FORESTRY COMMISSION

HISTORY

OF

KERRY

FOREST

N (W) CONSERVANCY

F O R E S T R Y C O M M I S S I O N

H I S T O R Y

of

K E R R Y F O R E S T

1923 - 1951

NORTH (WALES) CONSERVANCY

HISTORY OF KERRY FOREST

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HISTORY OF KERRY FOREST

CHAIRMAN'S COMMENTS

Kerry has always been of outstanding interest to me because it was the second of two areas (Combe Plantation, Thornthwaite, being the other) in which I made detailed investigations before the first world war. Their object was to collect data on the rate of growth of plantations, particularly at relatively high elevations. I spent about six weeks on the field work and was joined in the later stages by my assistant, G. H. Crosfield. As will appear from the Report published as a supplement to the Journal of the Board of Agriculture (quoted in the history) a good deal of trouble was taken in selecting and translating Schiffel's yield table for Norway spruce for use in assessing the rate of growth of that species. Although I looked for Sitka (Professor Somerville at Oxford had advised me that it might be doing better than Norway at high elevations) I did not then find any. It is curious that Christopher Leyland, a most enterprising forester who planted a number of exotics, should have overlooked the tree. Only later did we find the Glanmeheli trees and signs of natural regeneration.

The Norway spruce on the top of the ridge was planted in mixture with Scots pine and I quite failed at that time to attach any importance to the fact. However, I noted following an inspection with Mr. Sangar on 20/4/27:

> "More use should be made of Sitka spruce on the top land instead of Norway spruce. On this land also there is a type of vegetation on which the heather is developing or will develop after the sheep have been removed. It is important that such areas should be identified before planting and a proportion of Scots pine mixed with the Norway or Sitka spruce."

A further point of interest is that when Crosfield and I had finished collecting our data at Kerry we used it in connection with surveys of land for afforestation. Working on Cilfaesty Hill we set to work to define procedure. At first we tried zoning the land in three quality classes, but found that even with the exceptional amount of data available from the Kerry Woods we became involved in too much guess work and had to be content with one class entitled "plantable". This was the first attempt to systematise such work and proved useful when we put survey parties at work during the later stages of the war.

R.
5th April, 1952.

HISTORY OF KERRY FOREST

GENERAL DESCRIPTION OF THE FOREST

Situation

The forest lies on the Kerry hills just south of Newtown and Kerry village. It is situated mainly in Montgomeryshire but it extends into Shropshire and to the borders of Radnorshire. Much of the forest lies on the top of the hills.

Area and Utilization

From 1850 to 1890 an area of some 2,000 acres of the Brynllywarch estate on the Kerry hills had been planted with Scots pine, Norway spruce and European larch sometimes pure but more often in mixtures of varying proportions. Other species that had been planted to a limited extent were Douglas fir, Corsican pine, silver fir, Austrian pine, Abies grandis, Lawson cypress, Thuja, Sitka spruce, and occasional trees of Sequoia sempervirens, Cupresses macrocarpa and Pinus ponderosa. These plantations were situated on the steep north slopes of the Kerry hills and extended on to and just over the summit in places, the highest plantation was at 1,530 ft. elevation at Cwmgolog Wood.

Nearly all these woods were felled during or just after the 1914-18 war and about half the felled area was acquired by the Forestry Commission together with the two principal remaining standing woods Cwmgolog and Cefngolog (Glanmeheli) amounting to 221 acres. The remainder of the felled area mostly on the slopes commanded too high a price for sheep grazing and could not be acquired but an equivalent area was acquired by lease of 566 acres of Sarn Hills adjoining to the east and in a series of smaller acquisitions.

In 1912 a survey of the Brynllywarch woods, the property of the Naylors of Leighton, was carried out by Mr. R. L. Robinson (Notes on Kerry Woods - Supplement to the Journal of the Board of Agriculture).

Evidence at the time showed clearly the superiority of Norway spruce over the other species ordinarily planted at high elevation and on peaty soil.

European larch had done quite well on sheltered slopes but Scots pine nowhere shewed prospects of making a really good timber crop. Corsican pine was not successful at high elevation but at least one really good stand was

recorded on comparatively low and sheltered ground.

Douglas fir were sporadic and usually very rough but their vigour and dimensions showed what could be expected of this species on suitable sites.

Abies grandis was reported only from one site where under favourable conditions it had outgrown all other species.

European silver fir was planted sporadically in admixture with other species on many sites but owing to its slow starting had seldom done well.

The following is a list of growths recorded:-

Species	Name of Wood	Elevation (feet)	Age (yrs)	Height (feet)	True volume per acre (H. ft.)
European larch		975	23	44½	2,360
European larch		1,080	23	40	2,280
Douglas fir		"	"	50	
European larch		1,250	21	34	1,520
European larch		1,435	20	22	910
Scots pine	Block Wood	1,460	54	43	2,930
Corsican pine	Fronderw	900	40	53	6,300
Norway spruce	New Pool	1,020	43	64½	7,150
Norway spruce	Kerry Pole	1,525	42	41½	4,030
Norway spruce	Nant y Rhynau	1,400	43	51	5,840
Norway spruce	Cefngolog	1,530	38	37½	3,900
Douglas fir	Llwyn-y-rhwd	900	24	50-55	
Abies grandis	"	"	"	60	

Some of these Norway spruce plots together with 38 more measured in England, Wales and Scotland after the 1914-18 war formed the basis of the yield tables published in Forestry Commission Bulletin No.3.

There is very little mention of Sitka spruce and it is probable that the dozen or so trees scattered among Norway spruce in the lower part of Glanmeheli were undetected until the wood was acquired by the Forestry Commission. These trees were more vigorous and of greater girth than the Norway spruce but their heights were not greatly in excess of the Norway spruce probably due to the wind limiting growth or breaking the leaders once they overtopped their neighbours. When the wind got into this wood all the Norway spruce were blown but many of the Sitka spruce remained standing as isolated trees and subsequently developed branches from adventitious shoots up their stems and produced quite a crop of natural regeneration.

Almost the last remnants of the old woods were felled during the 1939-45 war. The removal of the beech belt on the western edge of Glanmeheli wood after the 1914-18 war had let the wind in and the wood was gradually blowing down. The ice-storm of January 1940 did severe damage but none the less it was unfortunate if unavoidable that these two interesting woods had to go.

Details of Area Utilization are as follows :-

TABLE I

Acquisition Report Proposals

Acquired from	By	Date	Plantations Acquired	Plantable excl. Column 4	Nurseries	Agricultural	F. W. H.	Unplantable excl. Column 4.	Other Land		Total
									Description	Acreage	
(1)	(2)	(3)	(4) acs.	(5) acs.	(6) acs.	(7) acs.	(8) acs.	(9) acs.	(10)	(11)	(12) acs.
Midland Bank Ltd.	Convce.	5. 9.23	221	543	-	-	-	-	-	-	764
Badman Williams & Co.Ltd.	"	26. 9.23	-	122	-	-	-	-	-	-	122
E. Longhurst & Sons	"	11.11.25	-	-	-	18	-	-	-	-	18
David Davies, Esq.	Lease	22.12.24	-	566	-	-	-	-	-	-	566
Mrs. Cordelia Phillips	Convce.	17. 6.27	-	53	-	-	-	-	-	-	53
E. Griffiths, Esq.	"	28. 7.27	-	239	-	-	70	-	-	-	309
A. L. Harper, Esq.	"	22.11.27	-	150	-	-	-	-	-	-	150
W. E. Brock, Esq.	"	11. 5.36	-	26	-	-	-	-	-	-	26
The Rt.Honorable The Earl of Powis	"	31. 5.37	-	71	-	-	-	-	-	-	71
Dinam Estate Co. and others.	Lease	27. 9.46	-	66	-	-	-	-	-	-	66
W. R. Brock, Esq.	Convce	16. 6.47	-	94	-	-	-	1	-	-	95
Mrs. M. Huffer and others.	"	31. 1.48	-	53	-	-	-	-	-	-	53
H. E. Price, Esq.	"	30. 8.49	-	33	-	-	-	-	-	-	33
Total			221	2016	-	18	70	1	-	-	2326
Disposed of	NIL										
Net Total			221	2016	-	18	70	1	-	-	2326

TABLE II

Present Utilization

			Acres
(a)	Woods and plantations:	Acquired	4
		Formed by Forestry Commission	2,176
(b)	Awaiting planting:	Felled	13
		Bare	6
(c)	Nursery		11
(d)	Agriculture	Farmed by Forestry Commission	-
		Tenanted	-
	Transferred permanently to Ministry of Agriculture		
		Agricultural	70
		Forest Workers' Holdings	-
		Unplantable	-
(e)	Forest Workers' Holdings		45
(f)	Unplantable		-
(g)	Other		1
	Transferred temporarily to Ministry of Agriculture included in (b) above		NIL
		Total	2,326

The moorland around the forest is the home of the famous "Kerry Hill" sheep. Large scale reseeding to grassland, carried out since 1941 has greatly increased the numbers the area can support, and also led to large herds of cattle being annually brought up from lowland farms to 'summer out' on the hills.

Most of the small farms, formerly consisting of a small acreage of fields and an adjoining hill, have been bought up and linked into larger units and are run on commercial lines by private concerns or the County Agricultural Committees. This has helped to compensate for the human drift from these upland farms as the new large units can be handled by mobile labour.

Large scale re-afforestation, afforestation and grassland formation has reduced the grouse population but this still exists to a small extent on the remaining heather/bilberry areas.

The sporting rights are still held by the estates that leased or sold land to the Commission.

With reseeding successfully augmenting the nation's food supply the acquisition of more land has practically stopped, even the remaining several

hundred acres of 'first world war' felled woodland are being heavily grazed and will not be surrendered lightly for replanting; though in most cases they occupy steep uncultivatable slopes.

Physiography

The plantations range from the 600 ft. contour to the highest point of the hills at 1,630 ft. and vary from small scattered lowland blocks along the north margin through blanket plantations along the steep north slopes of the Kerry and Sarn Hills to more scattered blocks spread over a wide area of plateau moorland falling gently to the south and south-east.

Exposure is severe along the north facing shoulders and considerable on the south sloping plateau. Heavy snow with high winds is not uncommon.

Geology and Soils

Apart from the highest edge of the plateau and a few shoulders soil is fairly deep throughout the forest. The Shropshire plantations are on Old Red Sandstone with patches of clay loam and incipient pan overlying sandstone rock.

The Montgomeryshire side of the forest is a Silurian formation with a shaley loam soil. Rock outcrops are fairly frequent but they are not hard and a fair amount of soil between the laminations permits tree growth if there is sufficient covering to give a start.

The whole of the top land has a thin covering layer of peat.

The soil derived from the Old Red Sandstone is particularly fertile and responds well to ploughing whether for planting with trees, nursery purposes or arable crops and subsequent reseeding.

The Silurian soils are only slightly less fertile but respond to similar treatment.

Vegetation

Heather/bilberry associations covered most of the higher ground before afforestation with some gorse on the drier areas and rocky banks and patches of Juncus/Molinia where drainage was impeded. The hill sides were mostly bracken and grass covered. Reseeding has now eradicated most of the above vegetation outside the forest area.

Meteorology

Excessive dryness is rare owing to the frequent mists which occur.

Hollows on the plateau land are subject to severe spring and autumn frosts which probably occur even in July and August.

The annual rainfall is about 45 in. Low night temperatures are frequent. Short duration blizzards are common in winter and in 1940 the area suffered a severe "glazed" frost, which did irreparable damage to the plantations. This storm, which extended in a narrow belt from Aberystwyth across mid Wales and southern England to Winchester, struck several of the North Wales forests severely and Kerry suffered as much as any forest particularly plantations at high elevation.

Douglas fir was broken wholesale but fortunately the spruces stood up better although very many were broken or bent. The Douglas fir at high elevation was already rough and uneven and the ice damage still further drastically reduced the number of well shaped trees whereas the spruce, Sitka spruce in particular, was of good form and even where a high proportion of the crop was injured there were sufficient good trees left to form a crop.

The snow of 1947 did extensive local damage over small areas where drifts piled up and brought the trees down wholesale but the total area affected was fortunately small.

Damage from exposure, that was so apparent in some of the forests nearer the sea after the 1947 winter, was negligible at Kerry.

Risks

In the early years the forest was one of considerable fire danger owing to the presence of a long length of main road and to the inflammable nature of the vegetation both in and adjoining the plantations.

The most accessible plantations are now well into the canopy stage and brashed, whilst the most recent (post 1946) areas are either plough planted adjacent to reseeded areas; or establishing themselves quickly so that fire risk is not now severe throughout the forest, though it is traversed by one main road and interlaced with minor roads.

Since 1948 new extraction roads have been constructed throughout the forest and these should lessen the risk of any large area being burned.

Outbreaks of fire have not been numerous and the total area burnt is 91 acres of which 43 acres were destroyed in one fire in 1933.

The reseeding of adjacent hills has led to the erection of new stock-proof fences and few animals stray from their correct pastures.

Rabbits are present in the older plantations but are kept down in numbers by permanent warreners - activities within the forest have driven off most of the foxes and few remain.

Pine weevils were a very serious pest for the first 15 or so years and in spite of the expenditure of much money on trapping extensive damage was done.

In 1946 an outbreak of Rhabdocline pseudotsugae occurred in Compartment 20 affecting 20 of the 25 acres in the compartment, the affected stems were removed in 1951 It appears to be confined to this compartment where the Douglas fir is of one of the "blue" types.

Since 1948 blackgame have done some damage in Badgermoor nursery, in the early morning and evening, by destroying seedling and transplant leaders but the use of automatic bird scarers seems to have reduced this trouble.

Roads

The earlier blocks of the forest were divided into rectangular compartments, unrelated to extraction requirements. For the new roads constructed since 1948 fresh alignments had to be felled in most cases, these have enabled the regular sale of standing thinnings from hitherto inaccessible areas, and contractors are able, in other than very wet weather, to take road lorries right to the scene of the felling.

The main road skirts the western edge of the main block of the forest; a minor road runs along the ridge of the Kerry Hills but roads were lacking to some of the outliers and up the valleys particularly in the Sarn Hills in the east of the forest. During the past four years 13 miles of road have been constructed at a cost of £14,434.

In the 600 acre Sarn Hill block the natural extraction routes lay down hill to the one farm track which was narrow and very hilly and ran across land not in the occupation of the Forestry Commission. It was also necessary to plan one or two roads to run from the bottom up to the old coach road at the top in order to extract timber from the upper ground and in order to connect this block with the rest of the forest.

Construction

A roads gang of five men was formed and a dozer hired in September 1948, but progress was poor until a more efficient dozer was employed.

In 1950, the same teams continued at work and a further .7 miles were dozed out. The dozer operators improved their technique and learnt how to camber the formation so that ditching by hand was no longer necessary. The road gang were able to catch up on the culvert work and stone some of the softer spots.

In 1951, another mile of road was dozed and the plant was moved elsewhere as ground conditions were so bad on the roads still to be done. The roads gang continued their work of improving the drainage and strengthening the carriage way where wet weather and traffic showed up weaknesses. Records of road costs for individual roads are not too accurate as there have been two clerks of works supervising this forest, neither of whom were satisfactory. The forester has taken over the work at odd times and finally has exercised all supervision and reporting. The over-all costs are correct, and show fairly economical rates as far as they go. These roads will still require attention for another year until they have settled.

A table of roads and their costed expenditure follows:

P = Permanent Road
F = Feeder
TT = Tractor Track

ROAD COSTS

Road No.	Class	1949 Length	1949 Cost	1950 Length	1950 Cost	1951 Length	1951 Cost	1952 Length	1952 Cost	Total Length	Total Cost	Total Rate per mile	Remarks
1	P	1.0	650	-	345	-	348	-	51	1	1403	1400	
2	P	.6	490	.6	398	-	72		417	1.2	1377	1140	
3	P	1.2	1210	.24	537	-	628	-	21	1.44	2396	1670	
4	F	.1	225	.1	147	-	-	-	-	.2	372	1860	
31	P	.6	540	-	156	-	27		52	.6	775	1290	
41	P	.7	875	.1	476		45		209	.8	1605	2000	
401	TT	.3	200							.3	200	660	
101	F	.1	280	.2	18					.3	298	1000	
7	P			(.1)	188		27			(.1)	215	-	unfinished
42	F			.4	170					.4	170	425	
53	TT					.4	172			.4	172	430	
54	P			.4	577	.4	336		26	.8	939	1140	
56	P			.6	?	-	162			.6	162	270	
61	P			.3	201	.3 (.5)	387	(.5)	585	.6(.5)	1173	1950	unfinished
81	P			.9	703		248		18	.9	969	1080	
82	F			(.5)	?					(.5)	?	-	
102	TT			.15	95					.15	95	630	
103	F			.4	180					.4	180	450	
411	TT			.36	?					.36	?	-	
541	TT			.2	152					.2	152	750	
701	TT			.5	102					.5	102	204	
Old Coach Rd.	P			1.6	1172		352	.2	164	1.8	1688	940	
Total	P	4.1	3765	4.74	4753	.7	2632	.2	1543	9.74	12693	1300	
	F	.2	505	1.1	515	-	-	-	-	1.3	1020	790	
	TT	.3	200	1.21	349	.4	172	-	-	1.91	721	378	
Grand Total		4.6	4470	7.05	5617	1.1	2804	.2	1543	12.95	14434	1120	

The Galion grader has been used to make new formations as well as for clearing ditches and general maintenance. An annual visit from this machine should be the main system of maintenance provided attention is given to drainage during and at the end of any forestry operation.

There are still $2\frac{3}{4}$ miles of road to be made which are dependant on the acquisition of way leaves and good ground conditions. It is intended to finish these in 1952.

The present planning allows for 15 miles for 2,326 acres which is above the average of 3 miles to one square mile of forest. This is accounted for by the steep slopes and complexities of the Sarn Hills and the number of small blocks of plantation each requiring its own road.

Labour

Sufficient rural labour has always been available - with one or two special exceptions, such as road felling, preparation of Christmas trees and delayed nursery work - for the work to be done.

During the war the minimum necessary maintenance work was carried on and consequently heavy arrears of brashing and thinning had to be faced when conditions returned to normal; against these arrears ranged the usual post war labour problem and transport was provided to fetch men from the environs of Kerry and Sarn villages to augment the purely local labour supply from the Forest Workers' Holdings.

The present labour strength of 45 would be adequate but for the fact that it has been necessary to make a heathland nursery of 11 acres on the Old Red Sandstone soil at Badgermoor but this was a temporary expedient to meet the immediate post-war need in North Wales.

SILVICULTURE

Preparation of Ground

Prior to 1939 little pre-planting preparation of ground, apart from the clearing of litter and the removal of the few rabbits, was practised. Rabbit-proof fencing was necessary on some of the felled woodland sites but this was exceptional for the acreage then enclosed.

In the early 1930's turfing of the wetter areas was practised and turfing also became gradually customary on the poorer sites with a dense heather or

bilberry vegetation. Shallow drains supplied most of the turves and on much of the area these sufficed to remove any surplus water but some hollows and flats required a network of main drains to carry off spring water effectively.

Choice of Species

Evidence from the Leyland plantations shewed that Douglas fir was capable of growing to large size on the hill sides and in the early years Douglas fir was planted wherever the soil was free of peat and where there was some shelter.

Norway spruce was planted on the hill tops and Sitka spruce used on slopes intermediate in character between Norway spruce and Douglas fir ground but in 1930 it was realized that Sitka spruce stood up to exposure better than Norway spruce and in all subsequent planting Sitka spruce was used on the tops of the hills and Norway spruce was reserved for more sheltered slopes and frost hollows.

In 1926 a small area of European larch was planted on a sheltered bracken slope and in 1929 some 11 acres of Japanese larch were tried on a dry exposed gorse/bracken face at Cefn Vron.

On one or two exposed dry dense heather areas of peat over loam a Sitka spruce/Scots pine 1 row : 1 row mixture was planted in which the pine soon outgrew and smothered the spruce.

A few acres of pure Picea omorika were surface planted in dense heather at Badgermoor in 1928 and now form a very irregular plot partly in canopy and brashed and partly quite open with the heather still predominating.

Apart from the latter variations described above the aim from 1929 onwards was to make Kerry essentially a spruce forest with Sitka spruce predominating.

Following the last war the tendency has been to plant a Sitka spruce/ Corsican pine mixture in the ratio of 2 or 3 : 1 by rows on ploughed heather moorland sites with pure Corsican pine or Scots pine on very dry humps or rock and marginal Japanese larch belts against neighbouring land constituting a fire risk.

A small amount of Abies grandis, Abies nobilis and Tsuga was planted on an experimental scale in failed areas in the old standing woods of Glanmeheli

and Cwmgolog. From this it is clear that Tsuga does very well even on heather and at high elevation but provided exposure is not too severe Abies grandis has grown satisfactorily in considerable exposure but only where heather peat is absent and Abies nobilis although slow starting is quite promising.

Planting

Spacing has varied from 6 ft. x 6 ft. for Douglas fir to 4 ft. x 4 ft. for Norway spruce. The current (1951) practice is 5 ft. x 5 ft. for Sitka spruce and pine, 4½ ft. x 4½ ft. for Norway spruce and 6 ft. x 6 ft. for Japanese larch.

Most of the planting has made use of transplants of various ages but in some years because of a transplant shortage extensive use has been made of seedlings.

From 1924 to 1926 all species were notch planted with mattocks. In 1927 the practice of spreading all planting turves from shallow drains became general on all except the drier mineral soil sites where any vegetation was screefed aside with a mattock over about a square foot and the tree planted on the area so cleared.

In 1930 screef planting of spruces was abandoned and turf planting was extended on to all peat areas, grass and bracken sites being planted with a mattock without screefing.

It is interesting to note that intensive draining and turf planting in 1930 enabled good crops of Sitka spruce, Tsuga, Abies grandis and some Abies nobilis to be established in failed areas in the old woods of Glanmeheli and Cwmgolog.

In 1938 an Oliver double-furrow plough was used successfully to prepare P.38 and P.39 Calluna ground for Sitka spruce. Results were extremely good with only .5% failures on the very exposed sites whereas turf planting the same year gave 25% failures. Although ploughed at the same time as the P.38 ground the P.39 planting results were almost as good on the 18 month old shallow furrows.

When further moorland ground was tackled in 1949 at Masons' Bank a Ransomes solotrack plough gave excellent results on burnt-over heather, with even, easily planted furrows giving few failures.

In 1950 some 96 acres of heather/gorse covered old woodland, with large stumps, was deep ploughed by R.L.R. (behind a D4 tracklayer) successfully.

All planting on ploughing at Kerry has been done on top of the furrow and the rate of establishment has been remarkable compared with similar sites surface or turf planted a few years earlier during the 1940-45 period when machinery for ploughing was not available.

From 1924-1928 inclusive an average of 270 acres of ground was planted yearly with 1925, the peak, at 350 acres.

From 1929 to 1941 progress was slow at a yearly average below 50 acres but a slight increase thereafter reached a maximum when 107 acres were planted in 1950.

In 1951 the planting of acquisitions was brought right up-to-date and henceforth any expansion of the afforested area will depend on new ground coming in.

Beating-up

In early years beating up was heavy on account of deaths from pine weevils. Frost was also extremely damaging to spruce screef planted into peaty soil. With the gradual elimination of the weevils and the extended use of turfs failures were reduced.

From 1924 to 1929 failures among the Norway spruce and Douglas fir were beaten up with the same species but from then on Sitka spruce became the staple tree for beating up of all the failures on peat areas or where exposure rated consideration. Norway spruce was still used on frosty sites.

In 1930 turf planting was adopted for all beating up on peat but mattock planting in a screef remained the practice on mineral soil areas.

Beating up was carried on for many years in the early plantations and as late as 1930 a 33% beat up of P.24 Douglas fir with Sitka spruce is recorded. In 1936 some Japanese larch were inserted in P.24 Norway spruce gaps.

To aid this process of late beating up large plants were used when available and it is apparent today that many beat up trees never succeeded in keeping company with surrounding originals but were smothered after a few years.

Replanting

Badgermoor was a dry heather area planted P.29-30 with strong Sitka

spruce and Scots pine but without turfing. The Sitka spruce went into check and during the following 10 to 12 years many gradually died out. In 1941 all areas in heather with a 75% failure on P.28 and P.29 Sitka spruce at Badgermoor were ploughed through with a Ransomes Solotrack bar-point plough and replanted with a Sitka spruce/Scots pine 2 : 1 mixture by rows, in 1942. At the time of writing the Scots pine have been growing well for some years and have got well ahead of the Sitka spruce but after three frost free seasons the latter have now got free of the heather and seem likely to overtake the Scots pine in a few years.

In the spring of 1950 two small fire areas of 9 and 5 acres originally planted in 1928 and 1929 with a Scots pine/Sitka spruce mixture were R.L.R. ploughed and replanted with a Sitka spruce/Scots pine 2 : 1 mixture by rows.

The Corsican pine suffered heavy deaths in 1950 and were heavily beaten up with Sitka spruce in 1951, these areas now almost pure Sitka spruce are coming away well.

Other Maintenance

Drains upkeep was never necessary on any great scale but since large scale thinnings commenced in 1947 much has been done in the way of deepening and freeing from brash the original drains in the wetter hollows.

Some staking of wind-loosened Douglas fir on exposed slopes was necessary in 1931 but by 1934 these trees were recorded as successfully firmed-in again.

Weeding took two main forms in the early years.

(a) Freeing checked surface-planted spruce from smothering heather.

(b) Bracken and gorse cutting.

The former was a long and expensive undertaking in the early years as the planted trees were repeatedly cut back by frost and attacked by weevils and often became smaller and more difficult to weed before they eventually came away. This became less of a problem with the introduction of turfing and quicker establishment on the poorer sites; and no weeding, beyond keeping isolated patches of gorse or heavy grass growth down, is necessary on the ploughed areas.

Past treatment of Established Plantations

Brashing commenced in 1939 with the sawing off of rideside branches and the operation was extended in 1940 to chain wide strips through all the

older compartments breaking them up into 10 acre unbrashed blocks for fire protection purposes.

In 1942 more chain wide racks reduced the blocks to 5 acres and in compartments 1, 8, 13 and 14 Douglas fir was completely brashed in the advanced patches.

Gradually the acreage of brashing increased until in 1946 and onwards all the older and more sheltered compartments were even enough to permit their being done completely.

To reduce costs in 1946 brashing of every third or every other row of trees was tried but this system was found to reduce the speed of extraction and create the risk of injury to horses working on the steep slopes so that contractors insisted on complete brashing of every row before they would buy thinnings standing or at stump.

All brashing at Kerry is done with curved hand saws. No high pruning has been carried out.

Cleaning

Practically all the forest has been planted on former grazing land or cleared ex-conifer sites and coppice growth has only occurred in one small 14 acre block at Rhos Dingle on an old oak site and this was selectively cleaned in 1942.

A proportion of the better oak growth was left and to-day this plantation is really a mixture of Douglas fir and oak in the ratio of approximately 90% : 10% after two thinnings removing the poorest of each species.

In the rest of the forest occasional mountain ash and birch occur and are left if they do not interfere with the crowns of good conifers around them.

Thinning

The return of men from the armed forces enabled a small start to be made on the war time accumulated thinning in 1946 with 13 acres done; in 1947 this had grown to 100 acres in the Forest Year and thenceforth about 200 acres became the annual area tackled.

It was soon apparent that the available labour strength could not expect to keep pace with the silviculturally necessary thinning programme and do all the other equally necessary maintenance, new planting and nursery work.

Consequently in 1947 the first contract sale of standing thinnings was made with a local contractor.

The scope of the contractor's and the department's work was at first limited by inaccessibility especially in the large steep Sarn Hills block but with the construction of adequate roads it is now possible to put all the produce straight on to road lorries with one brief horse tush from stump.

The table below gives details of the Kerry thinnings since 1946. The annual acreages are not yet as high as they should be, if plantations are to be entered when silviculturally necessary without long delay. This work has been held back by departmental labour having to complete considerable planting and nursery programmes and the contractor having difficulty in maintaining an adequate felling gang. It is hoped these difficulties will shortly be overcome.

Table of Thinnings

F. Year	1st Thinning done by		2nd Thinning done by		Felling (acres)	Remarks
	F.C. (acres)	Contractors (acres)	F.C. (acres)	Contractors (acres)		
1946	13.0	-	-	-	-	
1947	103.	-	-	-	-	N.B.
1948	115.2	39.5	13.5	-	-	10.5 acres
1949	105.0	46.0	41.0	-	-	felled are
1950	99.0	11.0	34.0	12.0	-	part of compt.
1951	132.5	36.5	112.5	19.0	10.5	20 - Rhabdocline pseudotsugae on Douglas fir.

Felling

In the period 1940-1944 the last standing blocks of acquired plantations were felled in Glanmeheli and Cwmgolog Woods after being severely ice-damaged in 1940. Some marginal shelter belts were left but soon suffered so severely from blast that they too were felled in 1946.

About 1946 20 acres of Douglas fir in Compartment 20, Shircwm Dingle, developed a severe attack of Rhabdocline pseudotsugae and the growth rate fell off so severely that by 1951 at least 25% of the crop had died and the rest was putting on negligible increment so a clear-felling was made. The sheltered nature of the site allowed a scattering of well shaped healthy trees to be left. It is now proposed to replant this area with Tsuga.

Conclusions

It is apparent that any new moorland areas acquired should be ploughed and on all exposed sites planted with Sitka spruce unless very stony. The gain from mixing pine with the spruce is not apparent as the latter establishes itself very quickly on furrows of the excellent soils predominant in the area whereas Scots pine tends to get severely blasted or mis-shapen and Corsican pine is difficult to get successfully through the dry late spring common at Kerry.

Once off the more exposed sites the choice of species is wide but as most of the forest is above the 1,000 ft. contour, certain choices like Douglas fir and the less hardy pines, liable to suffer from frequent snow and ice damage, are inadvisable. In the snow storm of 1947 damage was often worst in the deepest "cwms", owing to drifted accumulations breaking down whole groups of trees on the steep slopes. Most of this damage will be undetectable in the final crop but in the interim, thinnings are in a much lower class than those of Sitka spruce or Norway spruce which suffered less.

Where ploughing is not feasible on shallow soiled exposed shoulders or rock Pinus contorta gives a quick, even establishment. This species - surface planted - also provides the most economical way of filling in the gaps in the original 'spruce on heather' plantings which are too large to close over but not large enough to permit ploughing; with most of the blocks brashed, and regularly checked by warreners these gaps could now, in most cases, be planted up without being 'rabbit fenced'.

Japanese larch has been very little used but on bilberry/heather slopes too steep to plough it will be the cheapest tree to establish and the quickest to reach pit prop size.

As the soil is capable of growing vigorous Douglas fir on the hill sides up to 1,500 ft. or more it may well be possible to grow crops of better form by mixing with Sitka spruce. A few Douglas fir used for late beating up in Norway spruce and Sitka spruce suggest that provided it is kept well hemmed in and struggling for light it can develop into a straight and finely branched tree very different from the pure crops we now have.

Tsuga is certainly worth use on a limited scale.

Conservator's Observations

This forest was one of the earliest in North Wales and it is very unlikely that we should have been so daring as to plant over the crest of the hills in full exposure at 1,600 ft. had there not been the evidence of the previous woods to show that spruce would grow at high elevation.

Exposure never proved such an adverse factor in establishing plantations as the initial difficulties with heather ground before the days of turf planting and ploughing. Pine weevils and frost threatened us with failure in some areas but eventually the plantations came away well with the exception of a limited area, mostly at Badgermoor, where some are still in check after 24 years. The early difficulties of establishment, without the knowledge of modern planting methods and means of peat control, are scarcely now apparent.

The early plantations provided most valuable data as to the growth of the more common conifers at high elevation but it was a pity that so very few Sitka spruce had been planted and none under the most unfavourable conditions.

All that now remains of the old woods are a few bedraggled larch outside our boundary and a couple of patches, on some of the worst sites, of Scots pine through the crowns of which the Forestry Commission planted Sitka spruce are already pushing up.

APPENDIX I

Notes from Inspection Reports

Inspections have been carried out by senior officers as follows:

Date	Inspecting Officers
April 1927	Chairman
" 1935	Chairman
October 1936	Assistant Commissioner
April 1937	Chairman
" 1939	Chairman
July 1943	Divisional Officer
November 1943	" "
February 1944	Assistant Commissioner
April 1944	Chairman
June 1944	Divisional Officer
December 1944	" "
October 1945	" "
April 1946	Chairman
October 1946	Conservator
November 1946	"
January 1947	"
March 1947	State Forests Officer
April 1947	Conservator
May 1947	State Forests Officer
July 1947	Conservator
October 1947	"
Sept. 1948	Director (Wales)
October 1948	State Forests Officer
January 1949	" " "
April 1949	" " "
April 1949	Chairman
June 1949	State Forests Officer
November 1949	" " "
February 1950	" " "
May 1950	Conservator
August 1950	State Forests Officer
November 1950	" " "
February 1951	" " "
July 1951	Welsh National Committee
October 1951	Chairman

In the early years of the forest constant reference was made to the slow establishment of the spruces surface planted on the heather/bilberry and **Molinia** areas and the need for adequate weeding and cleaning of drains was stressed.

As the high proportion of 'checks' became apparent in the Norway spruce on these vegetation sites, the layout was altered on the new areas, by putting turfed Sitka spruce on the poor high ground throughout and restricting Norway spruce to sheltered mineral soil sites or frost hollows.

The value that would have been gained from ploughing the poor moorland areas in the early years was appreciated in the late 1930's and was prescribed for new areas. The first ploughing on any scale was carried out at Kerry Pole in 1938.

Extracts from selected Inspection Reports

20.4.27. Mr. R.L. Robinson (now Lord Robinson) and Mr. Sangar

Plantation work - Beating up should be delayed until it is quite clearly wanted. With large areas of spruce many plants may be wasted by replacing unhealthy looking plants already in the ground. Examples were seen where living spruce had been pulled up.

More use should be made of Sitka spruce on the top land instead of Norway spruce. On this land also there is a type of vegetation on which the heather is developing or will develop after the sheep have been removed. It is important that such areas should be identified before planting and a proportion of Scots pine mixed with the Norway or Sitka spruce.

14.4.31. Mr. R.L. Robinson (now Lord Robinson) Mr. A.P.Long and Mr. F.C.Best.

The Sarn Hill block

The Sarn Hill block was inspected. Considerable gaps still exist in the Norway spruce in the heather and bilberry area along the top. This is to be left till all checked trees and all living trees covered by the grass have definitely started growing, then beating up is to be done with Sitka spruce on turfs.

(F.C.B.)

24.4.35. Chairman and Assistant Commissioner (Mr. W. L. Taylor)

Badgermoor area P.28 and P.29

The checked Sitka spruce were not considered hopeless as was shown by the count of some 200 trees which showed only a third really in complete check. A curve plotted from the data showed a remarkable emergence from check. Some plots are to be selected and permanently marked and the percentage emerging from check plotted for each year back from the present and the curve thus arrived at used to predict the further development of the plot. Data collected in future years will show how far such a curve can be relied on. This method can be usefully used in checked spruce plantations at other forests as well.

5.4.37. The Chairman and Assistant Commissioner (Mr. W. L. Taylor).

Badgermoor area

This area P.28-29 was walked over. The small area ploughed and planted P.35 after being burnt was seen and the healthy condition of the plants noted. The heather cutting experimental plots were walked over, no marked improvement being noticeable. Some bad patches were seen on the area, notably Compartments 65 and 66, south-west side, but on the whole it was considered that there had been a considerable improvement during the last two years and that in time the plants would come away. Meanwhile two of the bad patches should be marked out in half acre plots and a census of the plants on the plots taken, making use of planting sticks to find the plants. The Picea omorika block was looked at. It was seen that in places where the ground was not too bad the trees were getting away very well.

7.4.39. The Chairman and the Assistant Commissioner Mr. Taylor.

Badgermoor Compartments 65 and 69.

The worst areas of bad check show no improvement yet, but a general improvement was to be seen on those areas where a better growth of heather and/or a mixture of bracken indicated better conditions. Small plants in dense heather should be weeded lightly. No beating up is to be carried out until the area is more advanced, when mound planting might be tried.

Chairman's minute on this inspection:-

Badgermoor. There has been some improvement here since 1937 but parts are still in doubt. We now know that ploughing would have solved our main difficulties. There is an adjacent area of similar ground which might be obtainable and treated in that way.

5.5.42. The Chairman and Acting/Divisional Officer Mr. R. H. Smith.

P.25. Compartments 17, 18.

In this area the Chairman remarked on the quantity of ice damage on the Sitka spruce, but after some examination it was decided that sufficient good trees remain to make a crop if there is no repetition of the serious damage. The pruning of green branches was criticised but this was done in the process of cutting the racks to divide up the area.

P.24. Compartments 9, 10, 5, 6, 4. Some P.24 Norway spruce in Compartment 10 in heather were seen and the Chairman instructed that that these should be beaten up with Scots pine, big plants to be used in checked areas but those now coming out of check were to be left alone.

18.4.44. Chairman and Assistant Commissioner, Mr. A.P. Long.

Badgermoor, Compartment 68, P.29. Pine and Sitka spruce mixture. It was noted that a small patch that had been ploughed with a horse plough in P.35 and replanted with Sitka spruce were now beginning to get away well. In other parts the Sitka spruce were getting up well with the pine.

Compartment 65, P.28. A bad patch of Sitka spruce in heather was next examined and the Chairman thought that it would form a useful comparison with the ploughed patches. The Sitka spruce are getting up well in other parts of this compartment and the Chairman thought they would help to get a number of the poorer trees up adjoining.

Compartment 67. Some Picea omorika were examined but the Chairman thought they did not look as well as the Sitka spruce.

Sarn Hill. Compartment 18, P.25, Sitka spruce. This compartment suffered very severely from ice damage. Most of the trees have now made a new leader. The Chairman did not think much could be done at present. There appeared to be sufficient good trees left to form a crop and the damaged trees were putting on girth and would soon reach pitwood size when they could be taken out.

Chairman's minute:-

No doubt deep ploughing is the solution of Badgermoor. It is interesting to note how improvements in growth can be correlated with the presence of even sparse bracken in the heather.

Over Kerry as a whole the growth is quite pleasing (as was only to be expected).

Thinning and the improvement of extraction are now the things to watch and develop in the older parts.

24.4.46. The Chairman and Director (Wales) Mr. A.P. Long

Compartment 18, P.25, Sitka spruce. Some 4 acres that had been brashed were inspected in a section that had been severely damaged with ice break. The Chairman remarked that it was difficult to detect malformed and damaged crowns now that the canopy was closing. It was noted that a large number of damaged trees had again made a leader and that some of the better shaped ones should be accepted into the crop, as when eventually removed in thinning the poles could be converted in two lengths, above and below the bend.

Compartment 40, Sitka spruce. Thinning had been commenced and this was inspected. The Chairman said that the plantation appeared to be shaping up quite well and looked more promising now, than when the defective and ice broken trees were growing. Some of the larger gaps should have grown over in 2 or 3 years. The large number of double trees growing on the ridesides were considered by the Director to have been the result of sheep damage. When ploughing fire-rides, a firm track to permit access of fire implements etc. should be left in the centre for preference.

Chairman's minute:-

Now that thinning has been made in Compartment 40, Sitka spruce, it is possible to see some of the results of the ice storm of 1941. It would appear that by careful thinning quite respectable crops will result.

21.4.49. The Chairman

Badgermoor: Noting the slight improvement on the checked areas, the Chairman instructed that they were not worth spending any more money on in the way of beating up or ploughing small pieces. The gaps would eventually close up.

Nantyrhynau: Recently first thinned P.27 Sitka spruce was walked through and the Chairman remarked how well the Sitka spruce had recovered from the ice damage of 1940 winter.

Chairman's minute:-

The general development of Kerry (excluding most of Badgermoor) struck me as good. The new road is going to make a vast difference in extraction. There is still a tendency to be over-elaborate with them.

APPENDIX II

Supervision

Conservators	1945/47	Mr. R. H. Smith
	1947/	Mr. F. C. Best
Divisional Officers	1924/25	Mr. D. W. Young
	1926/30	" O. J. Sangar
	1931/37	" A. P. Long
	1937/39	" A. H. Popert
	1939/41	" C. E. L. Fairchild
	1941/45	" R. H. Smith
State Forest Officers	1947/51	Mr. W. A. Cadman
District Officers	1924/25	Mr. I. L. Simpson
	1926/27	" A. H. H. Ross
	1927/28	" C. E. L. Fairchild
	1928/36	" F. C. Best
	1936/40	" W. A. Cadman
	1940/42	" W. D. Haldane
	1942/46	" W. G. Roberts
	1946 to date	" C. E. Peaty
Foresters	1924/28	Mr. A. Price
	1928/30	" C. R. Wellington
	1931/40	"S. A. Watkins
	1940/41	" I. Griffiths
	1941/45	" W. S. Roberts
	1945/48	"R. J. Jennings
	1948 to date	" A. Hughes

Librarian (Alice Holt)

134/51

History of Kerry Forest

Will you please make the following two small corrections in the Kerry Forest History, which was sent to you on 25.8.55: -

(1) Page 26. The forester from 1931/40 should be "S. Watkins" (not A).

(2) Page 26. The forester from 1945/48 should be "R.J.Jennings" (not J).

M-Alson

6.9.55.

Kerry

KERRY FOREST

OFF O.S. SHEETS MONTGOMERY 43 S.E.
44 N.W., N.E., S.W., S.E.
SHROPSHIRE 68 N.W., N.E.

FROM KERRY
TO WELSHPOOL
Glan-Mule Bridge
Kerry Station
Glan-Miheli
Miheli Brook
The Mule
Mill Pond
Reservoir
Reservoir
Drefor
Llwyn-yrhaod Dingle
Cefn-gwyn
Windy Hall
Lower Rhôs
Rhôs Dingle
Fish Pond
New Pool
New Plantation
FROM DOLFOR
Rudnershire Gate
Block Wood
UNMETALLED
Bryn-ŷch
Nant-y-Bridell-fedw
Nant-y-rhynau
Kerry Pole Cottage
Kerry Pole
Husky Hall
F.W.H.
Rhuddur
Forest Lodge
Rhuddur Brook
Ros-gôch
Cum-foel
New Cum
Gloddfa
Foel
Bettws Grange
ANCHOR
Anchor Inn
Medwaleddi Brook
Rhuddlan Brook
Cefn Fron
Bettws Hill
River Clun
FROM FELINDRE
FROM BEGUILDY
TO BETTWS-Y-CRWYN
Rhos Fiddle Peat
Nant of the Forest
Glanmehell
Badgermoor
SURVEY
SARN
TO CHURCH STOKE
Cwm-carl
Caebitra
Old Hall
Bachaethlon
Gyfenni
Lower Hill
Green Dingle
Cwm-golog
Sarn Hills
This length of old Coach Road now F.C. (all weather)
Long Plantation
Canklin Stone
Riddings Wood
Long Pike Hollow
Cum Môch
Ditch Dingle
Mason's Bank
Water Works (BISHOPS CASTLE CORPORATION)
TO BISHOPS CASTLE
TO MINSTON
Sam Block

KEY
EXISTING COUNCIL ROADS
EXISTING FOREST ROADS
F.C. BOUNDARY
M.A.F. BOUNDARY

FORESTRY (Wales) COMMISSION
ROADS PLAN, KERRY
SCALE 6"=1 MILE
DRAWN BY [illegible] DATE 2.4.48
DRAWING No R.E.W.38