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HISTORY  
OF  
AUCHENRODDAN

FOREST

S(S) CONSERVANCY

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*Auchenroddan*

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FORESTRY      COMMISSION

HISTORY

of

AUCHENRODDAN      FOREST

1931 - 1951

SOUTH (SCOTLAND) CONSERVANCY

HISTORY OF AUCHENRODDAN FOREST

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## HISTORY OF AUCHENRODDAN FOREST

### GENERAL DESCRIPTION OF THE FOREST

#### Situation

The State Forest of Auchenroddan is situated in the Parish of Applegarth, Dumfriesshire, Scotland. It lies four miles north of Lockerbie and one mile east of Dinwoodie Station. The forest is one of the units within the South Conservancy of Scotland and takes its name from the farm of Auchenroddan, part of which has now become the Forester's house and holding.

#### Area and Utilisation

The forest was formerly part of Applegarth Estate, the property of Mrs. Cunningham-Jardine of Jardine Hall. It was purchased outright by the Forestry Commission in 1931 for £2,500.

The total area is 730 acres of which 713.5 acres are planted at the present time. The remaining 16.5 acres comprise a Forest Worker's Holding (at present managed by the Forester). The ground was in use as a single sheep farm at the time of acquisition but was overrun with rabbits. Surrounding Auchenroddan Cottage were 16.5 acres of arable ground and this was retained to form the Holding. Included in the planted area is one small acquired plantation of 5.0 acres which is now 37 years old.

#### Physiography

The forest is on the ridge of high ground between the River Annan on the west and the Dryfe Water on the east and overlooks the valley of Annandale.

All aspects are included in the forest but the most usual are southerly and westerly; there are no steep slopes. The elevation varies between 360 ft. in the south-west and 735 ft. in the north-east (Whitecastle Knowe). Exposure is mainly to south and west winds but the forest is sheltered from the north and east.

#### Geology and Soils

The underlying rock is Upper Silurian (Birkhill Shales). There has been much folding and the strata are very irregular. The rock can be quarried to give an inferior road metal. The soil derived from this rock

is a red loam full of rock fragments and usually freely drained. Much of the area is overlain with glacial till, giving, in places, an impeded gley soil. This occurs mainly on the lower ground, e.g. in the Cadgers Loaning part of the forest. In this area there are a few acres where a thin skin of peat has formed and there is also some peat on the flatter areas of the high ground.

### Vegetation

On the mineral soils the vegetation was mainly pasture grasses with small patches of dense bracken. On the soils derived from boulder clay Juncus articulatus and Nardus stricta were dominant. On the peaty flats the association was Calluna/Scirpus/Sphagnum with Juncus squarrosus in the wetter areas. A few thorns and whins occurred locally, mainly on the edges of streams.

### Meteorology

The climate is mild and severe frosts are unusual. The area is low enough to escape a considerable quantity of the snow which falls on the higher hills in the neighbourhood. Snow seldom lies for more than a few days. The average annual rainfall is 45 in. and the prevailing wind is south west.

### Risks

- a) Fire. The risk here is slight since the area is off the beaten track and there is no muirburning on the surrounding land.
- b) Grazing. There has been some damage in the past from roe deer and from cattle straying from the Forest Worker's Holding. Rabbits have virtually been eliminated.
- c) Game. For the first three years after planting Japanese larch was badly damaged by black game but the plants made a successful recovery.
- d) Fungi and Insects. European larch (P.32, 33) has suffered from "die-back" and has now been replaced by other species.

## Roads

An access road has been built along the right of way leading to the Sibbaldbie-Dinwoodie road. In the forest itself all-weather roads have been built leading from the perimeter of the forest to a central conversion and stacking site near the forester's house (see map). These roads have been designed to aid extraction from all compartments and to enable road metal to be quarried and transported from a small quarry on the north-east edge of the forest. No development work has been carried out on the rides other than to lay down branches and put temporary bridges across drains in order to facilitate extraction where necessary. Road work within the forest was started in F.Y.45.

## Labour

The present labour force of 12 men appears insufficient to carry out all desirable maintenance but this is because the squad is also employed to carry out work at Brownmoor (286 acres). During the war there was the usual shortage of staff but as the plantations had not reached the thinning stage and no planting work remained to be done this was not so keenly felt as in other forests. The present squad is efficient and numbers do not fluctuate very greatly. Pre-war the squad averaged 6 men and during the war the numbers dropped to 2.

## SILVICULTURE

### Preparation of Ground

The area was fenced against stock and rabbits and all rabbits were cleared from within the fence. As much ground as possible was ploughed at 5 ft. intervals with a double-furrow agricultural plough drawn by a wheeled tractor. With this equipment it was only possible to plough the drier and flatter sites. The ploughing was by contract. The planting on the ploughed ground was by notching the plants into the upturned turf of the inner furrow. At the time of planting an 18 in. slice of the furrow was cut and stamped down to exclude any air-space. The plants were notched through the turf to take advantage of the two layers of decaying vegetation. Ploughing was first started in 1931 and the ploughed ground was mostly planted with European larch and Japanese larch although it was also possible to plough some spruce ground. The establishment of the plants on this type of ploughing

was uniformly successful but as the plants grew heavier there was some tendency for them to "swing" due to wind and a considerable amount of firming up was necessary on the softer furrows. Very little beating-up was necessary after planting. The Japanese larch was severely damaged by black game in its early years and this, together with "swinging", produced many misshapen trees and it is only now that the third thinning is at hand that the plantations are showing signs of producing a good final crop. A small area (totalling approximately 2 acres) was planted experimentally with seedlings of Japanese larch, European larch, Sitka spruce and Norway spruce. These seedlings were not particularly successful and suffered badly from frost-lift and drought. The seedlings were P.32 and 33 and by F.Y. 34 the European larch and Japanese larch deaths were 80%, Sitka spruce 40% and Norway spruce 70%. The results of this experiment, as given on the Form R.6, seem at variance with the comments made during Sir Alexander Rodger's visit in 1936. (See Appendix I).

#### Choice of Species

The first block of 103.5 acres was planted in F.Y. 31 with Japanese larch, Norway spruce and Sitka spruce, following on an original site assessment which divided the forest as follows:- larches, 249 acres; spruces, 461 acres. In these areas European larch was to be used on the best sites, Japanese larch on the red mineral soil, Sitka spruce on all wet ground and Norway spruce only in frosty hollows. The peaty ground was to be left until drainage had had some ameliorating effect. This was the original choice of species laid down in the Working Plan. In the planting which followed the actual species used were as under :-

Norway spruce	265	acres
Sitka spruce	249	"
Japanese larch	91.5	"
European larch	39	"
Scots pine	47	"
Beech	1	"
Pinus contorta	1	"
Scots pine/Sitka spruce	5	"
Norway spruce/Scots pine	4	"
Sitka spruce/Japanese larch	5	"
Sitka spruce/hybrid larch	1	"

The basis for choice of species was as follows:- European larch would be planted on the best quality soils, particularly ground which had formerly been under arable cultivation and Japanese larch on the red mineral soils. These two types of ground were ploughed wherever topography allowed. Sitka spruce would be used on the wet ground, particularly on peat. A much larger proportion of Norway spruce was used on wet ground than was originally intended, because Sitka spruce was difficult to obtain from the nurseries. Scots pine was used on all heathery sites but some Sitka spruce and Norway spruce were also tried on this type of ground. A small area of one acre of Pinus contorta was planted on hard heather ground as an experiment. Beech, largely for amenity purposes, was planted on the perimeter of the forest and also in narrow belts running across the forest. The following mixtures were planted:- Sitka spruce/Scots pine; Norway spruce/Scots pine; Sitka spruce/Japanese larch and Sitka spruce/Hybrid larch. These were on heather ground where the spruces would not succeed pure.

#### Planting

a) The following spacings were employed:-

Norway spruce and Sitka spruce	5 ft. x 5 ft.
Japanese larch and European larch	5½ ft. x 5½ ft.
<u>Pinus contorta</u> and Scots pine	4½ ft. x 4½ ft.

b) The principal seed origins of the transplants used in the Auchenroddan plantings are as under:-

<u>Japanese larch</u>	Japan
<u>European larch</u>	Swiss & Tyrolean Alps, Silesia, Austria and Scotland (small quantity).
<u>Norway spruce</u>	Austria and Germany
<u>Sitka spruce</u>	Queen Charlotte Islands
<u>Scots pine</u>	East and North-East Scotland
<u>Beech</u>	Germany and Scotland
<u>Pinus contorta</u>	Shuswap, Canada.
<u>Tsuga</u>	Queen Charlotte Islands

c) Both European larch and Japanese larch were planted on ploughed ground or on turned turf. All wet ground was mounded and the plants notched through the mound. A large proportion of the hard mineral ground



was mattock planted. The worst heather ground was drained a few years prior to planting; it was then mounded and the plants were given two ounces of basic slag at the time of planting.

d) The annual rates of planting were as follows:-

F.Y. 31	103.5 acres
32	323.5 "
33	198.5 "
34	27.0 "
35	17.0 "
36	29.5 "
37	5.0 "
38	- (.5 acres replanted)
46	3.5 " + 17.5 acres replanting of failed European larch)

e) Manuring.

The Scots pine on bad heather ground was given two ounces of basic slag per plant at the time of planting.

f) The establishment of all these species, with the exception of beech, was, on the whole, good although a few small areas (totalling approximately 2 acres) of Norway spruce, planted on heather ground, went into check and have since been beaten up and replaced with Scots pine. The beech has been disappointing and is now present in a low bushy form about 2 ft. to 5 ft. high. This condition seems to be due mainly to grazing by roe deer but also to chafer attack on the roots of the trees.

#### Beating Up.

A minimum of beating up was required and the only additional drainage necessary was in the Scots pine areas (P.36) where, at the time of planting, drains were cleaned and deepened and a few new drains constructed. The establishment of plants used in beating up was good and no manuring was carried out at the time of beating up. With the exception of a few small areas of spruce on heather ground (see above) there was no change of species at the time of beating up and in most cases beating up was completed within three years of planting.

### Weeding

The removal of grazing caused a heavy growth of grass and a considerable amount of weeding was required for some years after planting. Damage from weeds was in smothering and root competition but weeding was completely successful in combating this.

### Mixtures of Species

The most successful of the mixtures is the area of Sitka spruce/Scots pine where the Sitka spruce has now been nursed up to form fine clean stems and this plot now requires a first and careful thinning to select and preserve the best stems of both species. A small area of poor Scots pine in Compartment 20 was underplanted with Tsuga heterophylla in F.Y. 35. The Tsuga has done very well and the Scots pine has recently been cut back to allow the Tsuga leaders to come through freely.

Rates of Growth

Comp.	Species	P. Year	Age	Geology and Soil	Altitude Aspect Slope Exposure	Mean Height of Dominants	Mean Annual Height Increment	Current Annual Ht. Increment during last 5 years
2	J.L.	31	20	6 in. of red loam overlying Birkhill Shales with 1 ft. of broken rock as subsoil.	a) 600 ft. b) S.W. c) Moderate d) Moderate	39 ft.	1 ft. 11 in.	2 ft.
1	S.S.	31	20	Peat from 3 in. - 1 ft. deep, overlying 1 ft. - 3 ft. of boulder clay with shale beneath.	a) 700 ft. b) S.W. c) Slight to Flat. d) Mod. - severe	32 ft.	1 ft. 7 in.	2 ft.
23	S.S.	33	18	Heavy clay soil derived from deep boulder clay and in parts a thin layer of peat present. Heavy agricultural soil.	a) 400 ft. b) S.W. c) Flat d) Sheltered	38 ft.	2 ft. 1 in.	2 ft. 3 in.
4	N.S.	31	20	Mainly weathered boulder clay merging with shale soil on the slopes and deeper clay on the flat.	a) 500 ft. b) S.W. c) Flat to slight d) Sheltered - slight	36 ft.	1 ft. 10 in.	2 ft.

### Past Treatment of Established Plantations

With the exception of the European larch areas, work has been carried out in a routine manner as plantations became due for various operations.

Brashing was commenced in F.Y.41 in the Japanese larch areas, in F.Y.49 in the Sitka spruce and in F.Y.49 in the Norway spruce. To date 89 acres of Japanese larch, 135 acres of Sitka spruce and 80 acres of Norway spruce have been brashed and the annual brashing rate is now 50 acres. Brashing has been carried out on a "selection" basis which leaves 30% -50% of the crop unbrashed and only the better stems are treated.

Pruning and cleaning operations have not been carried out at all.

Thinning was commenced in F.Y.41 and the current plan of operations gives a proposed thinning programme of 200 acres for F.Y.52. Thinning produce has been sold for boxwood, pit props, fencing posts, strainers, rustic wood, hay tripods and firewood. Norway spruce is usually thinned in December and the tops sold for Christmas trees. There is a ready market for all types of produce and although conversion work has, up to date, been carried out within the forest there is now a possibility that thinnings will be sold unconverted at ridside. In addition to this it is hoped to sell a large area of thinnings standing. The table given below shows the thinning position to date. The present intervals between thinnings are:- Japanese larch - 3 years; Sitka spruce - 3 years; Norway spruce - 4 years.

All the European larch areas, (P.32 and 33) were successfully established and showed normal growth until the age of six to nine years when, at heights of 10 ft. - 15 ft. the trees were badly affected by "die-back". This was so uniformly bad as to necessitate the complete cutting out of the European larch over nearly all the area and its replacement by other species (Norway spruce and Sitka spruce). The heavy grass growth present on these areas made the replanting difficult and the beating up and weeding have been heavy. This replanting was carried out in F.Y.46 and in the few areas where beating up is still considered to be necessary in F.Y.52 the species to be used are sycamore, Tsuga, Abies grandis and Norway spruce.

## Thinning

Year	Area (acres)	Total Volume	Volume per Acre
1941	16.0 )	No volumes recorded.	Light thinning
42	10.5 )	to remove "wolf" trees.	
43	32.0	4,000 cu. ft.	125 cu. ft.
44	24.5	1,715 "	70 "
45	36.7	3,828 "	104 "
46	48.0	5,520 "	115 "
47	35.25	2,962 "	84 "
48	30.25	5,739 "	189 "
49	68.0	22,897 "	337 "
50	46.75	22,917 "	490 "
51	14.75	5,545 "	376 "
52	200.0 (proposed)		

## Conclusions

Auchenroddan is a good example of a small, compact and successful plantation established on former grazing ground. Its greatest interest lies in the choice of species and it is readily apparent that the three species, Norway spruce, Sitka spruce and Japanese larch are proving to be very promising on their respective sites. Norway spruce in particular is doing very well and it would appear that its use might have been extended to cover a good proportion of the ground now carrying Sitka spruce. Ground which was allocated to European larch is probably of too good a quality and should now produce good Norway spruce, although use might well have been made of hardwoods such as sycamore and, in places, oak to replace the failed European larch. The Scots pine throughout the forest displays the symptoms of poor and unhealthy growth which is typical of most of the young Scots pine plantations in Dumfriesshire. The relatively good growth of Pinus contorta and the successful example of underplanting Scots pine with Tsuga are pointers to the treatment which may be necessary for the improvement of the present Scots pine areas. It is probable that interplanting of the Scots pine with Sitka spruce might be the best way of getting a good crop on the ground.

By its ready accessibility and proximity to good markets, Auchenroddan is a forest which, now that it is in the production stage, should show a rapid increase in returns from the sale of forest produce. The area and volume of thinnings are now increasing rapidly and will soon reach a stage where it will be necessary to carry out the sale of thinnings standing.



The steady labour position and variety of work help to make management easier and Auchenroddan has become a model of successful afforestation.

APPENDIX I

The following inspections of Auchenroddan are recorded:-

<u>Date</u>	<u>Inspecting Officer</u>	<u>Comments</u>
6/10/31	Technical Commissioner	Successful planting of Japanese larch on ploughed ground.
15/6/32	Divisional Officer, S.W.	Black game damaging Japanese larch. Seedlings of Japanese larch, European larch and Norway spruce very successful.
28/7/32	Forestry Commissioners	Successful planting on ploughed ground.
31/8/33	Divisional Officer, S.W.	Beech not thriving.
12/9/36	Sir Alexander Rodger, Forestry Commissioner.	Good Japanese larch despite black game damage. Success of seedling plantations.
6/5/44	Chairman	Good thinning in Japanese larch. Good Norway spruce. Poor <u>Pinus contorta</u> due to deer damage. Good Scots pine/Sitka spruce mixture.
16/3/48	Conservator (S)	Poor quality of Norway spruce on areas of failed European larch. Inspection principally of thinning and roads.
26/10/49	State Forests Officer (Mr. Fossey)	Thinning too light originally - now satisfactory.
7/8/50	Director (S)	Thinning in F.Y. 50 too heavy.
24/5/51	Conservator (S)	Thinning satisfactory. Difficulty in failed European larch areas in getting Norway spruce and Sitka spruce to grow possibly due to intense root competition from heavy grass growth. Good recovery of <u>Pinus contorta</u> from early deer damage.

APPENDIX II

Supervision

Conservators

1946 - 47	J.R. Thom
1947 (March to May)	F.W.A. Oliver
1947 - 51	J.R. Thom
1951 to date	J.A.B. Macdonald

Divisional Officers

1931 - 34	J.M. Murray
1934 - 38	O.J. Sangar
1938 - 39	F.W.A. Oliver
1939 - 42	A. Watt
1942 - 45	J.R. Thom

State Forests Officers

1948 - 51	R.E. Fossey
1951 to date	W.N. Gibson

District Officers

1931 - 37	J.M. Macdonald
1937 - 38	J.S.R. Chard
1938 - 39	R.F. Wood
1939 - 43	No District Officer
1943 - 50	W.B. Sutherland
1950 - 51	W.N. Gibson
1952 - to date	J.D. MacNab

Foresters

1931 - 38	P. Brown
1938 - 51	J. Hunter
1951 - (October to December)	B. Patterson
1951 - (December) to date	J. Parkinson



Auchenroddan



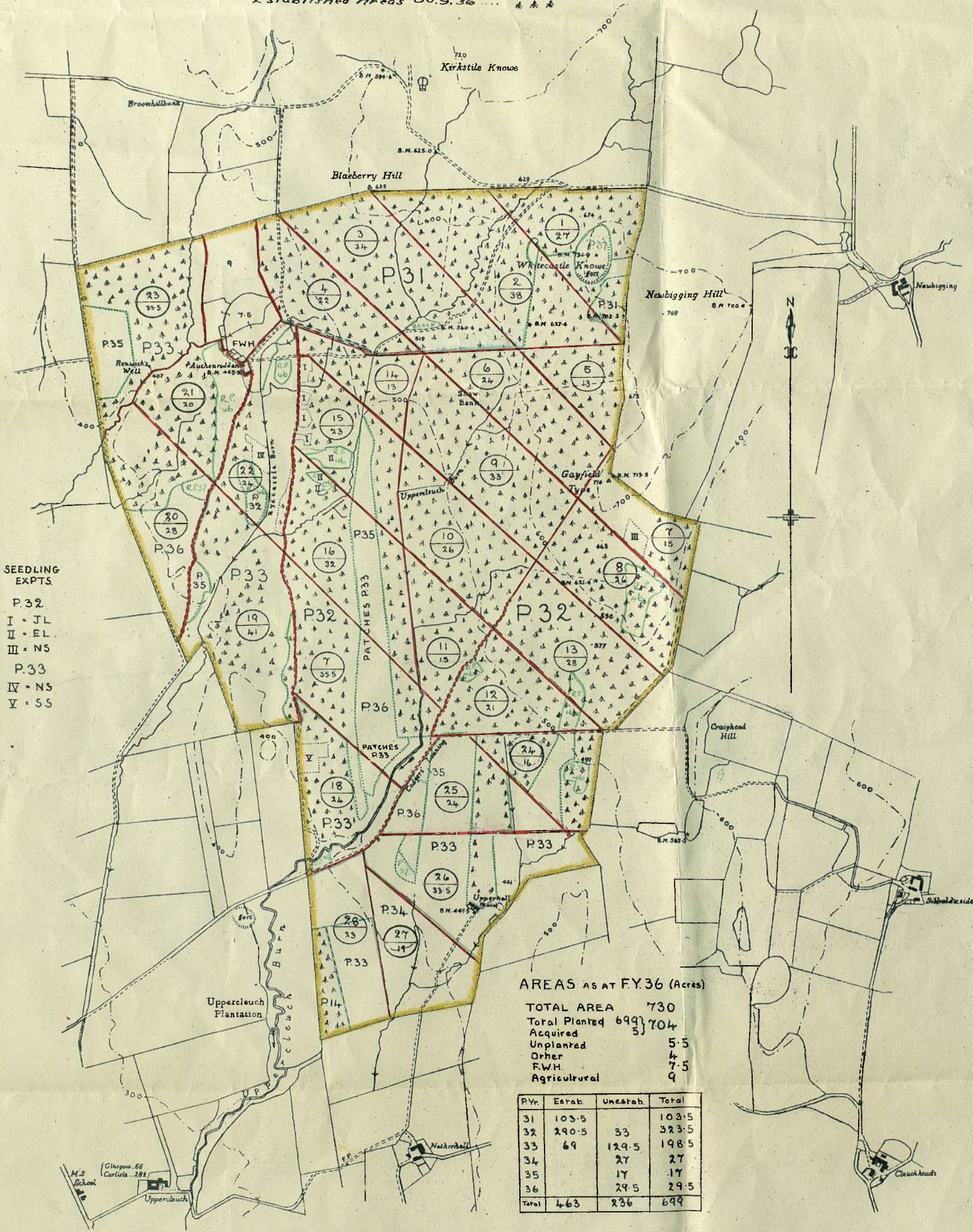
# AUCHENRODDAN FOREST

COUNTY OF DUMFRIES  
 APPLGARTH Ph.

Survey Revised to F.Y. 36. Based on O.S. Edition of 1900

Dumfries-shire Sheets 34 S.W. and 43 N.W.

Established Areas 30.9.36



SEEDLING  
 EXPTS.  
 P.32  
 I - J.L.  
 II - E.L.  
 III - N.S.  
 P.33  
 IV - N.S.  
 V - S.S.

AREAS AS AT F.Y.36 (Acres)

TOTAL AREA	730
Total Planted	699 704
Acquired	5 5
Unplanted	4
Other	7 5
F.W.H.	9
Agricultural	

P.Yr.	Estab.	Unestab.	Total
31	103.5		103.5
32	290.5	33	323.5
33	69	129.5	198.5
34		27	27
35		17	17
36		29.5	29.5
Total	463	236	699

Scale - Six Inches to One Statute Mile or 880 Feet to One Inch - 1000

