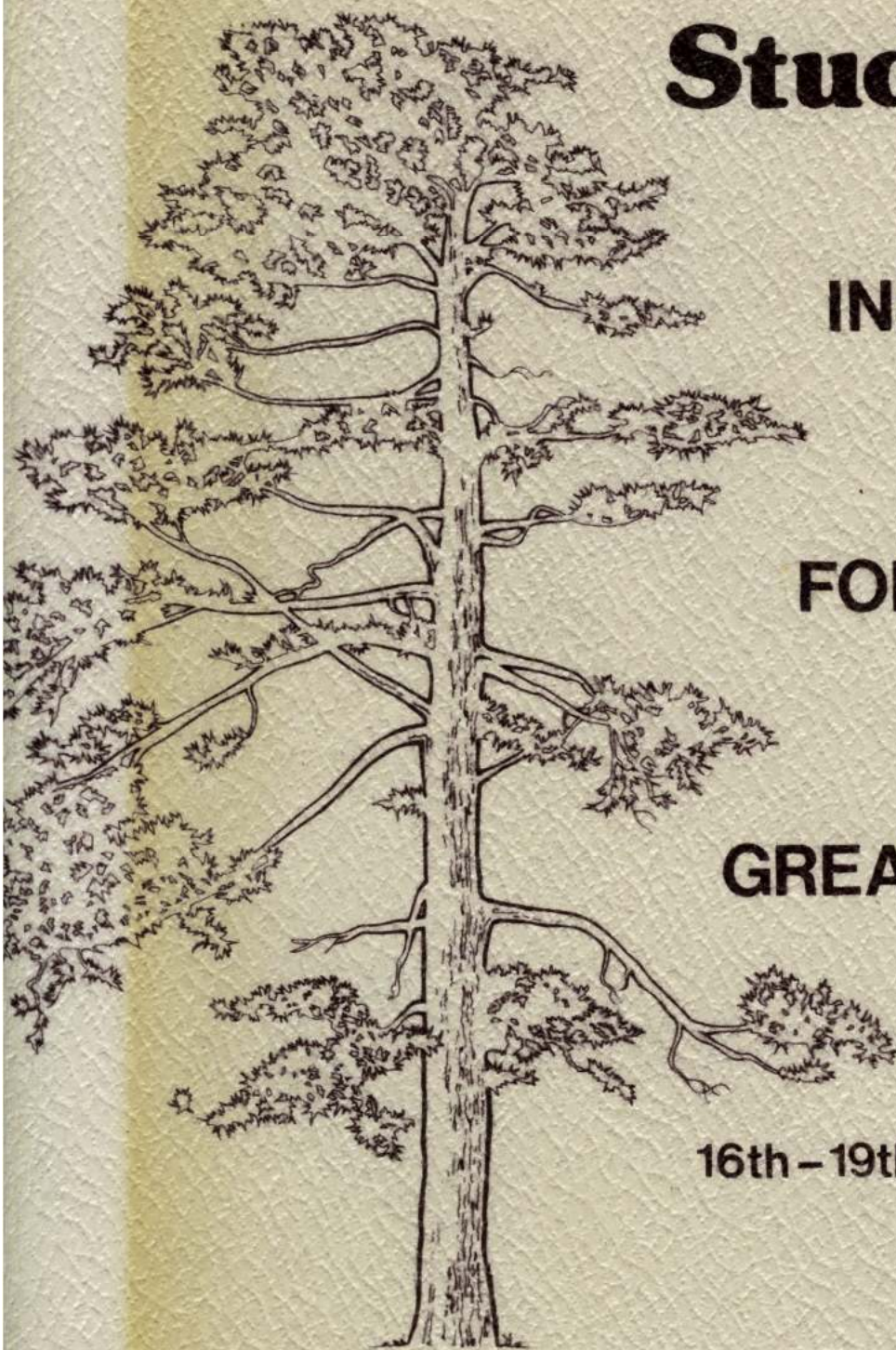


North and East Scotland Conservancies

Study Tour

**INSTITUTE
of
FORESTERS
of
GREAT BRITAIN**

16th – 19th September 1980



INSTITUTE OF FORESTERS



OF
GREAT BRITAIN

STUDY TOUR PROGRAMME

Page

- DAY 1 Tuesday 16th
Evening. Assemble Drumossie Hotel.
Address by Mr R G Cathie,
Conservator N(S).
Illustrated talk by Mr G A Dey.
- DAY 2 Wednesday 17th. Leader J Atterson, Esq 3
Morning: Craigellachie Forest, East(S)
Afternoon: Dallas Moor, Shians Estate
Evening: Guest Dinner
Address by Sir David Montgomery,
Chairman of the Forestry Commission
- DAY 3 Thursday 18th. Leader J Evans, Esq 15
Morning: Glenurquhart Forest North (S)
Afternoon: Affric Forest North (S)
Evening: Free
- DAY 4 Friday 19th. Leader J Voysey, Esq 28
Morning and Lethen Estate
Afternoon:
(concluding at 1500 hours)

Representatives from the Nature Conservancy
Council and from the Red Deer Commission
will join the study tour at Affric Forest.

CRAIGELLACHIE FORESTFORESTRY COMMISSIONSTAFF

Conservator E(S)
Assistant Conservator
Forest Management
District Officer Moray
Chief Forester Craigellachie
Forester Craigellachie

Mr I A D Grant
Mr D B Paterson
Mr A H A Scott
Mr R B Thomson
Mr A Gordon

AREA STATEMENT AS AT 31 MARCH 1980

Plantation	4616 ha
To be planted	697 ha
Agriculture and other	313 ha
Total	<u>5626 ha</u>

CURRENT PROGRAMMES

Annual planting programme	107 ha
Annual restocking programme	5 ha
Annual timber production programme	4000 m ³

THE FOREST AREA

Statistics for Craigellachie Forest are set out below. It is probably right to say that activities at this forest have had a strong bearing on the steady transfer of the Moray foothills from grouse moor to forestry.

Craigellachie is made up of numbers of separate woodlands on either side of the River Spey from the Highland Region boundary at Dalnapot to the Boat o'Brig some 15 miles downstream. It is intermingled with privately owned woodlands,

particularly the Knockando, Carron, Eagle Star (Rothes) and Arndilly Estates. Speymouth Forest, including Teindland, lies downstream (but this is also, approximately, the ORS boundary). Upstream the principal woodland estates are Seafield, Ballindalloch and Tulchan.

An impression of the administrative history of the forest is gained from this list of major acquisitions:-

Date	Property	Ha	Acquired From
1928	Dalnapot, Scootmore	331	G Macpherson Grant
1941	Auchlunkart (Rosarie)	1269	Lt Col G A Stewart Gordon
1954	Wester Elchies (Pt)	1703	A E Higham
1954	Delfur (Pt)	604	Rt Hon N D G Grant
1956	Arndilly (Pt)	433	Lt Col R Stuart- Menzies
1977	Arndilly (Pt)	427	Hon A G Samuel
1979	Glenfiddich (Pt)	359	Mrs B N Morton

GEOLOGY AND SOILS

From the west to east solid geology changes as follows: (a) Moine psammite (Scootmore), (b) Ben Rinnes granite (Elchies), (c) Dalradian quartzite (Ben Aigen, Knockmore, other smaller round topped hills), (d) Dalradian quartz-mica schist (lower slopes of above), (e) Black schists (smaller eastern blocks).

Till covers all the forest except ridges and hilltops. Depth is variable but 1 - 1.5 m is characteristic. Composition and origin are complex although the main rock types involved can often be recognised. The vivid red of the drift on the steep north face of Ben Aigen is probably straining from the ORS previously overlying the schists. Typically, till is stony, coarse to fine sandy loam in texture, and often indurated. Solifluction has had an important influence on soil development.

Except for the new acquisition of Glenfiddich, the forest soils have been fully surveyed with this result:-

49%	Podzols and Ironpan soils	-	Upper slopes
29%	Gleys and Flushed Peats	-	Middle and Lower slopes
16%	Unflushed Peats	-	Mainly Elchies
6%	Brown Earths	-	Scattered

CLIMATE

The forest is about equally divided, by elevation, into two of Birse and Robertson's classifications.

LM. Fairly warm, moist lowland and foothill categorised by 1100-1375 day degrees centigrade and 25-50 mm Potential Water Deficit.

MR. Cool, rather wet, lowland foothill and upland categorised by 825-1100 day degrees C and a PWD of 0-25 mm.

The climate is a very favourable one to the development of heathland which is artificially maintained outside the forest.

WORKFORCE

The current man year requirement at Craigellachie is 9. This is provided by a small permanent squad, mobile ploughmen and by some exchange of labour with the adjacent forests, Glenlivet, Speymouth and Laigh of Moray.

ESTABLISHMENT

Craigellachie Forest covers a span of 50 years in afforestation practice.

Scootmore section is characteristic of early techniques which employed mattock and notch planting on freely drained soils using SP, EL and DF, and turf planting of NS and SS on gley soils. No phosphate was applied.

After 1956, (Elchies is a type example) spaced cultivation using a tine or draining body of trailed ploughs as appropriate became the standard technique with hydraulically mounted tine on old woodland sites. The proportion of spruce was increased, often in mixture with pines. Different progenies of Lodgepole were employed. After 1956 phosphate was always applied to spruce planted on ironpan soils and peats. Poor peats were phosphated except for the period 1963-66 when it was thought that phosphate was causing the instability of Lodgepole pine.

Since 1970 maintenance of existing plantations has involved mainly the application of P, (PK on deep peats) and the control of heather by 2,4-D by knapsack sprayer or the application of nitrogen from the air.

During the period there has developed a marked separation between complete cultivation and the planting of SS pure on heathland soils, and spaced ploughing with LP (Skeena) on moorland peats. Application of fertilisers has moved on to a more systematic basis. Burning before ploughing is regarded as essential on all but the shortest heather. 2,4-D correctly applied is meanwhile the cheapest and most reliable method of heather control.

This heathland technique appears to be successful on schistose soils. More doubts remain about its validity on quartzite soils, particularly if anything hinders the timely application of subsequent nutrition.

AGE CLASS AND SPECIES DISTRIBUTION

The age class distribution to 1971-75 is:-

	1971	1961	1951	1941	1931	1921	1901	Pre	
	-75	-70	-60	-50	-40	-30	-20	1900	Total
ha	76	1272	1750	527	202	78	59	19	3983
%	2	32	44	13	5	2	2	-	100

The percentage by species and Yield Classes of the current growing stock is given below.

	Weighted YC
29% Scots pine	7
29% Lodgepole pine	7
23% Sitka spruce	10
11% Norway spruce	9
7% Larches	4
1% Other conifers and broadleaves	-

PROTECTION

Two Rangers are employed to cover Craigellachie and part of Speymouth. They must do some work on rabbits and hares but the main control required is of roe. Currently cull is about 110 does and 70 bucks, of which 45 are shot on day licence.

An infestation of Pine Beauty (*Panolis flammea*) required treatment with fenitrothion of 770 ha LP at Elchies in 1979 by ULV aerial application.

Fire risk is comparatively low. 26 ha plantations were burnt in July 1976 in a conspicuous part of the hill opposite Craigellachie (and our lunch stop).

HARVESTING AND MARKETING

The harvesting programme is 4 - 5000 cu m annually and, like everywhere else will increase dramatically over the next two decades. Until this year all has been sold standing.

Standing sales have mainly been worked by horse and small winch skidders. A variety of first thinning patterns have been tried, mainly systematic. One row in three removal was successful while equipment could be worked in a single line.

This year 2.5 thous cu m of the Craigellachie cut is being worked by Speymouth forest using a Kockums thinning processor and Bruunett forwarder. The pattern is 4m wide rackways at 16m centres plus 1 in 3 removal between chevrons. Removal is more than 50% of the standing volume. Output is 8-10 cu m per working hour. The work will be visible from the coach.

RECREATION

There is no formal provision for visitors within the forest. A long distance footpath from Spey Bay to Aviemore - the Grampian Way - is nearing completion. This will use the forestry hill road from Arndilly to Boat o'Brig on the right bank of the Spey.

PROGRAMME

Subject: Heathland Afforestation

Arrive Rosarie 1045 (1030?)

Stop 1 Roadside by 'buses.

General introduction to region and subject.

Notes

Stop 2 Rosarie 2 P70.

Results of experiment - Nutrition of LP and SS

a) Outside experiment

b) Walk within and summary.

Notes

Stop 3 Hill above experiment.

Current Conservancy practice.

SS on complete ploughing.

Notes

1300 - 1415 - Travel and Lunch at Craigellachie
Bridge.

Arrive Elchies 1415.

Stop 4 Elchies 1 P57.

Summary from coach.

Walk to hill top for viewpoint.

Historic silviculture of 15 years ago (LP, SP, SS).

Notes

DALLAS MOOR, SHIANS ESTATE

Mrs Carol Kroch-Rhoddes

STAFF

MANAGERS: Fountain Forestry Limited

AREA STATEMENT

Total dedicated area - 1,019 hectares
Total area planted - 652.8 hectares

Virtually all the area is Lodgepole Pine, with occasional admixture of Larch, Scots pine, Sitka spruce, Silver firs and Ornamentals.

CURRENT PROGRAMMES

Annual planting programme 60 ha
Annual timber production Nil

THE FOREST AREA

The altitude range for the estate is from 240 metres to 360 metres above sea-level the most sheltered areas qualifying as moderately exposed with the bulk of the area classed as very to severely exposed.

GEOLOGY AND SOILS

Virtually the entire area is covered by peat ranging from 30 cm to well over 2 metres. This overlies glacial drift featuring podzols and gleyed sandy intergrades. Ironpans are not strong and induration is very variable. In places the parent rock is exposed.

CLIMATE

Cool, rather wet upland falling in Birse and Robertson's MR category.

WORKFORCE

The local full-time staff consist of 1 forester and 3 labourers, supplemented by casual labour as required.

ESTABLISHMENT

Planting began with 43 hectares in 1974 and D.D.M.B. ploughing has been standard procedure since 1975. The improvement in growth over traditional single furrow techniques will be demonstrated during the visit.

First choice of provenance was Skeena, but several areas of South Coastal are in evidence from periods when supplies of the preferred variety were scarce, mainly on most sheltered sites. The future choice of lodgepole provenances based on current knowledge and thinking will be Terrace for the bulk of the area, plus Tofino if it is available and Alaskan Hollis provenances for the more exposed hill tops and forest margins.

All areas receive 375 kilogrammes of unground rock phosphate per hectare at the time of planting, and further applications of fertiliser are expected.

AGE CLASS AND SPECIES DISTRIBUTION

Age Class	71/75	76/80
%	41	59

Species	%
Lodgepole pine	94
Sitka spruce	4
Japanese larch	1
Other	1

PROTECTION

Fire risk is relatively low.

Pupal counts for pine beauty moth are now standard procedure.

HARVESTING AND MARKETING

We now consider a "no thinning" regime to be the most attractive silviculturally and economically, and careful thought will be given on the next planting to the possibility of reducing the tree stocking from 2300 per hectare to 2000 per hectare, taking advantage of savings in costs and increasing the size of the final crop trees.

PROGRAMME

Arrive Dallas Moor 1515.

The main purpose of the visit is to demonstrate cultivation techniques based on research and field experience to achieve a compromise between the conflicting demands of maximum yield, stability and economic return.

Stop 1 Double mouldboard cultivation with LP.

Notes

Stop 2 As above with LP and SS

Notes

Stop 3 General discussion and teabreak.

Notes

Finish 1700.

Arrive Inverness 1830.

GLENURQUHART FORESTFORESTRY COMMISSIONSTAFF

District Officer	T C Booth
Chief Forester	D R Smith
Head Forester	M Rodgers
Forester	J W Chree

AREA STATEMENT AS AT 31 MARCH 1980

Plantation	5016 ha
Retained Scrub	107 ha
To be planted	517 ha
Agriculture and other	4830 ha
<u>Total</u>	<u>10470 ha</u>

CURRENT PROGRAMMES

New Planting	25 ha	
Restock	30 ha	
Harvesting	Total	14400 m ³
	(Pulp)	3300 m ³
	(Logs)	11100 m ³
	(Thin)	4200 m ³
	(Clear)	10200 m ³
	(fell)	

THE FOREST AREA

Glenurquhart Forest is made up of the former Boblainy, Battan, Reelig and Glenurquhart Forests. The main, and older, block lies in the valley sides of the River Enrick in Glenurquhart and extends from Drumnadrochit to Corriemoney, a distance of eight miles.

GEOLOGY AND SOILS

The Forest lies to the north of the Great Glen fault and the underlying rocks are mainly metamorphic schists

of the Moine series. There are small areas of Middle Old Red Sandstone near Lewiston on Loch Ness side and to the north, in the old Boblainy section south of Kiltarlity. There has been no soil survey of the forest but the soils can be divided into three basic types. Up to 275 m on the valley sides creep soils, deeply rootable brown earths and pockets of surface water gley where heavier material has been deposited. Above 275 m, podsoles and iron pan soils predominate. Induration and iron pan soils are a feature of the Old Red Sandstone areas. Deep peats form a very small proportion of the soils and are restricted to ground over 300m, in basins between morainic knolls.

CLIMATE

Average rainfall (valley floor) 1070 mm (42"). Relative Humidity is low. Snow fall is generally light. The north facing slope of the main valley suffers from a lack of winter sunshine and can remain frost bound for considerable periods. Birse and Robertson classification for Exposure and frost is "Moderately exposed with moderate winters" for the lower slopes, and "Exposed with rather severe winters" for the upper slopes. For temperature and potential evaporation, the low ground is "Fairly warm moist"; the upper slopes, "Cool rather wet".

WORKFORCE

Harvesting	12
Forest Management	7
Clerical	1
Total	<u>20</u>

There is no use of contract labour.

ESTABLISHMENT

The 15% of the forest planted before 1950 was mainly on the richer lower slopes, hand preparation was minimal and a high proportion of planting was direct notch. These sites have never needed additional fertiliser but have called for intensive weeding.

Large planting programmes in the 1950's (50% of the forest was planted in one decade) coincided with the introduction of improved ploughing techniques developed on the dry eastern heaths, first with trailed tine, ploughs and later with mounted tine ploughs which proved advantageous on broken ground. This was somewhat fortuitous as the ground available largely required the breaking up of iron pan or indurated layers. Any large peat flats were ploughed with a single mould board Cuthbertson plough. Application of "P" at planting became standard on these poorer soil types, in recent years this has been applied aerially. Heather control has only been required on a minor scale.

AGE CLASS AND SPECIES DISTRIBUTION

The main valley contains the older blocks and is principally DF, SS and NS. More recent plantations on poorer ground and to the north are mainly SP, on podsoils and iron pans; LP on deep peat.

Age class distribution at March 1980

Age Class	Pre 1900	06-10	21-25	26-30	31-35	36-40	41-45
%	1	<1	3	5	6	<1	0

Age Class	46-50	51-55	56-60	61-65	66-70	71-75	76-80
%	2	33	20	17	6	4	3

Species %

Pines	37
Spruce	43
Douglas fir	10
Larch	5
Other	5

PROECTION

Fire: Visitor pressure is not high in the high fire danger season and the bulk of the forest is in a well populated area so that fires are soon reported.

Muir burning creates the greatest fire hazard in the dry spring conditions.

Deer: Roe Deer provide the major source of damage, particularly in the restock areas. Red Deer are present in quite large numbers on the high ground to the south of Glenurquhart.

HARVESTING AND MARKETENG

(All volumes in '000 m³ ob)

	Production Forecast Period	THIN	FELL	TOTAL
Volume to 7 cm-T.D.	77 - 81	4.4	12.1	16.5
	82 - 86	8.0	9.1	17.1
	87 - 91	8.4	10.6	19.0
	92 - 96	10.2	7.5	17.7
Volume to 14 cm T.D.	77 - 81	1.1	11.0	12.1
	82 - 86	0.8	7.8	8.6
	87 - 91	0.7	8.6	9.3
	92 - 96	0.9	4.5	5.4

All working is carried out by FC labour, the current programme involving a high proportion of clear fell with high quality logs of DF and SS. The variable terrain calls for a combination of Cable Crane, Skidder and

Forwarder working methods. Cable Cranes have a full programme for two machines. The Timberjack Skidder is based at Glenurquhart but used for 50% of its time at other units. A Highland Bear clears winches, and does road forwarding and stacking.

RECREATION

As this valley provides a link between the great attractions of Loch Ness and Glen Affric, a considerable amount of time has been spent on the landscaping of the clear fell areas in the older crops.

Reelig Glen, on the outskirts of Inverness, is used regularly throughout the year as a popular Forest Walk.

PROGRAMME

Subject: Harvesting and Restocking

Arrive Glenurquhart 1000

Stop 1 Roadside Kilmartin.

1. General introduction to forest.
Forest statistics. Display maps.
2. Planning of harvesting coupes to include landscaping.

Notes

Stop 2 DF sample plot.

1. Growth of DF (plot as representative of general DF growth on site).
2. Techniques of restocking.
 - a) DF and its regeneration
 - b) Consider other species
 - c) Ploughing.(NB deer control not considered at this forest).

Notes

Stop 3 DF clearfell area.

Harvesting, extraction, conversion techniques.
Planning of clearfelling.
Product mix.

Notes

Stop 4 Display of end products.
Summary.

Notes

Depart 1230 for Glenaffric.

on test

1930

CONFIDENTIAL

STUDY TOUR DAY 3

Thursday 18 September 1980

AFFRIC FOREST

FORESTRY COMMISSION

STAFF

District Officer	F M MacRae
Chief Forester	H D Morris
Head Forester	I P Toulmin-Rothe
Forester	B Stanger

AREA STATEMENT AS AT 31 MARCH 1980

Plantation	7043 ha
To be planted	777 ha
Agriculture and Other	20923 ha
Total all Land	<u>28743 ha</u>

CURRENT PROGRAMMES

Annual planting programme	120 ha
Annual restocking programme	Nil
Annual timber production programme	3000 m ³

THE FOREST AREA

Affric Forest occupies parts of Strathglass, Glen Affric and Glen Cannich in central Inverness-shire. The administrative centre is Cannich village, some 43 km west of Inverness.

GEOLOGY AND SOILS

Schists and gneiss of the Moine series form the basic geology. Deeply foliated micaceous schists extend in wide bands in a north/south direction in the Loch Affric area.

The area is comparatively free from glacial drift except at lower levels. Wide alluvial traces occur at Ath na Mullach to the west of Loch Affric and also on the middle reaches of the River Glass.

Soil types are clearly defined and range from small areas of deep and fertile brown earths, to peaty gleys and blanket bog. In general the lower and middle slopes are reasonably fertile, there is much deep peat on the strath floor and the high land is rocky, with constant muirburn and heavy rain contributing to the state of erosion.

CLIMATE

Stretching from Beaully in the east to Kintail in the west over 48 km, the forest is affected by a wide range of climatic conditions. Annual rainfall varies from 890 mm in the east to 2030 mm in the west. Snowfall can be heavy and prolonged and frost occurs at all seasons and can be severe, down to -20°C . The severe winter of 77/78 produced an ice sheet on Loch Affric some 430 mm (17 inches) in thickness.

The well mixed topography and inland location of the forest results in low exposure levels and presents no serious limitation to tree growth under 500 m.

While summers are generally cool and moist, occasional high temperatures do occur, while the winters are generally sharply cold but still.

WORKFORCE

The workforce, largely based in Cannich village in FC houses, FC hostel and Local Authority houses, totals 23.

Three are full time Rangers, two are Trainee Rangers. A Clerk and Cook are employed, and the balance (16) are Forest Workers. Ten young men reside in the hostel, the last remaining "bothy" in this Conservancy.

ESTABLISHMENT

The earliest plantings in 1934-1940 in the fertile Guisachan section were by direct planting or on hand spread turves, cut from drainage formation. Major expansion came with the acquisitions of Knockfin, Affric, and Cougie estates, from 1951-1967, and the forest has expanded steadily since that time.

Ploughing is standard practice.

AGE CLASS AND SPECIES DISTRIBUTION

The earliest plantings were of Norway Spruce and European Larch on fertile sites, while Scots Pine was used on the remaining soils of lower fertility.

AGE CLASS	Pre 1900	31/35	36/40	41/45	46/50	51/55
%	8	< 1	2	< 1	2	10

56/60	61/65	66/70	71/75	76/80
21	16	13	19	9

Areas of species as % of total crop:

SP	2944	42%
LP	1924	27%
SS	925	13%
NS	473	7%
DF	379	5%
JL	181	3%
EL	125	2%
HL	84	1%
OC	8	0%

The area includes the Native Pinewood estimated at 548 ha fully stocked in a special working circle of 1746 ha.

PROTECTION

Affric is an isolated forest marching with a small number of large private estates or FC controlled sporting tenants.

Nearly all the access roads are "dead ended", and the visitor pressure is low until the month of June.

The above factors indicate a low fire hazard, and to date the incidence of fire outbreak has been minimal.

The forest lies in the heart of the Highland deer forest territory and the pressures upon it are very high. Deer fencing is essential in afforestation and restocking. While Roe deer are numerous and destructive the greatest threat is from Red Deer. Damage also occurs from blackgame and capercailzie.

Deer populations are controlled by three permanent Rangers, aided by two trainees.

The forest is a training centre of North Scotland Rangers.

HARVESTING & MARKETING

The harvesting programme of $3000 \text{ m}^3/\text{annum}$ is confined to the spruces and larch of the Guisachan section and pulpwood is the end product.

Small sales (500 m^3) of select sawlogs come from acquired stands of Douglas Fir in the Plodda area, where the outstanding crop of YC 24 is being thinned with great care - partly to aid natural regeneration - but partly to keep intact this show piece stand of trees with individual volumes of 12 m^3 . They are site potential indicators of considerable importance.

All extraction is by ground skidder or forwarder, and recent improvements in light forwarders indicate that considerable areas which are due to be thinned in the 1990 period will in fact be forwarded. In future working, skyline extraction will be minimal.

RECREATION

Affric has considerable recreational potential and with its twin glen of Strathfarrar the vast area of mountain, forest, and loch, has long been considered suitable as a National Park.

Forest walks, fishing, stalking, hill walking and the study of the Native Pinewoods are some of the more important elements.

With its "dead end" roads giving access to unspoiled country, the area must rank highly in the "wilderness" scene, the retention of which is so important in the European setting.

PROGRAMME

Arrive 1315 Glenaffric Picnic Site.

1315. - 1345 - Lunch

Glenaffric Subject: Management of Natural Pine Forests and Red Deer.

Stop 1 Picnic Site.

General introduction to forest. Forest statistics. Display maps.

General introduction to subject.

Draw attention to natural regeneration on opposite side of loch.

Notes

Stop 2 Knowe overlooking Loch Affric.

1. Commercial afforestation in natural pine woods.
2. Deer management.

Notes

Stop 3 3rd NR Pine enclosure.

Management of natural pinewoods with objective of establishing a young age class.
(Short walk through woods to examine site variation).

Notes

Join 'buses at Cannich by 1700 to Inverness by 1800.

STUDY TOUR DAY 4Friday 19 September 1980LETHEN ESTATELETHEN ESTATE TRUSTEESMrs D J BrodieMr Ewen BrodieSTAFF

Head Forester

Mr Ian Mathieson

Head Forester (Retd.)

Mr James T Logie

Timber Merchant

Mr Ronald Gordon

John Gordon & Sons, Nairn

AREA STATEMENT

Dedicated Woodland	1078 ha
Other woodland	30 ha
Tenanted arable farms	1202 ha
Rough grazing/birch	930 ha
Moorland grazing/sporting	2792 ha

CURRENT PROGRAMMES

Annual Planting Programme	Nil
To be planted	Nil
Restocking programme	5 ha

There are tentative plans for further new planting on part of the tenanted rough grazing/birch land extending to 930 ha, which is of low agricultural value.

THE FOREST AREA

The estate has belonged to the Brodie family for over 330 years, and there is evidence that forestry has been practiced for some considerable time and the majority of the woodlands are at least 2nd rotation crops. They consist of a number of large and smaller blocks scattered throughout the estate at elevations ranging from 60 to 240 metres. Aspect is generally northerly and slopes are gentle. Exposure is slight to moderate.

GEOLOGY AND SOILS

The northern, and lower, parts of the estate lie on the sandstones flagstones and shales of the middle old red sandstone while the southern section lies on granulites and schists of the moinian assemblage and on intrusive granites.

The pattern of soils is complex but consists mainly of glacial outwash sands and gravels derived from the old red sandstone. Some areas have brown earths but the soil types are mainly podsollic with an occasional compacted layer. In some areas there is an indurated layer.

CLIMATE

The climate is mild, with a relatively low rainfall of 660 mm average per year.

ESTABLISHMENT

Planting was carried out without the benefit of site preparation until recently.

AGE CLASS AND SPECIES DISTRIBUTION

Scots pine predominates with a high proportion of the woods in the post war plantations.

AGE CLASS	01/20	21/30	31/40	41/50	51/60	61/70	71/80	Total
Ha	16	165	46	167	304	254	113	1060
%	1	16	4	16	28	24	11	100

SPECIES	SP	LP	SS	NS	Larches	DF	MC	Hwds
%	78	2	4	3	4	3	2	4

PROTECTION

Fire danger is moderate and high risk localities are kept clear of inflammable material. No picnicking is permitted near woodlands.

Muirburning is carried out regularly by the estate staff.

Peridermium pini is reaching serious proportions which may necessitate early felling of mature stands.

HARVESTING AND MARKETING

The majority of the Scots pine stands are in General Yield Class 10 when the age of 1st thinning according to the Management Tables is 25 years.

The area of woodland currently in the thinning stage is 550 ha.

The production forecast for Lethen Estate, based on thinning to maximum intensity and an optimum felling age of 60 years is tabled below.

Average Annual Thinning and Felling Yields m³ OB

	Forecast period	Thinning Vol.	Felling Vol.	Total Vol.
Vol to 7 cm TD	1980-84	2500	3600	6100
	1985-89	3100	2800	5900
	1990-94	3700	1200	4900
	1995-2000	4300	1300	5600
Vol to 18 cm TD	1980-84	300	3000	3300
	1985-89	300	2400	2700
	1990-94	500	900	1400
	1995-2000	800	1100	1900

The timing and extent of clear fellings however are decided by the owners according to estate management

policy and buoyancy of markets. The annual production for the next five years is planned to be:

	2500 m ³	millwood
	2000 m ³	small roundwood
Total	<u>4500 m³</u>	

Harvesting and marketing are arranged by John Gordon and Sons, Timber Merchants, Nairn, who have a long term marketing agreement with the owners and other adjoining estates in Nairnshire.

PROGRAMME

Subject: Management and Silviculture of SP on the Moray Firth.

Arrive 1000

Stop 1 Estate Office (hall if wet).
General introduction.

Notes

Stop 2 Beech: Cpt 14.
1. Treatment of SP at mid rotation age.
2. Treatment of low grade Be.

Notes

Stop 3 Cpts 826/7

1. SP thinning techniques (sawlog production).
2. Restocking: change of species (SS nearby).
3. Pole stage fertilising.
4. Pathogens: P pini, Fomes.
5. Marketing Co-operative.

Notes

1230 - 1315 - Lunch (at Loch).

Stop 4 1315 Cpts 556/560/561

1st thinning of SP and SP/SS (Thinning techniques, should SS be favoured?).

Notes

Stop 5 Lethen Bar
Afforestation of scrub heathland.
Possible other agricultural uses.

Notes

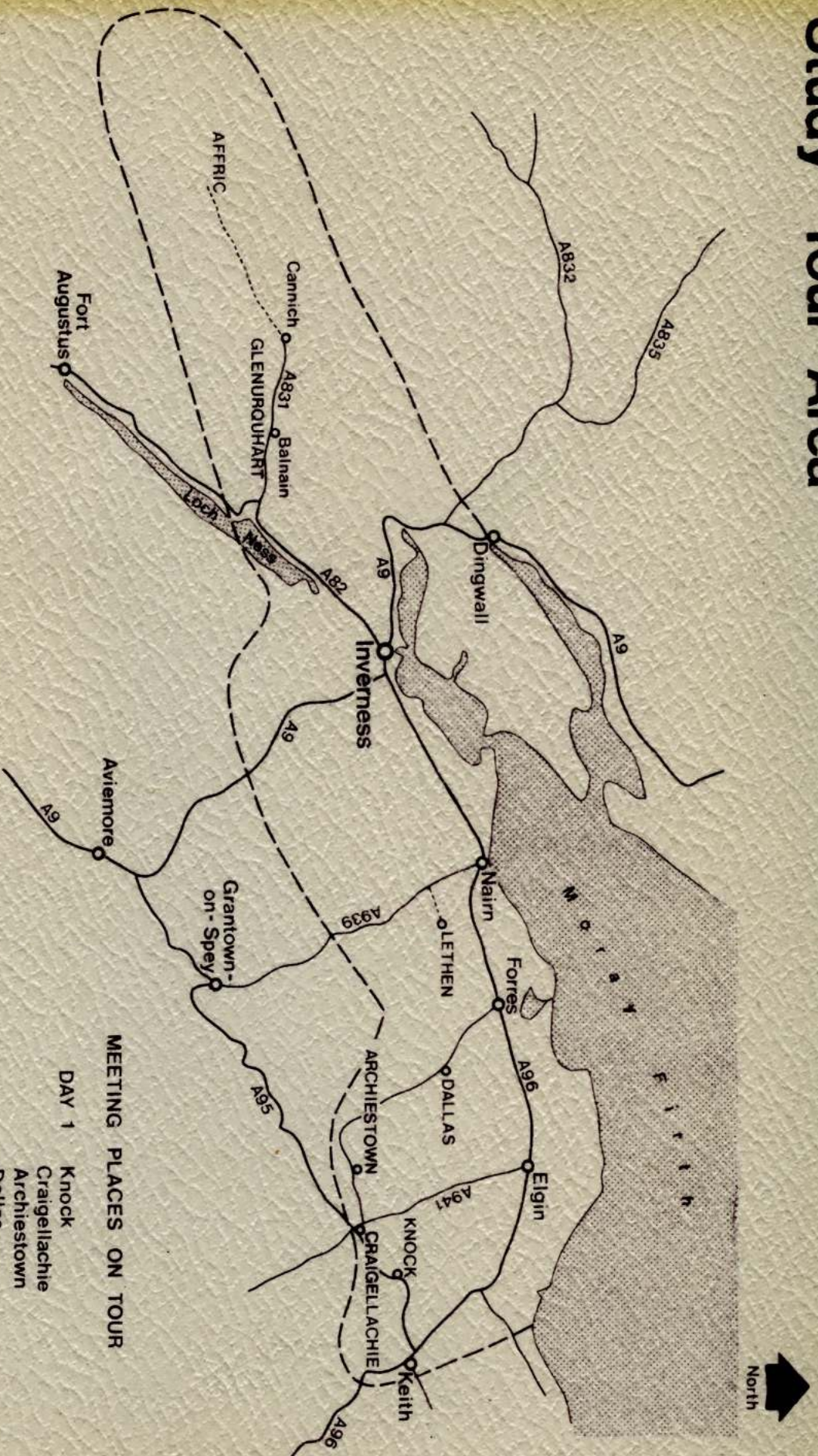
Finish 1500

INSTITUTE OF FORESTERS



OF
GREAT BRITAIN

Study Tour Area



SCALE : Approximately 12 miles (19 km) to 1 inch (2.5 cm)