Society Activities

37th ANNUAL STUDY TOUR, 1979

SCOTLAND

Monday, 14th May, 1979.

The 1979 annual study tour was based in the Scotlands Hotel, Pitlochry, Scotland.

The first stop of the tour was at Dunkeld Stanley Hill car park. Here our President, Mr. F. Mulloy, formally introduced the tour leader Mr. Gunnar Godwin, chairman of the Angus and Perth Region of the Royal Scottish Forestry Society, who welcomed the party to Scotland. Other members of the Royal Scottish Society to greet us here were, Mr. Chris Langton, Forestry Manager on the Duke of Atholl's Estate, Mr. F. J. Donald, Forestry Commission, Mr. D. F. D. Black, Chief Forester, Dunkeld Forest and Mr. T. W. MacMillan, Head Forester, Dunkeld Forest.

Mr. T. W. MacMillan outlined briefly the history of Dunkeld Forest, part of which was acquired from the Atholl Estates in 1937. Atholl Estates are famous for the extensive planting of larch in the 18th, 19th and early 20th centuries. In 1750, some 350 European larch trees were planted here on kennel bank of which there are still 16 survivors. About 1887 Japanese larch was planted near the 1750 planting and the first hybrid collected from the Japanese mother trees was observed in the early 1900's and became known as the Dunkeld Hybrid Larch (see E. C. Nelson's paper in this issue, pp. 112-118). In 1964 the kennel bank was acquired by the Forestry Commission so that the 'parent larches' could be managed as part of the history of tree breeding in Scotland.

From the car park we were led to the renowned kennel bank, a walk of about half a mile along the Estate avenue. Here we observed some of the remaining survivors of the 1750 planting of European larch. These trees are huge, the largest having a volume of 17.3 cubic metres with a top height of 35.9m. They are on a steeply sloping fertile site.

Mr. MacMillan stated that the bulk of their larch seed now comes from seed orchards and there is still a modest demand for hybrid larch. Originally it was intended larch would supersede oak for shipbuilding. Only the first generation hybrids give good seed. Frost was not a serious problem on the slopes but severe frosts did occur along valley bottoms. Relative to Douglas fir and Scots pine, Japanese larch suffered least damage from wet snow-storms. *Fomes annosus* is not known to have occurred on the kennel bank.

Today, in line with Forestry Commission policy, particularly in areas of high scenic value, larch plays a mostly non-commercial role. 10%-15% of all planting in these areas is designated for landscaping. Larch provides no serious difficulties with establishment, although mountain hares are a problem. Deer affect Douglas fir and *Abies grandis* to a greater extent than the larch. The average YC for hybrid larch in Dunkeld Forest is about 12.

From here the party moved back along the avenue to the car park, leaving as we went on the right, Dunkeld Cathedral. Built in 1689, it is now held by the National Trust for Scotland and currently being renovated. The stately building was partly

sheltered from our view by a large lone European larch tree 250 years old, which looked more like an oak tree in form than a conifer and still showed great vigour for its years. The party then boarded the coach and set off for the next stop at Fresh Water Fisheries Laboratory, Faskally, near Pitlochry.

The drive to Faskally took in some breathtakingly beautiful views of the Tay river valley, with its splendidly wooded slopes and its broad meandering waters.

At Faskally we were introduced by Mr. Chris Langton to Mr. B. Morrison, Senior Scientific Officer at the laboratory. We were shown to the meeting room where Mr. Morrison gave a most interesting talk with the aid of slides on the work being done at the laboratory.

The Centre was set up in 1948 to investigate the brown trout and study methods of improving the stocks for exploration by anglers. Today the study of salmon is the main priority of the laboratory.

Conifer forest-rivers have a pH of less than 5 with little bottom fauna. Where forests were older the pH was found to drop and increased almost immediately outside the forest. Their research showed no May-flies were found in streams within the conifer forest, and eggs planted in forested streams died off quickly. Studies into the effects of nutrients, mainly phosphorus and nitrogen entering streams from aerial fertilisation of forestry plantations are being made. Spraying of forest areas with certain insecticides, DDT and dieldrin have been found to adversely affect fish populations in adjacent rivers. Tests have shown the temperature of water in rivers of forested areas to be lower than that in rivers of non-forested areas.

Concluding, our President, Mr. F. Mulloy, thanked Mr. B. Morrison and the party again boarded the coach.

From Fascally we travelled to Blair Castle, the home of the Duke of Atholl. Here we were treated to lunch in the castle restaurant.

Pat Doolan.

Monday 14th, May — Afternoon — Blair Castle, Atholl Estate.

Having enjoyed a pleasant lunch most of the group had a brief look at the varied and wide collection in the main hall of the castle.

Under the leadership of Mr. C. Langton the afternoon tour formally started with a visit to Diana's Grove, a magnificent arboretum of fully grown conifers situated adjacent to the castle. Its area is two acres and most of its present stand was planted in 1872. It contains 19 trees more than 150ft tall and 9 trees more than 160ft. There are 62 trees of six different species 130ft tall and above. It is unlikely that any other two acres in the world contains such a number of different conifers of such heights and of such small age. The two largest trees seen were grand fir 178ft tall, 14ft 8ins B.H. girth.

From the grove the group proceeded on a long walk up the mountainside to the peak at 1500ft. On the ascent we saw and discussed private forestry on a large scale, deer management with their associated problems for forestry. The larches and Scots pine species were the typical woods. Modern policy is to reduce the area under larch in favour of higher producing conifers such as spruce. Hybrid is the major species of the larches, and where retained will be confined to the shallow soils and highelevated exposed sites. Windblow, windbreakage and harvesting methods seemed similar to our own. While deer graze the open forest of the estate, sheep grazing is carried on where possible.

Re-planting caused enormous problems as the soils while reasonably fertile are very free draining and suffer from a long dry spell annually in April and May causing high rate of failures. Red deer also add a major problem to re-planting, making it necessary to retain a large boundary fence at a high cost. Heavy snows which occur

annually drift and bank up against the large fence. After slight thawing, the snow forms a crust hard enough to enable the deer to walk over it into the forest.

Red deer are very numerous and must be restricted to outside, while roe and fallow deer can be tolerated within the young plantation.

At a further point along the walk we were able to see bare ground which once carried high forest, but was blown and deer have prevented re-establishment.

There is over 500 years tradition of hunting deer on the estate, and it is a major financial concern today. Deer were seen on a number of occasions this evening and one herd had up to 100 in number.

The outdoor session of the first day of the tour concluded with a refreshing return journey downhill to the castle lawn where our President thanked our hosts for an exciting and entertaining day.

J. Kilbride.

Tuesday 15th May - Morning - Forest Rannock.

Mr. F. Donald introduced our party to the local staff of Mr. P. J. Garrow, Chief Forester, J. A. Parker, Head Forester, and C. Marshall, Forester (under training) and went on to outline the layout of Old Barrack's section of the forest which is a new planting area of approximately 1500ha planted since 1961 mainly with Sitka spruce and lodgepole pine. The limiting factors of the site were the poor soil and the 1000ft elevation. The Sitka spruce was planted mainly on the flushed peats and the lodgepole pine on the drier poore sites.

Ground preparation was by tine and turf ploughing. Planting is carried out from March to the end of June at a spacing of 2m x 2m. An initial dressing of P and K at Rate of 375kg/ha is applied, but it is expected that further dressings will be required throughout the rotation to prevent check. Some questioned the need for K in the initial dressing but the view was put forward that K helped in winter hardiness of plants.

It was believed that Sitka spruce had been pushed too far on this whole area at the early stages and perhaps the choice of a low input and low output lodgepole pine would have been better.

The main provenances of lodgepole pine used were N. Coastal Skeena and some inland which was found more susceptible to deer damage. In discussion Mr. R. Lines believed that in time a provenance to suit each site type would have to be selected to make he optimum use of site potential.

A very real problem existed in establishing forestry in this area which was the presence of about 300 red deer in the confines of the forest with many more outside the perimeter fence.

A survey showed 46% of all trees in this part of the forest were damaged to some degree, with lodgepole pine being mostly affected especially in the early stages of growth. Damage to Sitka spruce by stripping seemed to occur much later at about 20 years of age of the crop.

Management of crop was to be a no-thinning regime with the object to get a final crop in the shortest rotation possible. Cost of roading was a major factor in deciding on this regime. However due to the sizeable windblow caused by the deer damage it was felt by some that the deer were doing the thinning anyhow.

Discussion centred on the profitability of planting such land for a return possibly as low as 1% in real terms. However it was expressed by some that with the high rate of inflation and low return on investment currently it may not be such a low return as first appeared. Control of deer numbers within the area was discussed, when it was learned that it required the services of four rangers to keep deer populations in hand involving an annual culling of 220 red deer and 130 roe deer. In new planting, glades for deer were left along banks of streams for ease of management.

Tuesday, 15th May — Afternoon.

After an enjoyable lunch the Society was shown an area of Barracks Section planted in 1961 with 3 different provenances of lodgepole pine. Mr. R. Lions informed us that the provenances used were:

1. Sooke — which originated from the southern tip of Vancouver Island. This provenance is similar to that of Lulu Island but is more vigorous than the latter. It is not a fast frowing provenance but it shows little basal sweep. Unfortunately it suffers from wind blast.

2. South Coastal — as its name suggests this provenance originated from the south Washington coast. It is a vigorous provenance with heavy branching — the branches being so dense that the main stem is obscured. Its bark is very rough so it is more resistant to deer stripping.

3. *Inland* — this provenance originated from the interior of Washington, British Columbia and Oregon. It is a finely branched provenance with the branches being divided into secondary and tertiary branchlets. The needle colour of this provenance is light green — tending to yellow if unfertilised. the bark is thin, thus making it susceptible to deer damage.

In the discussion that followed it was ascertained that fertilisation was considered economically justified at costs of \pounds 29- \pounds 40 per ha when yield classes of 9 to 10 were expected on the site. High pruning was not considered to be an economic proposition on lodgepole pine and was only considered justifiable on high yielding crops of Douglas fir and Scots pine.

As there was considerable evidence of bark stripping caused by deer in the three compartments of lodgepole pine, the discussion than centred around deer damage and control. Mr. Phill Radcliffe of Forestry Commission red deer research programme spoke of the changing population dynamics of the red deer which is occurring as a result of the increased shelter and feeding available to the animals in the plantations as opposed to those of the open hills. In Rannoch Forest the deer are increasing at a rate of 20% to 25% each year and consequently increased culling is necessary. To facilitate this it was found necessary to provide deer lawns of $\frac{1}{2}$ ha in size, numbering 5 per 100ha, i.e. 2-3% of the total planted area. The red deer density in Rannoch Forest is approximately 15 to 20 per 100ha.

The bark stripping caused by the deer during the winter and spring months can cause degrade in sawlogs, be responsible for windbreak and also allow the entry of butt rot — particularly in Norway and Sitka spruce.

After rejoining the coach at the Bridge of Gaur, the Society then travelled to the Black Wood of Rannoch. Here Mr. J. F. Donald recounted the history of this 100ha of old "Caledonian pines". This natural pine forest was part of the Dall estate which was forfeited to the Crown Conservators after the 1745 rebellion. Limited grazing was allowed during this period with its consequent effect on regeneration. The estate was subsequently returned to its owners and large scale commercial exploitation commenced in 1840 by floating the timber to Dundee by canal. Further exploitation took place during the construction of the Highland railway, a little during the 1914-18 war and a considerable amount of timber was removed during the 1939-45 war by Canadian foresters. The Forestry Commission acquired the wood in 1947 and its importance as a native pinewood was recognised and set aside as a research reserve. An early decision was taken that planting with Scots pine within the Rannoch area was to be limited to Scots pine of Rannoch origin only.

In 1975 the area was designated a Forest Nature Reserve and the Forestry Commission dicided to ensure the conservation of the woodland by trebling the area under forest.

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In the course of a very pleasant walk through the Black Wood the Society was shown the following:

1. An experimental area laid down in 1949 to investigate ground treatment in relation to Scots pine regeneration. In this area Scots pine seed was sown, but only birch and rowan survived because of deer browsing. Also it was shown that the thickness of the Calluna sward and moss impeded the Scots pine regeneration.

2. An additional experimental area where fencing and ground preparation had been carried out. Regeneration was more successful here but the poor form of the parent trees was commented on. The Society was told that this may be phenotypic rather than genotypic particularly where exploitation removed all the good stems and the fact that young stems which resulted from the regeneration were of good form.

3. The final stop was at an abandoned old nursery site and is now heavily stocked with Scots pine and birch. This site is being managed by a policy of non-interference.

The Chairman for the afternoon thanked the leaders and closed the proceedings at he end of a very interesting day.

J. P. Connelly.

Wednesday, 16th May - Morning.

This morning in the lightly falling rain our coach sped through the Dunkeld larchwoods and on through rolling farmland with its crops of grain, potatoes and soft fruit. The towns of Blairgowrie, Kirrimuir and Brechin, we soon left behind to arrive at Drumtochty picnic area of Mearns forest at 11.30 a.m. However, silviculture was not to be our morning discussion point, so we pushed on to Glensaugh Research Centre.

Here, the Hillfarming Research Organisation is carrying out interesting experimental work into the use of upland country for the farming of red deer towards the production of venison. The commercial viability of the project is also being assessed.

The deer farm which is situated at approximately 400m elevation was fenced, reclaimed, fertilised and re-seeded in 1970 and has a herd of stags, hinds (mostly pregnant) and followers for fattening.

All aspects of deer farming from fertility of stags and hinds through rearing and fattening to eventual slaughter are being studied. In conjunction with Baxters, the foal processors, the taste flavour, colour, texture and shelf life of the venison is tested in the market place.

Our visit concluded with a lively discussion on this very realistic approach to deer farming which augurs well for the future of Scottish rural economy.

J. Mannion.

Wednesday, 16th May — Afternoon — East Scotland Conservancy.

Received brief outline of conservancy by Mr. Grant, Conservator at Deer Farm. This conservancy consists of 93,000ha, 30% of which is productive, 230,000m³ of timber are harvested per annum. Of this the 12-18cm range are used for pallet making and the smaller sizes for pulp. The 18cm logs fetch a price of £19.50-£23 per m³. The conservancy is equipped with 10 Forwarders, 19 Skidders and 6 Cable Cranes.

After being introduced to Mr. Cuthbert, the District Officer, we departed from the deer farm and visited Drumtochy car park where we met Mr. D. Elliot, the Head Forester. Close to the car park there is an interesting Sitka spruce which is 156ft high with a girth of 21ft. It was planted in 1831, when the first Sitka spruce species were introduced into Britain.

Then we visited Mearns Forest where harvesting was in operation. This forest is located between Grampian Mountains and agricultural land. The southern block of the forest runs within five miles of the sea. There are 7,000ha in this forest which was acquired by the Commission in 1926, 1943 and the remainder in the 1950's.

The soils are derived from Old Red Sandstone, schists and granite drifts. The main problems in establishment are competition from heather in the early years, and penetration of the iron pan. The fertiliser used is phosphorous. The Yield Class for the rea is 12-14.

After visiting the harvesting site a long discussion took place on harvesting. In extraction a skidder, forwarder sky line and tractor processor are used. $6,000\text{m}^3$ are produced with forest staff, $7,000\text{m}^3$ are sold standing. Price received, £17 per m³ on road. Average volume per pole = 0.4m^3 . The cost of the various operations are as follows:

Forwarder — £1.42 per m³. Skidder — £2.35 per m³. Sky Line — £3.51 per m³. Felling Cost — £1.78 per m³.

Total cost to collection point = $\pounds 12$ per m³. The most of the extraction is done by a Volvo forwarder which delivers $6m^3$ each time. The sky line is only used on the difficult area on top of the hill. Year of planting of harvesting site was 1929.

This harvested area will be re-forested with Sitka spruce. No preparation of ground will take place. No fertiliser will be applied to these re-forestation sites.

On these Old Red Sandstone derived soils there is a rainfall of 30-40 inches. This would be half our rainfall on similar sites. This results in less podsolisation in their soils as less leaching takes place.

This discussion on harvesting costs and podsolisation concluded the afternoon tour.

M. Hennessy.

Thursday, 17th May — Morning.

The Thursday morning visit was to Drommond Hill Forest. Mr. Fred Donald, District Officer, introduced Mr. Gordon McBain, Head Forester.

The plantations here, overlooking picturesque Lough Tay, were among the earliest Forestry Commission acquisitions. Some acquisitions dated back to 1914. However, the bulk of plantations dated from 1922-1923. The species here were mainly larches with some pockets of Scots pine and spruces. Severe wind-blow in 1968 had taken much of the larch overstorey. In view of the considerable amenity potential of this area, it was decided to draw up a management plan to assist the management of the forest. The plan would incorporate three main aims:

- 1. The production of timber.
- 2. Landscape enhancement.
- 3. Regard for recreation.

There were three ways of achieving this:

- (a) Normal rotation of felling.
- (b) Underplanting for gradual change.
- (c) Clear felling with some retention of the old crop.

It was decided to clear fell 50% of the crop with subsequent reafforestation with Douglas fir, Sitka spruce and European larch. this would involve the felling of ten thousand cubic metres over three years. Some difficulty had been experienced in establishing crops on brown earth soils with Sitka spruce doing best.

Diversifying species for colour came under discussion. Mr. M. Cosgrave pointed out that straight lines running up and down the hillside would complement a landscape already characterised by straight lines, e.g. hedges, ditches, etc.

Our next stop was at a car park and recreational centre on the shores of Lough Tay. It was an area frequently visited by tourists with a capacity for 65 cars. Running costs were in the region of £500 per annum. There was great demand in this area for public access to the forest. Before lunch a short visit to the "Fortingall Tree" illustrated the resilience of this three thousand year old Yew. It was found in 1969 to have a circumference of fifty-six and a half feet. Mr. Charles Farmer, on behalf of Members, extended his thanks to Mr. McBain.

Denis Gallagher.

Thursday, 17th May — Afternoon. Conservation and Wildlife Management.

Speaker: Mr. R. Larson.

The effects of early planting of huge blocks of monocultures of the twenties and thirties is now the problem the Commission have to face, especially when the British and Scotish public think that visual aspect is more important than timber production.

As the years passed straight lines of roads and rides were phased out and by 1935 the Commission got more power for the development of parks and other amenity walks. In some areas they are now entering the second rotation, and now is the chance to make the countryside as pleasant as possible to the public eye.

Attention should be given to roads, rides, streams, edging of different species, eliminations of straight lines and the introduction of curviture, natural regeneration, introduction of the two-storied forest where large clear fell areas would be very repelling to the public eye.

The primary object is to grow timber, but money spent on timber production could provide good grounds for Game Management and Wildlife Conservation as well. The ideal is to have one person or body responsible for large blocks of land as we have in Ireland, and marry all management and wildlife conservation rather than have different organisations in the same block responsible for different aspects of management.

One could and should keep in mind to keep trees back from roads for browsing and nesting habits, find out what animals and birds live there and the management that would help to conserve them. Certain areas should be left undrained for some nesting species. The elimination of large block burning for grouse, and retention of cover for the sparrow hawk, as they help to control the rabbit and hare population. In the Commission Forests of late the red squirrel population is declining because of the change in habitat, and not because of the increasing numbers of grey. It might also be noted that the culling in winter helps to increase the population because of more food available to living stock.

There's an estimated 300,000 red deer in Scotland and this is thought to be due to thirteen mind winters in a row and the 50% natural cull did not occur. As well as that stags were normally culled where the culling of females in the winter months would be the ideal. At the moment the Sika is not thought to be a problem, but is thought to be the scourge of the future.

The easiest species be it flora or animal is what has been indigenous for centuries and to manage the habitat of that particular species with three aims in mind:

- 1. Resource Management.
- 2. Protection of a crop.
- 3. Species Management.

P. O'Halloran.

Friday, 18th May, - Morning.

The last day of our visit to Scotland commenced with our arrival at Scone Palace, two miles north of Perth, and home of the Earls of Mansfield. Our President, Mr. Mulloy introduced Mr. Farquhar, Factor of Scone and Mr. Taylor, Woodlands Manager, as well at the President and immediate Past President of The Royal Scottish Forestry Society. Mr. Taylor gave us a brief outline of the history of the estate, which has 1,500 acres of woodland (80% conifer, 20% broadleaf). He also detailed the various silvicultural activities currently being carried out on the estate.

Our next stop was a visit to the nearby pinetum, which dates back to 1848. Near the pinetum stands a Douglas fir, grown from the original seed sent back to Scotland by Sir David Douglas in 1834. (It is interesting to note that Douglas was a one-time gardener on the estate at Scone). Most specimen trees in the pinetum have come from Japan and North America.

E. Lynch.

Friday, 18th May — Afternoon — Scone Palace.

After a most enjoyable lunch at the palace the party travelled to the estate sawmill where Mr. Taylor gave a brief account of the work being undertaken. The mill unit consists of two self feed rack benches and one push bench. Approximately 5,000 sawn cubic feet, mainly in the form of stake material, is produced every year from thinnings and other fellings on the estate. The sawn material is used on the estate, mainly in the upkeep of fences etc.

Our next stop was at a site which originally comprised heavy scrub and rhododendron. In 1953 lanes were cleared and spaced groups of oak were planted in a matrix of Japanese larch. The larch rapidly outgrew the oak and was removed in 1974. Once the stand was opened up the rhododendron and scrub species began to recolonise the area. Part of the area has been cleaned up to give wide spaced oak and the character of the stand is now of an oak/larch mixture.

It has been decided to underplant this crop and the matter of selecting the right species was discussed at length. Most of the party favoured the use of hardwoods especially beech because of its capacity to withstand shade. Norway spruce was suggested as a suitable alternative. It would keep the oak "clean" preventing the growth of epicormic shoots and should provide some material for Christmas trees.

The party then moved on foot to a 7ha plot, reforested in 1977 using Sitka spruce with a few patches of Norway spruce and Douglas fir. Previously the site covered a crop of P/22 Norway spruce which suffered repeated attacks of *Adelges viridis* and had to be removed. Mr. Taylot informed us that prior to reforestation the ares was extremely wet and was drained by a wheeled Hymac digger.

The young crop looked very promising and many in the party felt that the local estimate of yield class 16-18 was low.

Establishment costs were queried, and a figure of approximately £425 per ha was given. The necessity to fence against rabbits and to fence out a public right-of-way

traversing the area accounted for the fact that fencing alone $\cot \pm 286$ per ha. Plants were provided from a nursery on the estate and were costed at ± 24 per 1,000.

It was agreed by all that the control of weeds in this crop should little in the foreseeable future.

Our final stop was in an area of hardwood scrub. Here, representatives of Hyett Adams, distributors of Husquarna Saws, gave a demonstration on the uses of the Husquarna 140 and 165 clearing saws.

Mr. P. Fimerty on behalf of the Society of Irish Foresters thanked Mr. Farquhar and Mr. Taylor of Scone Palace for allowing us to visit the estate, for giving so generously of their time and sharing with us their experiences and problems.

J. Desmond.

STUDY TOUR PARTICIPANTS 1979

Kilbride J.

Lynagh E.

Mannion T. Mulloy F.

McGuinness, T.

O'Brien M. O'Callaghan P. O'Flanagan L. O'Halloran P. O'Halloran T. O'Regan T. O'Sullivan D.

Purcell T.

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*Tottenham R. *Tottenham J. (Mrs.)

Verling P. *Van der Wel A.

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*Collen L. *Collen Mrs. Connelly J. *Connelly Monica Conway M.

*Clotworthy R.

Cosgrave Myles *Cosgrave Mrs. Cronin J. Conway M.

Desmond J. Doolan P.

Farmer C. Finnerty P. Fleming J. Fogarty M. *Furlong Lily

Gallagher D. Gardiner J. Dr. *Glennon Paddy *Glennon Mrs.

Hanley J. Hennessy M. Hutchinson K.

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