

REVISED NOVEMBER 1983
NORTH SCOTLAND CONSERVANCY INSTRUCTION NO. 13
CHOICE OF SPECIES FOR PLANTING

1. POLICY

1.1 For normal planting, to use economically productive species, pure or in mixture; the species planted must be suited to the site and selected from the following:-

Scots pine
Lodgepole pine
Sitka spruce
Norway spruce
Japanese larch
Douglas fir
Hybrid larch

1.2 For visual amenity, to supplement the use of the above species with other conifers and broadleaved species which are known to grow satisfactorily in the Conservancy. When using broadleaves, preference will be given to indigenous species.

2. RESPONSIBILITIES

2.1 To meet Forest District Managers' plant demands Assistant Conservator (FM) will provide planting stock in appropriate quantity and of the highest genetic quality available.

2.2 Forest District Managers will ensure by instruction and periodic field inspections that Forest Managers comply with the provisions of this Instruction.

3. NOTES ON THE
MAIN SPECIES

3.1. Scots pine

3.1.1. Grown Pure

The use of Scots pine in the Conservancy declined in the two decades to 1980 mainly because of its reputation as a poor volume producer relative to Lodgepole pine on similar sites. Scots pine seed is now obtained from trees in seed orchards and seed stands of high phenotypic vigour and form. It is a species which will grow satisfactorily over a wide range of sites but it is particularly well suited to the heathlands in the eastern parts of the Conservancy. On these sites Scots pine will be the first choice and will only be replaced as the main species by Lodgepole pine where exposure and/or deep, infertile peats are factors affecting species choice.

Standard nursery stock will be used mainly, but for limited use on sheltered sites in the western forests, the Achnashellach or Shiedaig origins are to be preferred. For areas north of Lairg these origins will invariably be used. When it is proposed to regenerate Old Caledonian Pine stands, plants raised from seed from the same locality will be used. Where this is not practicable, planting stock should be raised from the native pinewood areas of origin listed in the Native Pinewoods Grants Leaflet.

3.1.2. Grown in Mixture

Scots pine may also be used as a nurse for Sitka spruce on suitable mineral soils (see para 3.3 and Appendix, para 4.4).

3.2 Lodgepole pine

3.2.1. Grown pure

This species grows well on infertile sites with relatively low fertiliser inputs and has the ability to lower the water table and improve the physical structure of peats. It is, however becoming increasingly apparent that it is very susceptible to severe damage by deer and insects and it is now realised that establishment of pure Lodgepole pine should be on a much smaller scale than in the recent past.

Lodgepole pine will therefore be planted pure only in soils which are obviously of very low nutritional status as indicated by total lack of flushing or are dry ridge sites or in obvious frost hollows.

The selection of provenances is covered in :
Conservancy Instruction No. 5.

3.2.2. Grown in Mixture

Alaskan, North Coastal and (in the absence of adequate stocks of either) Skeena provenances may be used as nurses for Sitka spruce on suitable sites. (See para 3.3). In this role the species mixture eliminates the need for nitrogen inputs and herbicides. (see Appendix).

3.3 Sitka spruce

3.3.1. Grown Pure

Sitka spruce should be established wherever ground conditions are capable of growing it with economical herbicide and fertiliser inputs. Sites for pure Sitka spruce will be fertile, well flushed and, as a result, will often be dominated by, or show a significant presence of molinia; they will be found on brown earths, surface water gleys, flushed peaty gleys, and well flushed deep peats.

3.3.2. Grown in Mixture

Research has shown that the range of Sitka spruce can be extended into flushed and unflushed peaty gleys and deep peats when it is grown in mixture with suitable provenances of Lodgepole pine, larch species, or on a very limited scale Scots pine. Such sites would include the more fertile portions of unflushed peaty gleys, and peaty ironpans and podzols and deep peats. (See Appendix).

3.4

The preferred seed origin for N(S) is Queen Charlotte Island (QCI).

3.5. Norway spruce

The use of this species will be confined to rich sites viz. brown earths, surface water gleys and flushed molinia peats where the possibility of frost damage is a factor. These sites will mostly be in valley bottoms.

Standard FC nursery stock will be used.

3.6 Japanese larch

Japanese larch will continue to be used in establishing fire breaks although the traditional planting of rectilinear fire breaks has been replaced by treatment more sympathetic to good landscape design.

This species has a limited value as a timber tree and its use should be confined to amenity and fire break planting although Hybrid larch is to be preferred if available. Japanese larch can be used on dry basalt soils and on mineral soils and shallow peaty gleys in the Central Highlands. There is evidence that its performance can be superior to that of Lodgepole pine on such sites. It can be used in moderate exposure but badly drained sites and frost hollows should be avoided.

Grown in Mixture

Larch species have a significant nursing effect on SS but should be restricted to an admixture of about 15% of the LP element of SS/LP mix (see Appendix para 4.5).

The recommended origins are Nagano or Hokkaido.

3.7 Hybrid larch

3.7.1. Grown Pure

Hybrid larch will grow successfully on a variety of sites including flushed peats, peaty podsoles, podsoles, etc. and brown earths. In strict NDR terms the profitability of the species is comparable to that of Sitka spruce but it is of limited timber sale value and its use should be confined to the establishment of minor, well sited amenity stands or as a substitute for Scots or Lodgepole pine on the sites suggested for Japanese larch in 3.5 above. Use of this species is also indicated on heather invasive basalt soils.

3.7.2. Grown in Mixture

When grown in mixture with Sitka spruce on the less fertile sites described in para 3.3. above, Hybrid larch has the ability to prevent the onset of N deficiency. Its effect on soil structure is less marked than with Lodgepole pine but nevertheless it is considered that there may be a place for this species in combination with Lodgepole pine as a nurse for Sitka spruce. (See Appendix para 4.4.).

At present stocks of Hybrid larch are not plentiful and therefore they should be reserved for pure planting sites. Standard FC nursery stock will be used.

3.8 Douglas fir

Much Douglas fir was planted on the creep soils of the Great Glen in the inter-war period - with excellent results; the species went out of fashion in the 1950s but its use since then has increased slightly. There is a place in our silviculture for the species. There are two pre-requisites for successful growth - reasonable shelter and a relatively rich freely drained soil. Slopes of brown earths and podsolised brown earths are ideal, but the species can be extended on to the richer podsoles and, with complete ploughing, on to poorer podsoles as long as long as the drainage is not inhibited.

The preferred origins are NW Washington ie. Elma or Darrington.

4. PLANTING PATTERNS FOR MIXTURES

The aim is to achieve the maximum nursing effect by using intimate mixtures of Sitka spruce and nurse species while at the same time retaining simplicity of pattern in order to disrupt planting rhythm as little as possible. Therefore a standard 50:50 mixture will be adopted using alternate groups of three along rows and aiming at a staggered pattern between rows.

(See Appendix para 4.2)

This Instruction cancels Conservancy Instruction No 5 February 1983 copies of which should be destroyed.

R G Cathie
Conservator
November 1983

Distribution: Conservator
 Asst. Cons. FM
 Asst. Cons. H & M
 Forest District Managers
 FM Function Managers
 FMD Headquarters
 Principal Silviculturist (N) NRS
c.c. Mr Waugh Ploughing Forester
 Mr Hinde, Conservation Forester
 Mr Munro, Acquisition Officer

CONSERVANCY INSTRUCTION NO. 13

SS MIXTURES

APPENDIX

North (Scotland) Conservancy. Silvicultural prescription for SS mixtures on flushed and unflushed peaty gleys and deep peats.

1. Research evidence confirms that on flushed and unflushed peaty gleys and deep peats on the Moine and ORS, SS grown in mixture with LP or larch and subject to a standard P/PK fertiliser regime is able to maintain higher nitrogen status and productivity than pure SS and that its estimated financial yield potential exceeds that of pure LP.

Therefore the prime objective on such sites will be to secure a final crop of SS grown in a self thinning mixture with LP or LP/larch.

- 1.1 The Elevation Zone and Windthrow Hazard Classification suggest that the crops will be felled at a top height of 18m and will in the main be managed on a non-thin regime.
2. Site Types - Flushed - Unflushed peaty gleys and deep peats of the Moine Schists and Old Red Sandstone.

Elevation Zones

Lower

O - 180m N (Caithness)

Upper

Above 110m N
Above 180m C
Above 270m E

N - North
C - Central
E - East

3. Site Preparation

Plough with DMB Ploughs at 2m spacing.

Plough types D75/-/t (Research Info Note 16/76Silv)
 D60/-/t (North Region W/Study Team Report No. 60).
Drain - As per N(S) Conservancy Inst. No. 2

4. Species Selection

SS (QCI) is confirmed as the main species and will be planted in mixture with a slow growing provenance of LP capable of providing shelter and vegetation suppression in the early stages and staying in competition with the SS to around year 16 onwards at which stage the benefits from the mixture effect become apparent and the SS begins to dominate the nurse crop.

- 4.1 Spacing

2500 plants/Nett ha. equivalent to 2m x 2m spacing.

4.2 Non thin regime. Self thinning mixture

SS (QCI) in 3:3 mixture with LP along the ploughed ridge - ie a standard 50:50 mixture using alternate groups of three along rows and aiming at a staggered pattern between rows.

4.3 LP provenances

ALP is the first choice in non thin mixtures. North Coastal and Skeena River are acceptable options.

4.4 On the better sites found within the groups described in para 2 there may be limited opportunities for a thinning regime and mixtures should be row rather than intimate. On such sites SP should be considered as an alternative nurse to ALP and SP (Achnashellach) should be used if available.

4.5 Larch species have a significant nursing effect on SS on the sites covered but because of the generally poor form associated with wetter sites and the greater possibility of severe mammal damage this species will be restricted to a 15% random mix with the LP element - the larch being mixed through the LP bundles in the nursery.

5. Fertiliser Regime - Main Crop Species SS in mixture, LP pure.

Soil Type	At Planting	Yr 8	Yr 16
Flushed and unflushed peaty gleys and deep peats	P	PK	PK

5.1 It has been assumed for the investment model that the PK applied in year 16 will be necessary but it is essential that crops on these sites be regularly inspected up to full canopy closure to monitor the nutrient status and the need for fertiliser input. (See the appropriate sections of SM33 and North Scotland Conservancy Instruction No. 3).

November 1983