compartments vary in size from 10 acres to 83 acres. Where possible they are bounded by roads, perennial burns and fences, but in places where the roads have not been laid out they conform to the old pattern when rides formed the boundaries. The few exceptionally large compartments are due to the inclusion of considerable areas of unplantable ground.

(c) Management Subdivisions

1. Working Circles - The Working Plan area comprises one Working Circle.
2. Felling Series - There are two Felling (Thinning) Series, one in each section.

3. Cutting Sections - These are at present synonymous with the Working Blocks.

4. Sub-compartments - These are based on different species, conspicuous differences in development in any species and a difference in P. Year.

Chapter 8 - Planting Rate and Resumption of Land(a) Planting

The areas planted by Planting Years are given in Table I below.

Table I

	<u>Port Clair Forest</u>	<u>Creagnaneun Forest</u>
P.20	33 acres	Nil acres
P.21	167 "	Nil "
P.22	194 "	Nil "
P.23	158 "	Nil "
P.24	159 "	Nil "
P.25	202 "	Nil "
P.26	180 "	157 "
P.27	157 "	163 "
P.28	157 "	191 "
P.29	150 "	142 "
P.30	147 "	142 "
P.31	188 "	160 "
P.32	161 "	102 "
P.33	120 "	133 "
P.34	121 "	50 "
P.35	72 "	50 "
P.36	64 "	3 "
P.37	30 "	Nil "
P.38	30 "	Nil "
P.39-P.42	Nil "	Nil "
P.43	29 "	Nil "
P.44	3 "	Nil "
P.45	10 "	Nil "
P.46-P.47	Nil "	Nil "
P.48	94 "	Nil "
P.49	158 "	Nil "
P.50	162 "	Nil "
P.51-P.57	Nil "	Nil "
P.58	2 "	Nil "
P.59	11 "	Nil "
P.60	Nil "	31 "
P.61	Nil "	30 "
P.62	41 "	40 "
P.63	Nil "	40 "

The above has been taken from old annual reports and R.I's.

At the Census of 1938 some write offs were made and are detailed in Table II below.

Table II

	<u>Port Clair Forest</u>	<u>Creagnaneun Forest</u>
P.22	60 acres	Nil acres
P.23	28 "	Nil "
P.24	1 acre	Nil "
P.25	19 acres	Nil "
P.27	Nil "	13 "
P.28	12 "	Nil "
P.30	6 "	Nil "
P.32	6 "	Nil "
	—	—
	132 acres	13 acres
	—	—

Since/

Since then some war time fellings, and the 1943 fire in Port Clair and windblows at both forests have occurred and replanting undertaken.

Added to this the planted acreage was adjusted following the resurvey of 1961 (see WP 11) so that the sum of the acreages shown in Table I bears no real relation to the total planted acreage as shown on WP 4.

The main planting period on both forests was pre-war when the original acquisitions were systematically planted up. The other periods of plantings followed the 1943 fire and small acquisitions from Glenmoriston Estates.

(b) Resumption

All land at present classified as plantable is in hand and is detailed on Forms WP 12. Any further planting will depend on either a reclassification of ground at present deemed unplantable or new acquisitions.

The revised procedure for the resumption of land is laid down in the Directorate Instruction dated 25th March, 1958. However, since there is no ground on either forest under the management of the Department of Agriculture and Fisheries for Scotland there has been no need for its implementation.

Chapter 9 - Silviculture

(a) Silvicultural Systems

Both forests have been established by planting.

(b) Thinning

The majority of the thinnings on both forests have been in the Douglas fir plantations and could be termed heavy low thinnings conforming more or less to C/D grade. The preponderance of Douglas fir can be seen by the fact that at Port Clair about 85% and Creagnaneun about 75% of the thinning volume has been Douglas fir during the past five years. The relatively small areas of Sitka spruce have been treated similarly to Douglas fir but the Norway spruce and Scots pine stands have been thinned less heavily.

The average thinning yields per acre for the main species have been:

Douglas fir	-	400-700 H. ft.
Sitka spruce	-	400-700 H. ft.
Norway spruce	-	350-450 H. ft.
Scots pine	-	200-300 H. ft.

Variations depend on the number of the thinning, the density of stocking, and the quality class. Generally the higher yields have been from areas where thinnings have been delayed on account of lack of markets and inaccessibility.

(c) Felling

A small amount of felling was done during the war when P.24 Douglas fir was felled and replanted in P.43. Apart from that the only fellings have been done to clear roadlines.

Chapter 10 - Crop Establishment

(a) Choice of Species

When planting began at Port Clair in 1920 and at Creagnaneun in 1926 a good indication of the Forests' potential was obtained from the performance of the various species in the acquired plantations of Sitka spruce, European larch, Japanese larch and Douglas fir on Inchmacardoch, of European larch and Norway spruce on Port Clair, and European larch on Creagnaneun. Remnants of Caledonian pine on both forests gave an indication of the potentialities of Scots pine.

In general the original planting pattern was that Douglas fir was planted on the lower creep soil slopes with some Sitka spruce in the damper hollows and flushes. European larch and Japanese larch were confined for the most part to the good middle hill ground and Norway spruce with some Scots pine covering the remaining high ground and the drier areas at low level.

Later from P.30 onwards Abies grandis, Abies procera and Tsuga heterophylla were planted on a small scale on a variety of sites.

The outcome to date is fairly typical in that the Douglas fir and Sitka spruce on the lower ground have thrived whereas much of the Norway spruce on the higher ground has checked or grown very slowly. The other species have done quite well especially Abies grandis.

In the more recent plantings (P.60 onwards) the emphasis has still been on Douglas fir and Sitka spruce on the lower slopes but with an increased use of Sitka spruce with Pinus contorta or Scots pine on the higher ground to the exclusion of Norway spruce.

(b) Preparation of Ground

(i) Treatment of Scrub

The treatment of birch and other hardwoods classed as scrub has varied over the years.

The earliest treatment seems to have been complete clearance. Then in 1924 clear felling of birch ceased, the treatment being to sell any marketable birch and thin out or girdle the unmarketable. In 1932 the prescription was to leave any oak untouched, retain any good birch and girdle the remainder.

At this time the oak and birch scrub at Ruskitch was subjected to group clearance and planting undertaken on the Anderson Group system.

In 1934 it was policy to keep girdling to a minimum and this seems to have persisted until the main plantings were completed.

More recently the policy has been to clear-fell all scrub unless of exceptional quality whereas the current practice is to retain young birch of good form where it is likely to reduce weeding costs but to clear areas of older rougher birch which would otherwise create problems in the future.

The follow up treatment in the past has been to girdle out the retained birch and oak as soon as the planted crop was established. Currently, girdling is done only where the trees are out of the public view, the more obvious stems being felled.

(ii) Draining

The natural drainage of the area is good and in the early years draining was kept to a minimum, and consisted of trap draining with leaders through the flushes. In 1927 when turf planting/

planting was introduced draining was consequently more intensive to provide turf on flushed areas and areas where the peat was more than six inches deep. This same policy is continued to the present day in small areas inaccessible to ploughs.

(iii) Ploughing

All ploughing on the area has been done since 1960 and the only plough used has been a hydraulic tine outfit which has ploughed small areas simulating dry heath on Creagnaneun and other small areas where impeded drainage has been caused by an impervious subsoil of compacted stones and silt on both Forests.

(c) Planting Methods

Planting methods have followed the standard pattern of the day. Some pit planting and direct notching was used in the earliest plantings. Then in 1927 turf planting was introduced on the wetter areas with screefing and notch planting on the drier areas, sometimes with mattock sometimes with spade.

The current practice is screefing and 'L' or 'T' notching on the direct planting areas and vertical notching on the tine ploughing with the garden spade and schlich spade.

(d) Weeding

In the early years of planting advance weeding was undertaken two years before planting so that the actual weeding was confined more or less to bracken switching or the cutting of coppice regrowth. Later weeding was confined to the heavy bracken areas, early switching continuing on other areas.

Currently weeding areas are small and mostly facing south and bracken cutting is left until late in the season so that the ground is not exposed to excessive drying out and the grass which inevitably follows the bracken is kept more or less in check until the plants are established.

(e) Beating Up

The records of beating up are fairly scant but in 1932 the Port Clair Plan states that pre P.29 areas were insufficiently drained and all beating up had been ineffective on account of this, thus the beating up which followed took the form of more intensive draining with Scots pine and Sitka spruce being the main species used.

The Creagnaneun Plan in 1936 states that beating up in P.26 will amount to replanting with more intensive turf draining and the application of slag at planting.

Beating up on the whole appears to have been fairly limited and effective.

The more recent plantings have been beaten up immediately where required and the Conservancy Instructions on policy adhered to.

Chapter 11 - Crop Maintenance

(a) Fencing

The original march fences on both Forests were stock and deer proof and the initial plantings were well protected. However, later on, the more exposed stretches of fence began to deteriorate and some breakages occurred particularly in time of snow.

Continued inspection and repair has been required on the west march fence of Port Clair and a gradual deterioration of the march fence at Creagnaneun has led to a considerable amount of maintenance in the last three years.

The position at present is that all the march fences are secure.

(b) Cleaning

In the early years cleaning appears to have been limited to the removal of birch, hazel and oak regrowth. However, more recently a considerable amount of cleaning of suppressed stems was done prior to thinning and there was a good market for much of the produce in pokers for the British Aluminium Company at Fort William and Kinlochleven.

The poker market is no longer available and cleaning is now confined to the removal of coppice regrowth etc.

(c) Drain Maintenance

Drain maintenance on the creep soils does not appear to have been a problem in itself. However, the roading of the Forests and subsequent culverting which tends to concentrate water and speed up the run off has meant that deepening of existing drains and in some cases the digging of new drains has been necessary.

This type of work is up to date on Port Clair but is somewhat in arrears on Creagnaneun.

Drain maintenance on the peat areas has been and still is a problem, and work is somewhat in arrears at both forests.

(d) Racking

Racking for inspection has not been done in recent years since the parts of the Forest which would have required this sort of work are in the second and third thinning stage.

On account of the new thinking on methods of extraction i.e. Isaacshen Winches and Horse Sledges racking will become increasingly necessary.

(e) Brashing

Brashing began in the 1930's and has continued at varying degrees to the present day. At present there are considerable areas being recruited to the brashing stage and during the past two years there has been considerable expenditure on this work.

The practice is to brash at least 80% of the stems in spruces, Douglas fir, and other conifers such as Abies grandis, Abies procera and Tsuga heterophylla, but do little in Scots pine and the larches.

(f) Pruning

Some small plots of Sitka spruce and selected stems in the Sample Plots have been high pruned as have also some trees along the public roadside, but generally speaking pruning has not been a regular practice to date.

Chapter 12 - Crop Improvement

(a) Enrichment

In F.Y. 31 and F.Y. 32 a considerable area of Anderson Groups was planted on Creagnaneun Forest, the main species being Norway spruce, Douglas fir and Tsuga, with a little Japanese larch. In F.Y. 39 and F.Y. 40 the gaps between these groups were planted up with a variety of species including Scots pine, Douglas fir, Norway spruce and Sitka spruce.

This appears to be the only work done on the area that could be classed as enrichment although at the time it was done it was recorded as Beating Up on the R.I's.

(b) Rehabilitation

The main early work which might have been classed as rehabilitation has been dealt with under Beating Up in Chapter 10 (e).

On Port Clair Forest during the past two years small areas of retarded spruce within the main thinning area have been redrained and where required fertilisers in the form of Ground Mineral Phosphate and Triple Super Phosphates have been applied. The real effects of this work have not yet become apparent but there is a notable improvement in the foliage colour.

(c) Other Methods

Nil.

Working Plan Area Creagnewn/Port Clair

Volumes in ~~000~~ h. ft. over bark
Areas in acres

* Complete as
necessary

* Section

Creagnewn

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	4,899	0.5	284	-	1,827	-	-	-	2,788	0.5	-	-	-	-	-	-	
	2 1/2"-6"	1,589		263		1,005				321								
	6 1/2"-9"	2,038		21		627				1,390								
	Over 9"	1,272		-		195				1,077								
62	Total	23,750	61.0	4,544	19.5	8,819	17.5	-	-	10,387	24.0	-	-	-	-	-	-	
	2 1/2"-6"	12,185		4,196		5,830				2,159								
	6 1/2"-9"	9,293		348		2,755				6,190								
	Over 9"	2,272		-		234				2,038								
63	Total	22,950	51.5	4,797	19.0	5,753	10.0	-	-	12,400	22.5	-	-	-	-	-	-	
	2 1/2"-6"	11,716		4,505		3,178				4,033								
	6 1/2"-9"	8,638		292		2,343				6,003								
	Over 9"	2,596		-		232				2,364								
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

Working Plan Area **Greagnum/Port Clair**Volumes in 000s h. ft. over bark
Areas in acres

* Complete as necessary

* Section **Greagnum**

* Working Circle

* Felling Series

Year (1)	B.H., A.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	6,909	-	2,554	-	1,571	-	-	-	2,784	-	-	-	-	-	-	-	
	2 1/2"-6"	4,032		2,324		993				715								
	6 1/2"-9"	2,184		230		443				1,511								
	Over 9"	693		-		135				558								
62	Total	10,640	-	564	-	1,809	-	720	-	4,489	-	3,058	-	-	-	-	-	
	2 1/2"-6"	6,169		392		1,799		534		1,681		1,763						
	6 1/2"-9"	3,878		172		10		173		2,288		1,235						
	Over 9"	593		-		-		13		520		60						
63	Total	35,044	-	4,429	-	11,678	-	770	-	18,167		-	-	-	-	-	-	
	2 1/2"-6"	15,152		2,988		5,353		464		6,247								
	6 1/2"-9"	14,745		1,379		4,902		306		8,158								
	Over 9"	5,147		62		1,423		-		3,662								
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

Working Plan Area Greengrannum/Port Clair

Volumes in ~~000~~ h. ft. over bark
Areas in acres

* Complete as
necessary* Section Greengrannum

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	11,808	0.5	2,838	-	3,398	-	-	-	5,572	0.5	-	-	-	-	-	-	
	2 1/2"-6"	5,621		2,587		1,998				1,036								
	6 1/2"-9"	4,222		251		1,070				2,901								
	Over 9"	1,965		-		330				1,635								
	Total	34,390	61.0	5,108	19.5	10,628	17.5	720	-	14,876	24.0	3,058	-	-	-	-	-	
62	2 1/2"-6"	18,354		4,588		7,629		534		3,840		1,765						
	6 1/2"-9"	13,171		520		2,765		173		8,478		1,235						
	Over 9"	2,865		-		234		13		2,558		60						
	Total	57,994	51.5	9,226	19.0	17,432	10.0	770	-	30,567	22.5	-	-	-	-	-	-	
	2 1/2"-6"	26,868		7,493		8,531		464		10,380								
63	6 1/2"-9"	23,383		1,671		7,245		306		14,161								
	Over 9"	7,743		62		1,655		-		6,026								
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

Working Plan Area Craguenure/Port Clair

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

* Complete as necessary
* Section Craguenure
* Working Circle
* Felling Series

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Other
		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)	
56	Total	76,398	98.25	-	-	11,641	13.5	1,620	3.0	63,157	81.75	-	-	-	-	-	-	
	2 1/2"-6"	48,411				6,550		1,500		40,361								
	6 1/2"-9"	27,987				5,091		120		22,776								
	Over 9"	-				-		-		-								
57	Total	24,117	27.0	4,097	12.0	14,669	14.5	-	-	5,351	0.5	-	-	-	-	-	-	
	2 1/2"-6"	16,257		4,072		10,362		-		1,823								
	6 1/2"-9"	7,860		25		4,307		-		3,528								
	Over 9"	-		-		-		-		-								
58	Total	8,954	12.5	-	-	668	-	-	-	4,483	8.0	3,803	4.5	-	-	-	-	
	2 1/2"-6"	5,720				408		-		2,644		2,668						
	6 1/2"-9"	2,772				260		-		1,469		1,043						
	Over 9"	462				-		-		370		92						
59	Total	24,282	43.75	-	-	1,170	10.0	3,804	12.0	18,178	20.5	1,130	1.25	-	-	-	-	
	2 1/2"-6"	10,848		-		1,170		2,700		6,316		662						
	6 1/2"-9"	11,978				-		1,104		10,406		468						
	Over 9"	1,456				-		-		1,456		-						
60	Total	44,651	83.75	596	2.25	4,460	16.50	-	-	39,595	65.0	-	-	-	-	-	-	
	2 1/2"-6"	13,441		527		3,875		-		9,039								
	6 1/2"-9"	24,128		69		555		-		23,504								
	Over 9"	7,082		-		30		-		7,052								

Working Plan Area **Creeganneum/Port Clair**

Volumes in 1000's h. ft. over bark
Areas in acres

* Complete as
necessary

* Section

Creeganneum

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.A.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Oc
		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)	
56	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
57	Total	6,106	5.5	630	1.0	-	-	-	-	5,476	4.5	-	-	-	-	-	-	-
	2 1/2"-6"	4,266		630						3,636								
	6 1/2"-9"	1,840		-						1,840								
	Over 9"	-		-						-								
58	Total	7,727	-	-	-	138	-	-	-	7,589	-	-	-	-	-	-	-	-
	2 1/2"-6"	3,024				58				2,966								
	6 1/2"-9"	3,428				80				3,348								
	Over 9"	1,275				-				1,275								
59	Total	1,313	-	-	-	-	-	374	-	939	-	-	-	-	-	-	-	-
	2 1/2"-6"	228						-		228								
	6 1/2"-9"	548						-		548								
	Over 9"	537						374		163								
60	Total	9,197	-	1,393	-	7,204	-	-	-	-	-	-	-	-	-	-	-	-
	2 1/2"-6"	5,389		1,305		4,084												
	6 1/2"-9"	3,808		88		3,120												
	Over 9"	-		-		-												

Working Plan Area Greenganeun/Port ClairVolumes in 000's h. ft. over bark
Areas in acres* Complete as
necessary* Section Greenganeun

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Oc
		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)	
56	Total	76,398	98.25	-	-	11,641	13.5	1,620	3.0	63,137	81.75	-	-	-	-	-	-	-
	2 1/2"-6"	48,411		-		6,550		1,500		40,361		-						
	6 1/2"-9"	27,987		-		5,091		120		22,776		-						
	Over 9"	-		-		-		-		-		-						
57	Total	30,223	32.5	4,727	13.0	14,669	14.5	-	-	10,827	5.0	-	-	-	-	-	-	-
	2 1/2"-6"	20,523		4,702		10,362		-		5,459		-						
	6 1/2"-9"	9,700		25		4,307		-		5,368		-						
	Over 9"	-		-		-		-		-		-						
58	Total	16,681	12.5	-	-	806	-	-	-	12,072	8.0	3,803	4.5	-	-	-	-	-
	2 1/2"-6"	8,744		-		466		-		5,610		2,668						
	6 1/2"-9"	6,200		-		340		-		4,817		1,043						
	Over 9"	1,737		-		-		-		1,645		92						
59	Total	25,595	43.75	-	-	1,170	10.0	4,178	12.0	19,117	20.5	1,130	1.25	-	-	-	-	-
	2 1/2"-6"	11,076		-		1,170		2,700		6,544		662						
	6 1/2"-9"	12,526		-		-		1,104		10,954		468						
	Over 9"	1,993		-		-		374		1,619		-						
60	Total	53,848	83.75	1,989	2.25	11,664	16.5	-	-	39,595	65.0	-	-	-	-	-	-	-
	2 1/2"-6"	18,830		1,832		7,959		-		9,039		-						
	6 1/2"-9"	27,936		157		3,675		-		23,504		-						
	Over 9"	7,082		-		30		-		7,052		-						

Working Plan Area Croaghmann/Port Clair

Volumes in ~~1000~~ h. ft. over bark
Areas in acres

* Complete as necessary * Section Croaghmann * Working Circle * Felling Series

Year	B.H.Q.G. Classes	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
(1)	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
51	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
52	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
53	Total	11,746	7.0	-	-	2,162	1.5	-	-	9,584	5.5	-	-	-	-	-	-	
	2 1/2"-6"	10,028		-		1,554		-		8,474		-						
	6 1/2"-9"	1,718		-		608		-		1,110								
	Over 9"	-		-		-		-		-								
54	Total	48,827	55.0	-	-	740	1.0	-	-	48,087	54.0	-	-	-	-	-	-	
	2 1/2"-6"	40,949		-		592		-		40,357								
	6 1/2"-9"	7,878		-		148		-		7,730								
	Over 9"	-		-		-		-		-								
55	Total	78,998	119.25	3,746	13.0	11,288	26.5	-	-	63,964	79.75	-	-	-	-	-	-	
	2 1/2"-6"	58,590		3,452		10,634		-		44,504								
	6 1/2"-9"	20,408		294		654		-		19,460								
	Over 9"	-		-		-		-		-								

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

For

Working Plan Area Greagnewn/Port ClairVolumes in ~~000~~h. ft. over bark
Areas in acres* Complete as
necessary

* Section

Greagnewn

* Working Circle

* Felling Series

Species and Species Groups

Year	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Oc
		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)	
(1)	Total																	
	2 1/2"-6"																	
	6 1/4"-9"																	
	Over 9"																	
51	Total																	
	2 1/2"-6"																	
	6 1/4"-9"																	
	Over 9"																	
52	Total																	
	2 1/2"-6"																	
	6 1/4"-9"																	
	Over 9"																	
53	Total																	
	2 1/2"-6"																	
	6 1/4"-9"																	
	Over 9"																	
54	Total	4,884	-	-	-	-	-	-	-	4,884	-	-	-	-	-	-	-	
	2 1/2"-6"	3,474								3,474								
	6 1/4"-9"	1,410								1,410								
	Over 9"	-								-								
55	Total	860	-	-	-	-	-	-	-	860	-	-	-	-	-	-	-	
	2 1/2"-6"	450								450								
	6 1/4"-9"	410								410								
	Over 9"	-								-								

RECORDS INCOMPLETE

RECORDS INCOMPLETE

Working Plan Area Creagnameun/Port Clair

Volumes in 000-cu. ft. over bark
Areas in acres

* Complete as
necessary

* Section

Creagnameun

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Oc
		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)	
51	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
52	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
53	Total	11,746	7.0	-	-	2,162	1.5	-	-	9,584	5.5	-	-	-	-	-	-	
	2 1/2"-6"	10,028		-	-	1,554		-	-	8,474								
	6 1/2"-9"	1,718		-	-	608		-	-	1,110								
	Over 9"	-		-	-	-		-	-	-								
54	Total	53,711	55.0	-	-	740	1.0	-	-	52,971	54.0	-	-	-	-	-	-	
	2 1/2"-6"	44,423		-	-	592		-	-	43,831								
	6 1/2"-9"	9,288		-	-	148		-	-	9,140								
	Over 9"	-		-	-	-		-	-	-								
55	Total	79,858	119.25	3,746	13.0	11,288	26.5	-	-	64,824	79.75	-	-	-	-	-	-	
	2 1/2"-6"	59,040		3,452		10,634				44,954								
	6 1/2"-9"	20,818		294		654				19,870								
	Over 9"	-		-		-				-								

RECORDS INCOMPLETE

RECORDS INCOMPLETE

Record of Past Yields from Thinning/Felling

For

Working Plan Area Greengranny/Port Clair

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

* Complete as necessary * Section Port Clair * Working Circle * Felling Series

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	111,849	215.5	-	-	21,544	44.0	120	-	88,391	166.5	1,724	5.0	-	-	-	-	
	2 1/2"-6"	46,129				11,700		100		33,447		1,182						
	6 1/2"-9"	53,657				8,884		20		44,262		491						
	Over 9"	12,063				960		-		10,982		121						
62	Total	108,845	159.5	518	4.0	9,195	27.0	300	-	98,832	128.5	-	-	-	-	-	-	
	2 1/2"-6"	53,314		504		7,603		-		45,207		-						
	6 1/2"-9"	43,945		14		1,592		156		42,183		-						
	Over 9"	11,586		-		-		144		11,442		-						
63	Total	52,974	121.0	110	1.0	2,630	5.5	-	-	49,307	113.0	927	1.5	-	-	-	-	
	2 1/2"-6"	27,188		110		1,381		-		25,356		341						
	6 1/2"-9"	21,820		-		1,249		-		20,091		480						
	Over 9"	3,966		-		-		-		3,860		106						
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

Working Plan Area Creagmeun/Port Clair

Volumes in 000 cu. ft. over bark
Areas in acres

* Complete as
necessary

* Section

Port Clair

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	7,204	-	-	-	2,276	-	-	-	4,170	-	758	-	-	-	-	-	
	2 1/2"-6"	3,286	-	-	-	873	-	-	-	1,655	-	758	-	-	-	-	-	
	6 1/2"-9"	2,535	-	-	-	917	-	-	-	1,618	-	-	-	-	-	-	-	
	Over 9"	1,383	-	-	-	486	-	-	-	897	-	-	-	-	-	-	-	
62	Total	1,526	-	574	-	770	-	-	-	-	-	182	-	-	-	-	-	
	2 1/2"-6"	1,526	-	574	-	770	-	-	-	-	-	182	-	-	-	-	-	
	6 1/2"-9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Over 9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
63	Total	1,634	-	892	-	420	-	-	-	322	-	-	-	-	-	-	-	
	2 1/2"-6"	1,634	-	892	-	420	-	-	-	322	-	-	-	-	-	-	-	
	6 1/2"-9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Over 9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2 1/2"-6"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6 1/2"-9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Over 9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2 1/2"-6"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6 1/2"-9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Over 9"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Working Plan Area Creegannewy/Port Claf

Volumes in ~~1000~~ h. ft. over bark
Areas in acres

* Complete as
necessary

* Section

Port Claf

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
61	Total	119,053	215.5	-	-	23,820	44.0	120	-	92,561	166.5	2,552	5.0	-	-	-	-	
	2 1/2"-6"	49,415		-		12,573		100		34,802		1,940						
	6 1/2"-9"	56,192		-		9,801		20		45,880		491						
	Over 9"	13,446		-		1,446		-		11,679		121						
62	Total	110,571	159.5	1,092	4.0	9,965	27.0	300	-	98,832	128.5	182	-	-	-	-	-	
	2 1/2"-6"	54,840		1,078		8,373		-		45,207		182						
	6 1/2"-9"	43,945		14		1,592		156		42,183		-						
	Over 9"	11,586		-		-		144		11,442		-						
63	Total	54,608	121.0	1,002	1.0	3,050	5.5	-	-	49,629	113.0	927	1.5	-	-	-	-	
	2 1/2"-6"	28,822		1,002		1,801		-		25,678		341						
	6 1/2"-9"	21,820		-		1,249		-		20,091		480						
	Over 9"	3,966		-		-		-		3,860		106						
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

Working Plan Area Greengranny/Port Clair

Volumes in ~~000~~ h. ft. over bark
Areas in acres

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
56	Total	24,523	31.5	-	-	2,121	3.0	-	-	22,402	28.5	-	-	-	-	-	-	
	2 1/2"-6"	16,801		-		1,300		-		15,501		-		-		-		
	6 1/2"-9"	7,722		-		821		-		6,901		-		-		-		
	Over 9"	-		-		-		-		-		-		-		-		
57	Total	81,109	161.0	-	-	3,920	-	-	-	76,885	161.0	304	-	-	-	-	-	
	2 1/2"-6"	44,762		-		3,795		-		40,967		-		-		-		
	6 1/2"-9"	36,347		-		125		-		35,918		304		-		-		
	Over 9"	-		-		-		-		-		-		-		-		
58	Total	93,109	200.5	1,904	10.0	5,810	10.5	-	-	85,395	180.0	-	-	-	-	-	-	
	2 1/2"-6"	52,127		1,789		2,800		-		47,538		-		-		-		
	6 1/2"-9"	39,803		115		2,788		-		36,900		-		-		-		
	Over 9"	1,179		-		222		-		957		-		-		-		
59	Total	54,837	126.0	-	-	4,366	9.0	231	-	47,100	109.0	3,140	8.0	-	-	-	-	
	2 1/2"-6"	32,054		-		3,666		174		25,625		2,589		-		-		
	6 1/2"-9"	19,100		-		610		57		17,906		527		-		-		
	Over 9"	3,683		-		90		-		3,569		24		-		-		
60	Total	79,095	156.5	-	-	19,609	50.0	7,122	9.0	52,364	97.5	-	-	-	-	-	-	
	2 1/2"-6"	48,359		-		18,727		3,153		26,479		-		-		-		
	6 1/2"-9"	25,338		-		882		3,692		20,764		-		-		-		
	Over 9"	5,398		-		-		277		5,121		-		-		-		

Record of Past Yields from Thinning/Felling

For

Working Plan Area Greengrass/Port Clair

Volumes in ~~000~~ cu. ft. over bark
Areas in acres

* Complete as
necessary* Section Port Clair

* Working Circle

* Felling Series

Species and Species Groups

Year	B.H.Q.G. Classes	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
(1)	Total	34,135	-	-	-	1,478	-	-	-	32,657	-	-	-	-	-	-	-	
	2 1/2"-6"	13,712		-		1,228		-		12,484								
	6 1/2"-9"	20,423		-		250		-		20,173								
	Over 9"	-		-		-		-		-								
56	Total	37,373	6.0	-	-	10,316	-	-	-	27,057	6.0	-	-	-	-	-	-	
	2 1/2"-6"	30,550		-		7,687		-		22,863								
	6 1/2"-9"	6,823		-		2,629		-		4,194								
	Over 9"	-		-		-		-		-								
57	Total	23,198	6.25	-	-	5,773	0.5	-	-	17,425	5.75	-	-	-	-	-	-	
	2 1/2"-6"	7,411		-		1,600		-		5,811								
	6 1/2"-9"	12,884		-		4,173		-		8,711								
	Over 9"	2,903		-		-		-		2,903								
58	Total	2,087	-	-	-	646	-	-	-	1,441	-	-	-	-	-	-	-	
	2 1/2"-6"	817		-		594		-		223								
	6 1/2"-9"	1,067		-		52		-		1,015								
	Over 9"	203		-		-		-		203								
59	Total	29,639	-	-	-	994	-	437	-	25,972	-	2,236	-	-	-	-	-	
	2 1/2"-6"	7,618		-		845		165		6,040		568						
	6 1/2"-9"	12,770		-		149		250		11,041		1,330						
	Over 9"	9,251		-		-		22		8,891		338						
60	Total	29,639	-	-	-	994	-	437	-	25,972	-	2,236	-	-	-	-	-	
	2 1/2"-6"	7,618		-		845		165		6,040		568						
	6 1/2"-9"	12,770		-		149		250		11,041		1,330						
	Over 9"	9,251		-		-		22		8,891		338						

Record of Past Yields from Thinning/Felling

For

Working Plan Area **Creagmeun/Port Clair**

Volumes in 000's b. ft. over bark
Areas in acres

* Complete as necessary

* Section

* Working Circle

* Felling Series

Port Clair

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		O
		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)	
56	Total	58,658	31.5	-	-	3,599	3.0	-	-	55,059	28.5	-	-	-	-	-	-	
	2 1/2"-6"	30,513		-	-	2,528		-		27,985		-	-	-	-	-	-	
	6 1/2"-9"	28,145		-	-	1,071		-		27,074		-	-	-	-	-	-	
	Over 9"	-		-	-	-		-		-		-	-	-	-	-	-	
57	Total	118,482	167.0	-	-	14,236	-	-	-	103,942	167.0	304	-	-	-	-	-	
	2 1/2"-6"	75,312		-	-	11,482		-		63,830		-	-	-	-	-	-	
	6 1/2"-9"	43,170		-	-	2,754		-		40,112		304	-	-	-	-	-	
	Over 9"	-		-	-	-		-		-		-	-	-	-	-	-	
58	Total	116,307	206.75	1,204	10.0	11,583	11.0	-	-	102,820	185.75	-	-	-	-	-	-	
	2 1/2"-6"	59,538		1,789		4,400		-		53,349		-	-	-	-	-	-	
	6 1/2"-9"	52,687		115		6,961		-		45,611		-	-	-	-	-	-	
	Over 9"	4,082		-	-	222		-		3,860		-	-	-	-	-	-	
59	Total	56,924	126.0	-	-	5,012	9.0	231	-	48,541	109.0	3,140	8.0	-	-	-	-	
	2 1/2"-6"	32,671		-	-	4,260		174		25,848		2,589		-	-	-	-	
	6 1/2"-9"	20,167		-	-	662		57		18,922		527		-	-	-	-	
	Over 9"	3,886		-	-	90		-		3,772		24		-	-	-	-	
60	Total	108,734	156.5	-	-	20,603	50.0	7,559	9.0	78,336	97.5	2,236	-	-	-	-	-	
	2 1/2"-6"	55,977		-	-	19,572		3,318		32,519		568		-	-	-	-	
	6 1/2"-9"	38,108		-	-	1,051		3,942		31,805		1,330		-	-	-	-	
	Over 9"	14,649		-	-	-		299		14,012		138		-	-	-	-	

Working Plan Area Greengannou/Port Clair

* Complete as necessary

* Section

Port Clair

* Working Circle

* Felling Series

Species and Species Groups

Year (1)	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		C
		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)	
51	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
52	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
53	Total	59,976	105.0	-	-	6,856	16.5	2,521	5.0	49,520	82.0	1,079	1.5	-	-	-	-	
	2 1/2"-6"	52,657		-	-	6,715		2,061		42,925		956		-				
	6 1/2"-9"	7,319		-	-	141		460		6,595		123						
	Over 9"	-		-	-	-		-		-		-						
54	Total	86,614	122.0	-	-	9,308	19.0	-	-	77,306	103.0	-	-	-	-	-	-	
	2 1/2"-6"	78,944		-	-	8,551		-	-	70,393		-	-	-	-	-	-	
	6 1/2"-9"	7,670		-	-	757		-	-	6,913		-	-	-	-	-	-	
	Over 9"	-		-	-	-		-	-	-		-	-	-	-	-	-	
55	Total	62,657	109.7	-	-	12,365	32.25	1,509	4.0	48,358	73.45	425	-	-	-	-	-	
	2 1/2"-6"	45,691		-	-	11,857		1,249		32,379		206		-				
	6 1/2"-9"	16,966		-	-	508		260		15,979		219		-				
	Over 9"	-		-	-	-		-		-		-		-				

RECORDS INCOMPLETE

RECORDS INCOMPLETE

Working Plan Area Creagmeun/Port Clair

Volumes in ~~000~~ h. ft. over bark
Areas in acres

* Complete as necessary * Section **Port Clair** * Working Circle * Felling Series

Species and Species Groups

Year	B.H.Q.G. Classes (2)	Total		Pines		Spruces		Larches		D.F.		Other Conifers		Oaks		Beech		Ot
		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)	
(1)	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
51	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
52	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
53	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
54	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	
55	Total																	
	2 1/2"-6"																	
	6 1/2"-9"																	
	Over 9"																	

RECORDS INCOMPLETE

RECORDS INCOMPLETE

Chapter 13 - Regulation of Yield

(a) Forms W.P. 13: Record of Yields from Thinning/Felling

Although the Forms WP 13 (above) cover an eleven year period those covering the last five years are of most interest. They show considerable fluctuations in the actual thinning yield although in actual fact the volume sold annually was more or less regularised. The reason for these fluctuations is that the thinnings on both Forests (in conjunction with Inchnacardoch) were sold on a Long Term Contract from December, 1959, which coincided with the calendar year but not the forest year. Thus it was possible in any one forest year for the merchant to do very little or no thinning or on the other hand do two years thinning in one.

This in fact happened and has been more accentuated by fluctuations in the markets.

All Felling volumes have been from windblows or roadline fellings.

(b) Methods of Yield Regulation

(1) Thinning

In 1956 a series of 1/10th acre plots were laid down in an attempt to assess the standing volumes and consequently calculate a theoretical yield.

Following this the thinning grade was set at C/D and the thinning cycle at five years. Port Clair Forest was divided into two blocks which were each subdivided into five equi-productive areas in order to facilitate Forestry Commission and Trade working. Creagnaneun was subdivided into five equi-productive areas and given over to Trade working.

The implementation of the regulation of the yield on these lines depended on a fairly large road programme and the availability of markets. In consequence there has been very little Forestry Commission working and continuity in the Trade working has been due to the Long Term Contract with P. McAlinsh Limited, and fluctuations have been only within the conditions of the contract.

(2) Felling

There has been no regulation of the Fellings silviculturally. They have been regulated by windblows and the demands for roadline clearance.

Chapter 14 - Forest Roads and Access(a) Construction

Roading began on a small scale more than ten years ago. The first road on the area to be aligned was on Creagnaneun (in 1952) and gave access to the glen formed by the Allt Saigh. The next road was the continuation of the Estate road at Dalcataig on Port Clair (in 1954) parallel to the River Moriston.

Since then the road systems on both Forests have expanded, that on Port Clair is nearly adequate for the thinning requirements of the near future and that of Creagnaneun is now rapidly expanding to meet the thinning commitments of the immediate future.

The completed mileage of roads as at 30th September, 1963 is as follows:-

Port Clair Forest

Category 1	-	15.1 miles
Category 2	-	<u>1.5 miles</u>
Total		<u>16.6 miles</u>

Creagnaneun Forest

Category 1	-	6.2 miles
Category 2	-	<u>1.2 miles</u>
Total		<u>7.4 miles</u>

In addition County Roads adjoining the Forests amount to:-

<u>Port Clair Forest</u>	-	3.0 miles
<u>Creagnaneun Forest</u>	-	7.0 miles of which only 2 miles are of any real use, on account of rock outcrops.

The original specifications used were of a less exacting nature than at present, the main objective being to gain access without too much attention to grade. However, some of the early roads have had to be improved and brought up to the present specifications which are as per HM 2A of September, 1961. Briefly this means minimum gradient 1 in 500 and maximum gradient 1 in 10; maximum radius of curvature 45 feet, with a finished road width varying from 10 feet on the straight to 16 feet on radius curves.

In practise the present roads only exceptionally exceed a grade of 1 in 14 with a bank batter where possible of 1 in 1 to $1\frac{1}{2}$ to 1. Passing places are provided at approximately 400 yard intervals.

The early roads were laid out with horse extraction in mind and the interval between roads was between 250 and 300 yards. However the present roading density is based on the Directorate Instruction of May, 1963 i.e. that the first road should be 135 yards from the lower edge of the forest and intermediate roads 270 yards apart. The top road should not be more than 150 yards from the top of the forest. The emphasis being on winch extraction but not necessarily excluding the horse.

Sources of road metal have been good, notably at the Bhlaraidh Tunnel Spoil Bing and quarried material obtained from roadsides at Creagnaneun in the Old Red Sandstone. Local moraines have also been used in the Achnaconeran area and in the low lying regions at the Inverwick end of Port Clair Forest.

(b)/

(b) Maintenance

The day to day maintenance of the roads has been the responsibility of the Forest Staff. A roadman is employed more or less full time on Port Clair Forest and maintenance is well up to date. As yet there is no roadman on Creagnaneun and consequently road maintenance is in arrears.

Any major repairs which have been required have been undertaken by the specialist Engineering Staff.

(c) Access

There are three main accesses for the extraction of timber on each Forest.

Port Clair

- (i) Forest Road at Rudha Ben.
- (ii) Shared Estate Road at Dalcataig.
- (iii) Servitude Right of Way over the approach to the Bailey Bridge near Bhlaraidh Burn, Glemmoriston.

Creagnaneun

- (i) Access to Achnaconeran Section and Creagnaneun one mile west of Invermoriston.
- (ii) The main access to the centre of the Forest on the east side of Allt Saigh.
- (iii) The Bark Shed Access at the extreme east end of the Forest.

Chapter 15 - Powered Vehicles and Machines

(a) Transport

At present the official vehicles on the area are one 5 ton Thames Trader Lorry and one B.S.A. Bantam Motor Cycle, both on Port Clair Forest. In addition the two Foresters in charge have small private car allowances.

The 5 ton Lorry's main use is transporting workers, and it is due to be replaced by a van or a pick-up which will be much more versatile.

(b) Other Mechanical Equipment

There is no Fire Pump on the area but the equipment at Inchnacardoch and Ceannacroc can always be called on if necessary.

(c) Availability of Mechanical Equipment from other Sources

Ploughing outfits are available from the Conservancy Pool.

(d) Maintenance and Repair

A Conservancy Inspection Mechanic makes regular inspections of all mechanical equipment held at the forests. Inspection reports are forwarded to the Conservancy Mechanical Engineer for action where necessary. Breakdowns in the interval between inspection are recorded on a defect report which is submitted by the Forester to the Conservancy Engineer whose action, depending on the nature and extent of the repair, is:-

- (i) For small repairs a mechanic is sent from a Conservancy Workshop to effect the repair.
- (ii) For repairs costing up to about £5 which cannot be undertaken at the forest the vehicle may be towed or driven to the local garage.
- (iii) If the repair is a relatively big and expensive one involving crawlers or diggers the repair is carried out in the Directorate Workshops at Chapelhall unless overhauled replacement parts are available, e.g. engines and track assemblies, in which case the Conservancy Workshops fit these.

Major repairs to other mechanical equipment are carried out in Conservancy Workshops. If repairs are likely to take more than a week, a replacement machine is normally available from Directorate Workshops in the case of crawlers and from Conservancy Workshops in the case of lorries or vans.

The forests in this area are served by the Workshop at Longman, Inverness.

Chapter 16 - Marketing and Exploitation(a) Marketing

The only market in the near locality at present is that of Bonawood Chipboard Mill at Inverness. Prior to the building of this mill the main outlet for small round timber and the smaller sawn timber was the Coal Board.

(1) Standing Sales

All thinnings in the area are now sold standing as part of or supplementary to Contract 582, a five year Standing Sale Contract signed by Peter McAinsh Limited in December, 1959 and embracing Inchnacardoch, Creagnaneun and Port Clair Forests. The prices obtained from F.Y. 60-63 have been respectively 1/1d., 1/2d., 1 1/2d. and 8 1/2d. per hoppus foot.

In addition reasonably accessible road lines and windblows have been sold standing to the same merchant.

The following merchants have bought standing sales on the area since 1950.

W. Carmichael & Son
The Caledonian Propping Company
A. Maislish & Son
A. J. Munro
A. Cowie
H. D. Armstrong Ltd.
P. McAinsh Ltd.

(2) Commission Working

Records of the early thinnings are not available but in recent years Commission working has been on a very small scale.

The last thinnings worked by the Commission on both Forests was in 1959 when the produce was sold at roadside on a two year Roadside Sale Contract to A. Tulloch & Sons Limited. At Port Clair the work was done by forest labour but at Creagnaneun a contractor was employed.

Since then any work undertaken has been confined to the clearance of windblows and roadlines the produce being sold to H. D. Armstrong Limited and latterly P. McAinsh Limited.

(b) Exploitation(1) Standing Sales

Coupes have varied in size depending on the out turn per acre of the thinnings, it being the aim to divide the forest into equi-productive blocks rather than four blocks of equal size.

The Tariff system of measurement has been used for all enumerations pertaining to the present Long Term Contract and subsequent sales of windblows and road line trees. Supervision of the enumerations has been the responsibility of the Foresters in charge.

Protective measures include the protection of main water courses particularly road culverts, the protection of the standing crop from damage by careless extraction and stump protection with creosote against Fomes annosus.

Extraction has been by horse or winch and exceptionally, down very steep slopes, by hand.

Conversion/

Conversion in the Forest has been chiefly the cross cutting of produce into mill wood and pit wood. At selected sites propping of mining timber has been done.

(2) Departmental Working

This work is now confined to the clearance of windblow and road lines and in most cases contractors have been employed. Exceptionally a felling squad from Inchnacardoch has been loaned for emergency working.

Measurement is all done by the Tariff system.

The only conversion has been the crosscutting of big trees into manageable lengths for extraction.

Costs

Felling approximately 6d. per hoppus foot
Extraction approximately 6d. per hoppus foot

The Produce Account for Commission working in 1962 shows:

Port Clair a deficit of 1.12d. per hoppus foot
Creagnaneun a surplus of 1.97d. per hoppus foot

(c) Observations on the Relative Merits of Standing Sales and Department Working

The preference at present is to sell thinnings standing and the main reason can be seen from the statement of Accounts for 1962 which show:-

	Volume	Surplus Deficit	Surplus/ Deficit per H.ft.
F.C. Felling			
Port Clair	3,391	- 15.17. 8	- 1.12d.
Creagnaneun	11,958	+ 98. 7. 5	+ 1.97d.
Sales Standing:			
Port Clair	117,398	+5265. 7. 7	+10.76d.
Creagnaneun	25,550	+1111.16. 5	+10.44d.
Total Port Clair	120,789	+5249. 9.11	+10.43d.
Creagnaneun	37,508	+1210. 3.10	+ 7.74d.

Standing Sales in the past have shown a much higher surplus. It may be argued that the price for Commission worked timber has been low on account of poor markets, but allowing for this the overheads are so much higher than for standing sales.

Chapter 17 - Risks(a) Animals

Red deer, roe deer and foxes are the animals requiring most control on the area, rabbits are few and voles have not shown themselves as a problem.

Red deer are present in appreciable numbers on both Forests chiefly on account of damage to the march fences already referred to in Chapter 11 (a). Extermination, now the fences are secure, will be a difficult undertaking but will be necessary before replanting (particularly on Port Clair) is undertaken.

Roe deer are quite numerous but are not such a great problem as red deer. So far no selective control of roe deer has been attempted.

Foxes have been trapped and shot where possible and a concerted effort is made at cubbing time to clear dens.

(b) Birds

Black Game are present in the area and although a problem in the early years of establishment have not done any great damage in the more recent plantings. No measures have been taken in recent years to reduce numbers.

The capercaillie is present on Inchnacardoch and Ceannacroc Forests but has not been reported from this area recently.

(c) Insects

Pine Weevils have occasionally been active after windblows and fellings on neighbouring ground. Didimac was used on the research plantings of windblown areas in Port Clair in P.59 and also in P.60 and P.61 on Creagnaneun and proved quite successful.

The Pine Shoot Beetle is present and increases temporarily after thinnings in Scots pine but no serious damage has occurred.

(d) Weeds

Generally weeding has followed normal practice. The only exception has been the treatment of Hazel Coppice Stumps with Kilbest M on the P.63 and P.64 areas. Results to date have been good.

(e) Fungi

Fomes annosus is present and there are instances of butt rot particularly in European larch and Norway spruce on Port Clair.

Armillaria mellea caused many deaths in the early years but at present does not show itself as a problem.

The only protective measure taken against fungal attack is the creosoting of all stumps after thinning, as per standard Conservancy practice.

(f) Climate

Generally the climate is conducive to tree growth. Exceptionally storms cause windblow and more exceptionally dry spells cause drought cracking as in 1955.

Drought in the more eastern part of Creagnaneun has in the past reduced water supplies to the Forester's House and the Forest Workers' Holdings but a new water supply now prevents this.

(g)/

(g) Trespass

Danger to the Forests from trespass is very slight.

Creagnaneun is used by a number of hostellers from Allt Sigh Youth Hostel but so far they have not endangered the forest.

(h) Atmospheric Pollution

Nil.

(i) Fire

Details of the fire protective measures at present adopted are given in the Standing Fire Plan. The provisions which call mostly on the forest labour is the cutting of rank vegetation on the roadsides and the spraying of whins with Brush Killer.

During the muirburning season much time is spent burning protective strips on the marches when our neighbours want to burn. This applies particularly to Creagnaneun and the crofters at Achnaconeran.

Recent plantings have been small and there are few protective belts of Japanese larch considering the planted area of the Forests.

Roading is nearing completion on Port Clair, but is going on apace at Creagnaneun and has helped to reduce fire danger on account of increased accessibility.

Chapter 18 - Nursery

There was a Forest Nursery on Port Clair for many years but it was closed down in 1956. It was opened up again for a year in 1958 to absorb a small number of plants.

Plants required for the area are supplied in normal years from the Black Isle and Inchnacardoch nurseries but in exceptional years when there are shortages, supplies may come from Dornoch and South Laggan nurseries or even further away.

Chapter 19 - Staff and Labour(a) Staff

The following officers and Foresters have been directly connected with the Forests.

<u>Year</u>	<u>District Officer</u>	<u>Divisional Officer</u>	<u>Conservator</u>
1920	G. Home	F. Scott	
1928	J. W. Mackay		
1929	H. C. Beresford-Peirse		
1931		J. Fraser	
1935	W. N. Gibson		
1937	D. S. Spraggan		
1939		D. S. Spraggan	
1941	W. N. Gibson		
1942		A. Watt	
1943	D. S. Spraggan		
1945			J. Fraser
1948		J. T. Fitzherbert	
1949	R. O. Drummond	J. A. Dickson	
1952	R. A. Innes		
1956	G. F. D. Savage	J. Chrystall	J. A. Dickson
1958	J. A. Drummond		
1962	A. Ray		
1963			H. A. Maxwell

Head Foresters, Foresters and Foremen

	<u>Port Clair</u>	
1920	J. Cameron	Head Forester
1920	J. MacEwan	Forester
1939	H. Pennet	Forester
1941	J. MacEwan	Forester
1949	H. Lambie	Forester
1951	A. W. Officer	Forester
1961	J. MacKay	Forester

	<u>Creagnaneun</u>	
1926	W. MacIntosh	Forester
1927	W. MacClymont	Forester
1931	C. MacDonald	Forester
1932	R. Campbell	Forester
1938	C. MacDonald	Forester
1940	G. Munro	Forester
1941	J. MacEwan	Forester
1946	J. B. Fell	Forester
1951	D. Watt	Foreman
1953	T. Fraser	Foreman
1955	T. Fraser	Forester

Present Staff

District Officer	A. Ray
Foresters	J. MacKay - Port Clair
	T. Fraser - Creagnaneun
Asst. Forester	D. MacIntosh - Port Clair

The present staff is adequate apart from the fact that assistance at Creagnaneun is required part time from the Assistant Forester at Geannacroch.

(b)/

(b) Labour

The present labour strength on the area is fifteen, eight at Port Clair and seven at Creagnaneun Forest.

The age structure is:-

Age Group	Port Clair Number	Creagnaneun Number	Total Number
15-20	1	3	4
21-30	-	1	1
31-40	4	1	5
41-50	-	-	-
51-60	3	2	5
61-65	-	-	-
Total	8	7	15

The labour strength in terms of grades and establishment is:-

Grade	Creagnaneun		Port Clair		Total	
	Estab.	Non Est.	Estab.	Non Est.	Estab.	Non Est.
Gangers	1	-	-	-	1	-
Trapper G.I.	-	-	1	-	1	-
Horsemen	-	1	-	-	-	1
Grade I	-	-	1	3	1	3
Grade II	1	-	-	-	1	-
Grade III	-	1	-	2	-	3
Boys	-	3	-	1	-	4
Total	2	5	2	6	4	11

The wastage rate is now normal but prior to the closing of the Port Clair Hostel the run down had been fairly rapid.

Recruitment of labour of the right kind is difficult but at present the four boys on strength show promise.

The percentage of piecework is low mainly on account of the lack of enthusiasm and capability of the workers.

There are thirteen houses on the area and more details will be given in Chapter 20.

The workers on Port Clair are transported from their reporting point to their places of work by lorry, but there being no official transport on Creagnaneun the workers either walk or cycle from the reporting points.

The reporting points are:-

- | | |
|--------------------|-----------------------------------|
| Port Clair Forest | 1. Forester's Office |
| Creagnaneun Forest | 1. Forester's Office, Allt Sigh. |
| | 2. 'T' Junction at Invermoriston. |

Chapter 20 - Houses and Holdings, Other Buildings and Special Installations(a) HousesPort Clair

<u>Type of House</u>	<u>Present Occupant</u>	<u>Desirable Occupant</u>
1 detached bungalow (Forester's House)	Forester	Forester
1 detached cottage	Trapper	Trapper
2 semi-detached bungalows F.W.H. 2 F.W.H. 3	Forest Worker Forest Worker	Forest Worker Forest Worker
2 semi-detached corrugated iron bungalows Nursery Cottage 1 Nursery Cottage 2	Forest Worker Retired Hostel Cook	Forest Worker Retired Hostel Cook

Greagnaneun

1 detached Dorran bungalow Forester's House	Forester	Forester
1 detached bungalow formerly F.W.H. 3 and Forester's House	Empty	(i) Asst. Forester (ii) or Forest Worker
2 semi-detached bungalows formerly F.W. H. 1 " F.W.H. 2	Contractor Mobile Worker	Contractor Mobile Worker
1 Stone Built House Allt Sigh Cottage	Empty	Forest Worker or Mobile Worker
2 semi-detached stone houses at Allt Sigh 1. 2.	Ganger Forest Worker	Ganger Forest Worker

Existing Arrangements for buildings etc.

Once the empty houses are filled the existing arrangements are sufficient for the Forest, but the Forester's House at Port Clair is substandard and is to be replaced.

The Nursery Cottages are substandard and may or may not be replaced depending on the labour requirements.

The main need for housing is for mobile workers and contractors. This need could be answered by an extension of the County Council Estate in Invermoriston.

(b) Other Buildings

The other buildings on the area are:-

Port Clair

The Forest Office made from part of the old Hostel, the remainder of the building being used as a tool store.

The combined main store, stable and hay store.

The lorry garage which also houses the fire equipment.

The/

The petrol and oil store.

Creagnaneun

The Forest Office at Allt Sigh.

The combined stable and Tool Store.

The tool shed and wet weather hut at Achnaconeran.

Wet weather shelters are of a temporary nature being made out of a tarpaulin.

On the whole the area is well equipped with buildings but a new Forest Office incorporating a tool maintenance section is desirable at Creagnaneun.

Experiment 5 P59 (GC) Location: Near Experiment 4

Project: 413.5 Deer control.
 451.2 Deer damage.

Object: To test the effect of protecting plants with branches and wire netting (laid on the ground) in cleared groups within a standing crop.

Results: No treatment gave consistent effective protection.
Experiment closed, returned to Conservancy 1961.

[illegible]

Project: 230.9 } As for Experiment 3.
232.11 }

Object: To make a simple trial of Nothofagus obliqua and Nothofagus procera.

Results: Nothofagus procera satisfactory, Nothofagus obliqua not very good, many dead shoots. Plants of both species were badly frosted at planting.

(ii) Sample Plots

Port Clair

Sitka spruce - S.202 Area .320 acres. C/D Compartment 30
Grid reference: NH 41944 Blown January 1957
and abandoned.

Abies grandis - S.203 Area .376 acres. C/D L/C (1952)
Compartment 19.

Norway spruce - S. 204 Area .272 acres. C/D Compartment 36.

Creagnaneun

Douglas fir - S.205 Area .343 acres. C/D Compartment 31.

(b) Investigation by Local Staff

No investigations have been undertaken by the staff in recent years. There are no Indicator Sub-Compartments.

Chapter 22 - Other Factors

Nil.

TABLE I - FORT CLAIR AND CREAGNANEON
AREA AND AGE CLASS DISTRIBUTION
at 30/9/63

Classification	Area acres	P.61-70	P.51-60	P.41-50	P.31-40	P.21-30	Over 40 yrs.
High Forest							
Conifers	3,922	181	5	515	1,122	2,044	55
Mixed	-						
Hardwoods	-						
TOTALS	3,922	181	5	515	1,122	2,044	55
Plantable	41						
Other	3,721						
	7,684						

TABLE II - PORT CLAIR AND CRRAGNANUM
Existing Crops - Volumes and Measurements of Main Species Including Mixtures
at 30/9/63

Species	Total Area	Area Classification			Average Q.C.	OOO's hoppus feet		OOO's hoppus feet	
		Quality Class I-V	Below Quality Class V	Not Classifiable		Measurable Volume	C.A.I.	Classification of Volume	% of Volume
Scots pine	581	423	125.5	32.5	III	501.8	41.8	2 1/2" - 6" 6 1/4" - 9" 9 1/4" - 12"	83 16 1
Douglas fir	1,152	1,083.5	22	46.5	III	3,607.8	223.	2 1/2" - 6" 6 1/4" - 9" 9 1/4" - 12" 12 1/4" - 15" 15 1/4" - 18"	14 48 33 4 1
Norway spruce	1,317	603.5	713.5	-	IV	966.9	77.8	2 1/2" - 6" 6 1/4" - 9" 9 1/4" - 12"	71 27 2
Sitka spruce	668	199	376	93	IV	570.7	53.4	2 1/2" - 6" 6 1/4" - 9" 9 1/4" - 12" 12 1/4" - 15"	33 45 20 2
Abies grandis	35	37	1	1	III	128.7	11.8	2 1/2" - 6" 6 1/4" - 9" 9 1/4" - 12" 12 1/4" - 15"	26 55 14 5

TABLE III - POFT CLAIR AND CREAGNANEN
Volumes and Increments of Main Species and Mixtures

at 30/9/63

Species	Total Area (acres)	Area of Measurable Timber (acres)	Total Volume 000's h.ft.	Average Volume by Measurable Acres hoppus feet	Total C.A.I. 000's h.ft.	C.A.I. per Measurable acre hoppus feet
Scots pine	561	423	501.6	1,185	41.8	98
European larch	52	52	82	1,570	4.3	82
Japanese larch	35.5	21	42.2	2,000	2.4	114
Norway spruce	1,317	603.5	966.9	1,600	77.8	129
Sitka spruce	668	199	570.7	2,865	53.4	268
Abies grandis	39	37	128.7	3,300	11.8	303

PART II

Chapter 24 - SUMMARY OF FACTS ON WHICH TO BASE PROPOSALS

(a) Forest Conditions and Potential

The working plan area is situated on the north side of Loch Ness and extends for a distance of 10 miles from Inchnacardoch Forest boundary in the south-west to the Grataig Burn in the north-east and is continuous apart from a narrow strip of land in Glenmoriston which is the property of Glenmoriston Estates.

The nearest large town is Inverness which is 22 miles distant from the east end of the forest and 32 miles from the west end. The west end is 1 mile distant from the village of Fort Augustus.

The forest area is sufficiently far inland to be unaffected directly by coastal winds but is open to the winds which funnel through the Great Glen. Wind damage has not as yet been serious, although the gale experienced early in 1957 was responsible for the creation of small gaps here and there.

The average rainfall for the area is about 45 inches and is fairly evenly distributed over the year, the driest period being experienced in late spring. Snowfalls are not usually heavy but frosts can be severe.

The basic rocks are of two main types: on the area to the east of the Allt Saigh Burn the rocks are sandstone of the old Red Sandstone age and elsewhere are schists of the Moine series.

The area of old Red Sandstone is entirely free of drift, the soils being derived directly from the sandstone.

Overlying the Moine schists are deposits of Gray and Red Boulder Clay with the former being the lower or basal layer. The Gray Boulder Clay is present at all elevations and varies in depth, being deepest in the valley bottoms and on flats and terraces. The clay is somewhat gritty, stiff and tough and is impermeable to water. The Red Boulder Clay is red or brownish red in colour, of a sandy gravelly texture which is readily permeable by water; this upper layer is found at levels between 100 feet and 700 feet and is spread over the bulk of the schistose area apart from a small area at the head of the Moriston valley. Valley moraines are found in the vicinity of the River Moriston and are generally of a gravelly nature but with finer materials intermixed; associated with these are river gravels.

The soils derived from the old Red Sandstone are true mineral soils: they are reddish brown in colour and of a coarse sandy texture, very stony and usually overlying rock fragments. The slopes occupied by the old Red Sandstone are very steep and but for the strata dip, which is into the slope, erosion must have been severe. As it is the trees secure root holds along the bedding planes while soil formation is assisted by the trapping of rock fragments and plant debris in the crevices so formed; drainage is also directed into the cracks and a straight run off, and consequent erosion, is largely avoided. Due to the steep nature of the ground the soil depth varies considerably being deepest on the more gentle slopes and flats and shallow on the steeper slopes.

The soils derived from the Red Boulder Clay are reddish brown sandy loams of good depth on the lower and middle slopes but are inclined to be of a more gravelly nature on the flats and hummocks in the Moriston valley.

Soils derived directly from the old Red Sandstone and from the Red Boulder Clay cover some 2,600 acres of the forest area.

Peat/

Peat formation is confined to an area nearing the plantable limit where it is generally shallow over mineral soil. Amorphous type peats occur on small flats and depressions at lower elevation and are, as a rule, highly fertile. Areas of these two soil types are 1,200 acres and 150 acres respectively.

(b) Existing Crops and Increments

The principal species used to stock the planted area of 3,922 acres have been Norway spruce 1,317 acres and Douglas fir 1,152 acres. Other acreages are Sitka spruce 668 acres, Scots pine 581 acres, European larch 54 acres, Japanese larch 35.5 acres and Abies grandis 39 acres.

Volumes and increment details for the main species are shown in Table II.

Scots pine - 581 acres

The average Quality Class of Scots pine is III and of the total area planted - 423 acres have reached Quality Class V or better. Growth has been best on the more sheltered mineral soil sites where Quality Class II standard has been attained. As the elevation and the depth of peat overlying the mineral soil increased the rate of growth has correspondingly decreased until, on the deep peats at high elevation, extremely slow growth, not up to Quality Class V standard, has resulted. On the latter type of site Pinus contorta would have been a more profitable species.

Stem form is on the whole satisfactory, particularly in the higher quality class stands.

Douglas fir - 1,152 acres

The average Quality Class of Douglas fir is III but there are some very good quality Class I and II stands to be found on the lower and drier creep soil slopes. Volume production has been satisfactory but on the moister sites stem form has been adversely affected by butt sway. From Sitka spruce's performance on similar sites at both forests there is little doubt but that it would have produced an equal volume of much higher quality timber. Douglas fir has been less stable on these moist soils, there having been some losses by windblow.

The stem form of Douglas fir on the drier, rock fragmented slopes is sound and straight.

Norway spruce - 1,317 acres

The average Quality Class of Norway spruce is IV. It has grown well when properly sited, there being 603 acres of quality Class I-IV stands. On the other hand, when planted on inadequately prepared sites with the wrong vegetation type, results have been very poor: in this respect out of 544 acres established in the P21-P30 period 242 acres have as yet failed to reach quality class standard.

Stem form in the classifiable stands is good but the timber quality is in some cases reduced by the presence of heart rot.

Volume production in the Quality Class I-IV stand sites would have been much higher had they been stocked with Sitka spruce.

Sitka spruce - 668 acres

The average Quality Class of Sitka spruce is IV. Like Norway spruce, when planted on creep soils and flush peats at low elevation, it has produced quality Class I, II and III stands. Poorest results have been obtained where it was badly sited on poorly drained calluna covered/

covered peats during the P21-P30 period; out of 275 acres planted during this period 145 acres have so far failed to reach classifiable standard.

Stem form is good with no evidence as yet of heart rot such as is present on a small scale in Norway spruce.

Where Norway spruce and Sitka spruce have largely failed on the calluna covered peats Pinus contorta, of which only 3 acres have so far been planted on the working plan area, would have given better results.

European larch - 54 acres

The average quality class of European larch is III and although there are quality class II stands the stem form throughout is poor and windswept. It has been planted on creep soils which would have been more profitable if cropped with Sitka spruce or Douglas fir.

Japanese larch - 35.5 acres

Like European larch the average quality class of Japanese larch is III and although there is butt sweep it is less marked than in the European larch stands. Early plantations were formed on creep soils but more recent plantings have been done on a range of sites to provide fire protection belts. The 21 acres of creep soils stocked by this species would have given a better return if stocked with Sitka spruce or Douglas fir.

Abies grandis - 39 acres

Abies grandis has been planted on deep mineral soil flats where it has grown rapidly; it has averaged quality class III and although volume per acre is as yet just below that of Douglas fir the C.A.I. is very much higher and will undoubtedly eventually succeed in producing the highest yield per acre of any species capable of being grown in the working plan area. An attractive feature of the species is its comparative freedom from Fomes attack but less attractive is the brittle nature of the timber.

Other Species - 75.5 acres

There are small acreages of hybrid larch, Abies procera, Tsuga heterophylla, Lawson cypress, Pinus contorta, Picea canadica, mountain pine and Thuja plicata, much of which have been planted in groups in the vicinity of public roadsides for amenity purposes.

The broad picture of the working plan area is then one of all species growing vigorously on the lower and middle creep soil slopes but with a slowing down as the plantations reach the less fertile soils at higher level. At Port Clair the scar caused by the big fire of 1942 is noticeable on the hillside to the west of Invermoriston by a marked difference in the development of the original and replanted crops. Windblow has not as yet caused any large clearings but small patches are noticeable here and there along the public roadside. Nevertheless the general impression is one of full stocking and of healthy vigorous growth.

(c) Choice of Species and Techniques

When planting began - Port Clair in 1920 and Creaganeun in 1926 - a fair indication of the working plan areas potential was available from acquired plantations of European larch, Japanese larch, Douglas fir and Sitka spruce on Inchmacardosh and stands of European larch and Norway spruce on Port Clair. Remnants of Caledonian pine on both forests gave an indication of the potentialities of Scots pine.

In the early years choice of species followed the pattern of the times/

times in that Douglas fir was allocated to the deep fertile creep soil sites of the lower and middle slopes with some Sitka and Norway spruce in the moister hollows and flushes. European larch and Japanese larch were planted on a small scale on the drier convex slopes and ridges. Norway spruce and Sitka spruce were largely used to stock the shallower creep soils and much of the peats at higher elevation. Scots pine was selected for the shallow peat covered minerals on slopes and flats but was also planted on exposed rocky ridges.

From about 1930 onwards Abies grandis, Abies procera and Tsuga heterophylla were introduced on a small scale on the lower creep soil sites.

Results have been typical of much of the early Commission plantings in that species planted on creep soil sites developed normally whereas the species used to stock sites where ground preparation in the form of intensive drainage was necessary have been disappointing: the good performance of Douglas fir, Norway spruce, Sitka spruce and Abies grandis on creep soils and the poor performance of Scots pine, Norway spruce and Sitka spruce on undrained calluna covered peats typifies this.

Present day selection of species would stock the drier rock fragmented creep soils with Douglas fir and the deeper and more moist sites with Sitka spruce. Scots pine would be planted on the shallower peat covered mineral soils while Sitka spruce would be used on the amorphous flush type peats, and on molinia peats. Pinus contorta would be planted on a much greater scale on the calluna covered deep peats at high elevation and on the poorer of the sites at present stocked with Scots pine.

(d) Reserves of Plantable land

The reserve of plantable land is 122 acres, all of which is in hand.

The possibility of acquiring further land in the near vicinity is not great as the working plan area is bounded by Inchnacardoch, Ceannacroc and Glenurquhart forests and is largely dependent on acquisition from Glenmeriston Estates which has its own Dedication programme. There are, however, considerable areas of plantable land on the estates of Glendoe, Culachy, Dell and Aberchalder and although these are at present firmly held they are within working range should they ever become available.

(e) Produce and Markets

The C.A.I. of the working plan area which has reached measurable size is 421,000 hoppus feet of which some 200,000 hoppus feet should be removed annually in thinnings.

All thinnings are at present sold standing under a five year contract which expires in F.Y. 65. The volume sold in the past three years, F.Y. 61-63 inclusive, has been 388,000 hoppus feet. The converted timber finds its way mainly to the coal mining industry in the form of round props and saw-mining timber but a proportion of the Douglas fir is converted into house building timber.

Quantities of small round wood have also been consigned to the Chipboard Factory in Inverness.

From F.Y. 66 all of the small round wood is scheduled for consignment to the pulp mill now in the process of being built at Corpach, Fort William.

(f) Staff and Employment

(a)/

(a) Staff

The existing staff of two Foresters and one Assistant Forester is adequate.

(b) Labour

The present labour strength is 15, 8 of whom are at Port Clair and 7 at Creagannasun. Of the 15, 4 are established: 9 are under 40 years of age, the other 5 being between 50 and 60 years of age. This number is adequate so long as timber production work is undertaken by the trade. If worked by Forestry Commission a further 20 workers would be required.

The quality of the labour is fair and wastage, other than from retirements, is normal. Recruitment is fairly difficult, there being some competition for labour from timber merchants, public works contractors and to a lesser extent estates.

The Forester and 4 Forest Workers are tenants of Forestry Commission houses at Port Clair, while at Creagannasun the Forester and 2 Forest Workers are housed in Forestry Commission property.

The proportion of work done on piecework is low, little enthusiasm being shown by the workers for this method of working.

Roads

The total mileage of roads required to serve the working plan area of 3,963 acres is 40 miles. Of this total 24 miles have already been constructed and of the balance 14 miles are required within the period of the plan. The remaining 2 miles are not required until after 1970.

Because of the steep slopes road making has not been easy but costs have been improved by the availability of tunnel spoil resulting from the Hydro Board's workings in Glen Moriston.

Chapter 25 - OBJECTS OF MANAGEMENT

A. Like many of the early Commission planted forests the site potential of the Working Plan area has not been fully realised and this has been largely due to the inadequate form of ground preparation practised in the early years and to the species selection in favour at that time. It is, however, largely on the performance of these early plantations that the recommendations proposed to achieve greater productivity are based.

The tables show that the outstanding species so far as volume production is concerned has been Douglas fir, but what they do not reveal is the rather inferior quality of the stem form due to butt sway, a fault which is fairly common where it has been planted on the more moist creep soil sites. In addition to poor form there are also indications by small blows here and there that the stability of this species is more suspect under these conditions than when grown on the drier, rock strewn slopes where there are some high quality stands of good tree form. On the other hand there is convincing evidence at both forests to show that similar type moist sites are capable of growing high quality class stands of Sitka spruce. Tree form in these stands is excellent, volume production is equal to that of Douglas fir and, because of the higher quality sawtimber content of the trees, of much greater value. Increased profitability would therefore be achieved by planting Sitka spruce on all but the driest of the creep soil sites which would, as at present, continue to be stocked with Douglas fir.

Norway spruce has also grown well when planted on the creep soils but there is now little doubt that had the 600 acres of quality Class I-IV of this species been planted with Sitka spruce it would have produced equal quality class stands which on a 55/65 year rotation, would have raised the yield by some 2,000-3,000 hoppus feet per acre. As present day valuation of spruce logs - and the foreseeable - is based on size rather than on whether the species is Norway or Sitka spruce it is clearly, on these grounds, more profitable to grow the more rapid producing Sitka spruce wherever the sites are suitable for this purpose. Second rotation crops on these sites should therefore also be of Sitka spruce.

Modern methods of ground preparation and manuring would considerably increase the productivity of the peat sites at higher elevation and in the light of experience the species most suited to these conditions are Sitka spruce on molinia and amorphous type peats and Pinus contorta elsewhere. Pinus contorta when planted on calluna covered sites at the neighbouring forest of Inchnacardoch has produced a rate of growth equivalent to quality Class II Scots pine.

Of the lesser planted species Abies grandis has been outstanding and as will be seen from Table II has a volume production almost equal to that of Douglas fir. Despite its poorer timber qualities it is a species which, because of its Fomes resistant qualities could be considered for wider scale planting in the event of the disease becoming more widespread.

The larches have grown reasonably well on the drier creep soil sites but tree form, volume production and value are so far below the sites potential that future planting should be confined to the formation of protective belts. The replacement species should be Sitka spruce or Douglas fir according to site conditions.

Amenity is becoming increasingly important in this already scenically beautiful area and the group planting of some of the rarer conifers along public roadsides should be carried out on a small scale not greatly dissimilar to that in existence at present.

As regards the rotation to which the present crops are to be grown profitability assessments made at similar type forests indicate that/

that the optimum rotation is of the order of 55/65 years for Douglas fir, Sitka spruce and *Abies grandis* and rather longer for other species. At 55-65 the average tree will have a B.H.Q.G. of around 12 inches and an average volume in the region of 30-35 hoppus feet.

The prescribed thinning grade in the past has been a C-D grade but this was rarely practised because of fluctuating market demands. With the pulpmill at Corpach taking in its first supplies in 1965 it seems unlikely that the thinning prescription, which will in future be of a crown type, will again be upset for this reason. Regular and timeous thinnings will allow optimum development of the stands and this in turn will have a beneficial effect on the N.D.R. The volume removed at each thinning should not exceed 50% of the C.A.I.

The working plan area has a pulpwood commitment of 110,000 hoppus feet annually and to obtain this it will be necessary to work some 200,000 hoppus feet each year. Based on the C.A.I. for the productive part of the forest it is estimated that this will be wholly obtainable from thinnings. In the event, however, of there being a shortfall in supply this would be made good by removing poor quality European and Japanese larch stands at Port Clair forest. These emergency stands extend to 39 acres with a standing volume of 93,000 hoppus feet and would, if felled, be restocked with Douglas fir or Sitka spruce according to site conditions.

The age class distribution is reasonably good and there appears to be no good reason why this should be altered. Should natural regeneration be a successful means of restocking care will be required to ensure that the most profitable species are allowed to develop freely.

B. General Objects of Management

The Commission's policy is as follows:

- (i) To increase the production of wood as a raw material for industry by extending the area of their forests at a steady rate in accordance with sound land use; and by making each forest as productive as possible.

The working plan forests of Port Clair and Creagannan are largely bounded by Commission forests and apart from acquiring land from Clermoriston Estate which has its own dedication scheme there is little scope for expansion in the immediate vicinity of the area.

- (ii) Within the limits set by their other objectives to manage the forest estate as profitably as possible.

This general object will be pursued by attention to good silviculture. Special attention will be paid to timely thinning and most importantly to the removal of unthrifty crops and their replacement with more productive species.

- (iii) To provide employment in rural areas, especially those most affected by depopulation and in so doing to maintain a skilled labour force.

The forests in the working plan area and the neighbouring forests employ a labour force of around 90 men and the plan prescribes the retention of a steady and well trained labour force.

- (iv) To help in maintaining an efficient home timber trade.

During the period of the plan all of the thinnings will be sold standing to a timber merchant.

(v)/

- (v) To give due attention to the aesthetic and protective roles of the forest and to encourage open air recreation.

The working plan area is situated in one of the most scenic parts of the Great Glen. The forests themselves add greatly to the natural beauty of the locality and no operations which might detract from this will be permitted.

- (vi) To foster industrial and social development ancillary to forestry: by producing substantial quantities of pulpwood the forests forming the working plan area will assist in the development of a major industry at Fort William.
- (vii) To encourage the orderly development of private forestry and specifically to assist in creating conditions which produce from private as well as Commission forests can be marketed to best advantage.

There is comparatively little private forestry in the immediate vicinity of Fort Clair and Creagannach but by supplying produce to the pulpmill at Fort William they will play their part in maintaining an expanding market for small round timber which will be available to forest owners over a much wider area.

Local Objects of Management

a. Short Term

To provide a minimum of 110,000 heppus feet of pulpwood per annum from thinnings. In the event of a shortfall to find the balance from the clear felling of unsatisfactory stands of European and Japanese larch and to replace them with a more productive species.

b. Long Term

1. To produce saw timber of Sitka spruce, Douglas fir and Abies grandis of around 12 inches B.H.Q.S. on a rotation of 55-65 years. The rotation for other species to be decided at a later date.
2. To retain the present even age system of management of the forest.
3. To work towards a sustained yield and thereby create steady employment and a regular flow of timber to the market.

Chapter 26 - SUMMARY OF PRESCRIPTIONS FOR ACHIEVING THE OBJECTS OF MANAGEMENT

(a) Amenity

Timber operations along public roadsides and forest walks will receive special attention. When replanting, groups of the less common conifers will be planted on selected sites on a scale similar to that in existence at present. Clear felling will be avoided along the main Inverness-Fort William road and some form of group selection system will be attempted.

(b) Organisation1. Administration

Port Clair will be staffed by a Forester and an Assistant Forester and Creaghnaneun by a Forester only. Both forests will be under the control of the same District Officer.

2. Management

The working plan area will form one Working Circle but each forest will form one Felling series.

(c) Planting Rate

Of the existing holding of 122 acres of plantable land 60 acres will be planted in F.Y. 64 and the remainder piecemeal because of the scattered location of the areas.

(d) Silvicultural Operations(i) Silvicultural System

The formation of even aged stands will be maintained except for an amenity strip along the public roadside.

(ii) Preparation of Ground

Preparation of ground will be carried out by the most modern and approved methods. No cultivation will be necessary on the steep creep soil slopes but any necessary draining will be carefully planned to avoid erosion. Peat areas will be ploughed where the topography permits.

In the event of the emergency area of larch having to be felled the method of disposal of lop and top will be decided in the year before clear felling takes place.

(iii) Choice of Species

Choice of species will be in accordance with the Objects of Management which prescribes the planting of Douglas fir on the drier rockier creep soil sites and Sitka spruce on the deeper moister sites. Sitka spruce will also be used to stock amorphous flush peats and molinia peats. Pinus contorta will be planted on calluna and erica dominated peats while Japanese larch will continue to be used for fire protection purposes. In the event of damage by Fomes annosus becoming more widespread Abies grandis will then be considered for planting on a greater scale on mineral soil sites.

(iv) Maintenance of Plantations

Conservancy instruction about beating up will be followed. Weeding will be carried out to the extent necessary to allow young plants/

plants to develop normally and close attention will be paid to drains maintenance of peats at high elevation. Brashing of Douglas fir and spruces will continue to be done at around 70% of the crop and up to 60% for other species.

Pruning of suitably sized Scots pine and Douglas fir will be carried out in accordance with S.M. 113. There will be no pruning of spruces and the quality of the larch is so poor that it will be utilised for pulp.

(v) Thinnings

A crown type of thinning will be practised on a five year cycle and the volume to be removed annually will not exceed 50% of the C.A.I.

(vi) Fellings

No clear fellings are proposed within the period of the plan unless there is a shortfall in the pulpwood commitment of 110,000 hoppus feet. In this event the required volume will be found from the 39 acres of unthrifty larch plantations which have been scheduled for this purpose.

(e) Regulation of Yield

The C.A.I. of the Working Plan area is 421,000 hoppus feet and not more than 50% of this will be removed annually in thinnings. Thinnings will be carried out on a five year cycle, the forests having already been divided into five equal-productive blocks for this purpose.

During the period of the plan total yield from the Working Plan area will be in the region of 200,000 hoppus feet annually.

There will be no rotation age felling within the period of the plan.

(f) Roads

Roading intensity will be in accordance with Conservancy instruction and construction as laid down in HM 2a.

In the period F.Y. 64 to F.Y. 70 the mileage of new roads to be constructed will be approximately 6 miles.

The maintenance of roads will be the responsibility of the Forest staff who may call for advice from the Engineering staff when required.

(g) Marketing

At present the thinnings are sold standing under a five year contract which terminates in F.Y. 65. Following on the termination of this, the resident merchant, Peter McAlinsh Limited, Crieff will be offered around 200,000 hoppus feet per annum of which about 60% will be prepared for consignment to the pulpmill at Fort William. It is not the intention at present to work any of the timber with Forestry Commission labour. In the event, however, of the timber merchant failing to fulfil his contract the position would have to be reviewed.

(h) Protection

(1) Fences

Fencing liabilities imposed under the various feu charters will continue to receive the necessary attention.

(ii) Animals

Both Red and Roe deer are harmful and will be kept in control by shooting: the selective method of control will be practised when dealing with Roe deer.

(iii) Insects

Insects have not been particularly harmful but attention will require to be paid to weevil control when planting second rotation crops.

(iv) Fungi

The most harmful fungi has been Fomes annosus and in order to contain it stumps will be treated with creosote immediately after felling or by other approved methods.

(i) Staff and Labour(i) Staff

The present staff of two Foresters and one Assistant Forester is adequate for the period of the plan.

(ii) Labour

The present labour strength is adequate and as all produce work is being undertaken by the timber trade no foreseeable increase is required for forest maintenance purposes. In the event, however, of the timber having to be worked by the Forestry Commission a further twenty men would have to be recruited.

(j) HousingForesters' Houses

Two new Foresters' houses were built and occupied in F.Y. 64 and there are no other requirements at present.

Industrial Workers

The building of workers' houses is not envisaged.