

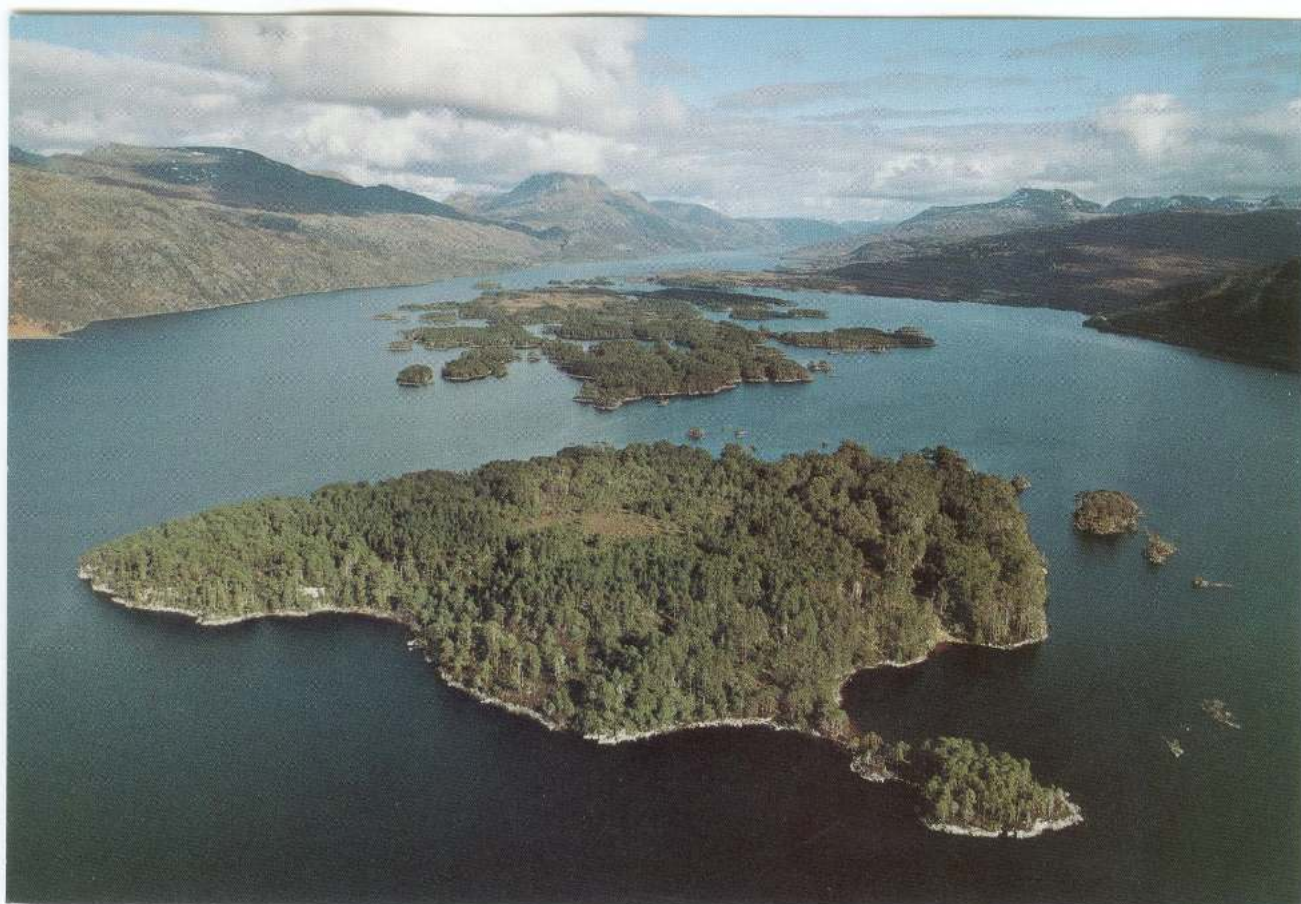
INVERNESS FOREST DISTRICT
EILEAN RUARIDH MOR LOCH MAREE ISLANDS

**SSSI
and
NATIVE CALEDONIAN PINWOOD PLAN**

COMPT 5319

GRID REF NG897734

1997- 2002



Forest Enterprise
Millyard
Smithton
Inverness IV12 5RF
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Eilean Ruaridh Mor from Slattadale Forest



The landing place Eilean Ruaridh Mor 1997

INVERNESS FOREST DISTRICT
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LOCH MAREE ISLANDS
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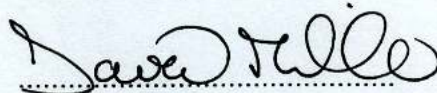
GRID REF NG897734

1997- 2002

Prepared by: ..M.D. CANHAM.....

Chief Ranger
Forest Enterprise

Agreed by:



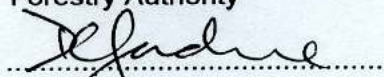
Reserves Manager
Scottish Natural Heritage

Agreed by:



Conservator
Forestry Authority

Approved by:



District Manager Inverness F.D.
Forest Enterprise

Distribution of approved Plan:

Regional Director
FDM
ALA
ACE
SNH
FA

Revision date:-

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1. INTRODUCTION

This is a document which combines the SSSI and the Native Caledonian Pinewood Plans for Eilean Ruairidh Mor, Loch Maree.

1.1 Location, area and access

Eilean Ruairidh Mor is one of the 66 Islands which make up the Loch Maree Islands SSSI and National Nature Reserve (NNR). It is located at the north west end of the Island group within the loch and is approximately 43 ha in area.

Access to the Loch Maree Islands is by private boat. Access by the general public is not encouraged for the following reasons. The possible disturbance to breeding Black-throated Divers and the risk of accidental fire and other disturbance to the Scots pine woodland.

A 1:10 000 scale map of the SSSI indicating access routes is provided at appendix 3.1

1.2 The forest in context

The woodland is one of a group of native pinewoods in Wester Ross which are genetically distinct from the other Scottish pinewoods. These woods have retained a high degree of genetic variation and have affinities with the pinewoods of Spain and southern France.

The woodland on Eilean Ruairidh Mor is included as part of the 181 ha of Caledonian Pinewood of the loch Maree Islands entry in the Forestry Commissions 'Caledonian Pinewood Inventory'. Eilean Ruairidh Mor accounts for 43ha of this area. According to the inventory the fragmented remnants in the north west highlands of Scotland now only occupy around 1% of this former range. Eilean Ruairidh Mor represents one of the larger remnants at full forest cover.

There is relatively little regeneration on Eilean Ruairidh Mor because of this forest cover; and the browsing by deer reduces it further in the few small open areas.

Biochemical studies of 151 and 62 trees from Eilean Ruairidh Mor (Forrest 1980) indicate that genetically the trees are typical of the north west highlands and have fewer rare types than other pine woods in this region. Pollen studies from the loch sediments and from basins on the islands provides a valuable record of Flandrian vegetation history and suggest that the decline in pine abundance after about 4250 yr BP was in response to climatic change.

The relatively undisturbed nature and valuable genetic pedigree mean that in extent Eilean Ruairidh Mor is a rare example of its type in the Highlands.

1.3 Geology, Climate, soils and topography:

Geology:

The underlying rock is pre-Cambrian Torridonian sandstone of the Applecross group.

Climate: The climate is typical of the north west highlands with high rainfall, (mean annual rainfall for the Loch Maree Islands of 1500mm.) mild winters and cool summers. January mean 3.3°C and a July mean of 13.3°C. (Steven & Carlisle 1959)

Soils

The soils on the more freely drained knolls and ridges are sands and gravels often dark coloured and in places heavily leached; there may be a compacted layer in the B horizon.

Parts of the wood are poorly drained and covered with peat of varying depths.

Topography The Island reaches a height of 110m with a small un-wooded area towards the summit.

On the south to south-west side of the Island the ground drops away quickly in places towards the shoreline forming small escarpments. In other areas the slope is much reduced from the wooded interior to the typically rocky shore line.

1.4 Site history (Ownership and management)

There is little documented history for the Loch Maree Islands but the first records come from brief comments by Thomas Pennant during his 'tour' of Scotland in 1772. Later the area is noted for its native pinewoods in the first (1792) and second (1836) statistical accounts of Scotland. More recently Harvie-Brown (1904) makes reference to the Islands as a breeding site for Ospreys. Eilean Ruairidh Mor was purchased by the Forestry Commission on the 9th November 1921 from Sir Kenneth John Mackenzie, Slattadale and is now managed by Forest Enterprise and SNH. Other Islands in the SSSI are owned by Gairloch and Conon estates.

1.5 Designations

Most of the Islands came under an Nature reserve agreement (NRA) in 1973 followed by SSSI designation in 1974.

Eilean Ruairidh Mor had an NRA concluded in 1977. The NRA expires on 15.5.2007.

The whole SSSI site is a grade 1 Nature Conservation Review Site (1977) on account of its woodland.

The Loch Maree SSSI (including Loch Maree Islands NNR) was designated a special protection area (SPA) (and RAMSAR site) in 1993 on account of its breeding Black throated diver population which account for c. 6% of the EC total. The whole of the SSSI and NNR area is also included within the large Loch Maree complex pSAC site.

Eilean Ruairidh Mor lies within the Wester Ross National Scenic area.

1.6 Forest cover and condition

The pinewood of Eilean Ruairidh Mor is ranked as class 2 by the the Forestry Commission's Native pinewood condition classification in 1997.(See Forest Enterprise's GB plan for Native Caledonian Pinewood on Forestry Commission land.)

1.6.1 Summary of database listing and map of condition criteria

Summary of SCDB Listing

ROTN	MIXT	LEGL	CNTY	ALTD	WHCL
1	P	F	3	03	

STOREY	SPIS	PLYR	YLDC	PROD	UNPR
1 SP		1880	6	34.00	9.00

FOREST	GEOG	CPMT	SCPT	COMP	LUSE
517	5	5319 A		1 PHF	

PFTB	GridReference
	14 NG897733

For Map see Appendix 3.1

1.6.2 Description and location of other monitoring data and records

Core Record: The core record will consist of the main elements proposed by Peterkin (1994) and contained within the Forest Enterprise GB plan for Native Caledonian Pinewood on Forestry Commission Land. On Eilean Ruairidh Mor this will consist of the following elements:

- i Forest Condition Class - The Pinewood will be surveyed on a periodic basis to assess the condition of the woodland. Condition will be measured in line with Appendix II of the FE GB Plan for Native Caledonian Pinewood on Forestry Commission land. Surveys of condition will be carried out as detailed in Appendix 3.5
- ii Fixed point Photography- Two photographs (one parallel the other perpendicular) will be taken by SNH along transect 3 at 30m intervals (These intervals to be marked with small wooden posts). Photography to start in 1998 and continue at 5 year intervals as detailed in Appendix 3.5
- iii Aerial Photographs- Photocopies of available aerial photographs can be found in Appendix 3.6. These will be added to as the opportunity arises.
- iv Event Record- Forest Enterprise will maintain a record of all major events which have an effect on the pinewood.
- v Habitat Map - The Island is due to have an updated NVC survey carried out by SNH a copy of which will be included in Appendix 3.6
- vi Grazing Assessments- Three Deer dung transects one of which (transect 3) doubles as a permanent woodland monitoring transect have been established (see table and map in Appendix 3.6)
- vii Additional recording- Any records from other types of surveys and monitoring will be stored as part of the biological record of the Islands Pinewood. A summary of any survey work will be incorporated in the core record.
Various other existing biological records are kept at the SNH office. Kinlochewe.

1.7 Flora and Fauna

Eilean Ruairidh Mor is one of the three largest Islands in the loch which support one of the least disturbed remnants of native pine woodland in Scotland.

The Loch and Islands provide breeding habitat for a range of nationally important plants, animals and birds.

1.7.1 Description and rare species

The vegetation of the islands comprises largely Scots pine woodland with a small mire community. Upright juniper and Holly are more abundant than in many other native pinewoods. The pine woodland has a varied age structure with larger mature trees within a matrix of younger trees. Dead trees both standing and fallen are common in places. There are very few deciduous trees although the uncommon rock whitebeam (*Sorbus rupicola*) occurs locally on the crags to the north west of the Island. In the wettest areas within the woodland there are small-scale examples of Scandinavian type 'bog forest'. The woodland ground flora is more typical of the pinewoods of central and eastern Scotland with drier areas dominated by blaeberry (*Vaccinium myrtillus*).

Birds: The loch contains the territories of 10 pairs of black throated divers (*Garvia arctica*) with the potential of 6.6% of the British breeding population. This is the largest breeding

concentration of this species in Britain. Loch Maree is the only site in Britain where great northern divers (*Gavia immer*) have been recorded as having bred (1970).

Invertebrates: The native pinewood, the lochans and fens on the islands and the shingle shores of the loch support diverse insect communities which include four Red Data Book species.

1.7.2 Summary of any vegetation surveys

The Pinewood areas are described under the NVC as W18d. The ombrogenous mire is mainly restricted to the three largest Islands including Eilean Ruairidh Mor and is mainly M17 *Scirpus cespitosum-Eriophorum vaginatum* blanket mire although a NVC survey in 1995 has mapped the mire on Eilean Ruairidh Mor as M19a.

1.7.3 Summary of deer population data

During a visit on 22/4/97 although no deer were seen, data from dung counts suggested deer densities of between 10 and 16 deer / Km² (with 80% confidence levels)

1.7.4 Description and location of any other monitoring data and records

Files containing species lists, surveys of the flora etc, are held by the SNH Office Kinlochewe and the Forest Enterprise, Inverness Forest District Office.

1.8 Current recreation provisions

The loch and Islands are of considerable interest to the general public and can be seen from the main highway and surrounding hills. Offsite provision for access and recreation is provided at the F.E. car park at Slattadale. Interpretation for the loch and Islands will be developed by SNH and FE.

There are no established public rights of access to the loch and Islands.

Access to the Islands is not encouraged by SNH under the NRAs owing to the threat of disturbance to breeding Black-throated divers, risk of accidental fire and damage to the little disturbed island habitats.

1.9 Other land uses (Leases, wayleaves and sporting)

The FE section of the SSSI is held by feu, and the shooting rights are held by SNH, but both SNH and F.E may control some specified non protected species.

There are no other land uses.

1.10 Summary of site factors that will influence management

The main nature conservation interest within the FE part of the SSSI is the Semi natural Scots pine dominated woodland because of its distinct genetic make-up, shared with only a few other sites in Wester Ross. The whole woodland/Mire complex qualifies as a priority habitat 'Caledonian forest' under the EC habitats and Species directive and is of International importance.

There is limited historical evidence of significant anthropogenic disturbance to the woodland and mires of the SSSI but there is some evidence of past disturbance on Eilean Ruairidh Mor where a little tree planting using local origin material may have been carried out.

In the more recent past there has been some limited invasion of Western red cedar *Thuja plicata* Sitka spruce *Picea sitchensis* and Rhododendron *Rhododendron ponticum* probably originates from the F.E. plantings at Slattadale.

Because of its relatively undisturbed nature and large area of tree cover, a minimum intervention policy has been agreed by FE and SNH.

2. MANAGEMENT

2.1 Aims and objectives

The main objective of management is to maintain and protect the ancient Semi-natural pine wood and associated communities and to ensure that any grazing by deer is kept to a level consistent with maintaining the ground flora and allowing sufficient regeneration of the pine and other native tree species present.

A general management policy of minimum intervention will be adopted as to maintain the unique woodland gene pool and the undisturbed nature of the Island.

Regular management will be restricted to site monitoring, Deer management and removal of exotic species as detailed below.

Short term (5 year)

- a) Designate Eilean Ruaridh Mor as a Caledonian Forest Reserve during 1998
- b) During the period 1997-2002 FE and SNH aim to maintain and monitor existing deer dung transects.
- c) To Implement a strategy for monitoring the natural woodland processes (see appendix 3.6)
- d) To maintain close liaison between Forest Enterprise and Scottish Natural Heritage on all matters relating to the Island.

Medium term (20 year)

Deer Management

Deer numbers on Eilean Ruaridh Mor will be maintained at a density consistent with achieving regeneration of semi natural Scots Pine, Juniper and other vegetation associated with native pine woods.

Deer management will need to be a co-ordinated strategy involving other parties with responsibilities within the SSSI, as deer are not confined to any particular Island in the complex and should be viewed as one population throughout the SSSI for management purposes.

Rhododendron and non native Conifer Control

No systematic management is planned to control Rhododendron and non native Conifers but any seedlings will be removed if found during routine visits. If unacceptable levels of exotic trees and or shrubs are found to have become established in the future then the appropriate management will be undertaken to control them.

Long term (100 year)

To achieve a condition score of 1(See Appendix 3.7) for the ancient Semi-natural pine wood and maintain and enhance the associated communities.

2.2 Summary targets by condition criteria

A condition score of 2 has been assigned to the pine woods at present . A condition score of 1 will be the long-term target.

2.3 Work methods

Any Rhododendron and non native Conifers will be pulled or dug up during routine visits.

Deer culls will be carried out on the Loch Maree Islands by staff from SNH, FE and Gairloch and Conon estates. These culls will be based upon data from the dung transects mentioned below and any other data from the Forestry Commission's Deer Management Package.

2.4 Management prescription by treatment area (zones)

The Island nature of Eilean Ruaridh Mor and its uniform nature mean it will be considered as one treatment area for management purposes. The main management policy will be one of minimum intervention.

Management proposals which aim to maintain the nature conservation value of the site are detailed below.

Positive management will be undertaken to reduce deer grazing pressure and maintain this at a low level. Deer densities of 3 or less deer per 100 ha will be aimed for. No active management other than that listed at 2.3 below will be undertaken to achieve a condition score of 1. It is expected that a score of 1 will be achieved in the long term by natural processes.

2.6 Monitoring strategy and report

A joint monitoring programme between SNH and FE will be undertaken to detect any changes as a result of natural woodland processes, particularly these changes associated with areas of windthrow on Eilean Ruaridh Mor.

Dung transect will be monitored on Eilean Ruaridh Mor to help determine the Deer density and determine the cull as prescribed in the Forestry Commissions Deer management package.

These transects have been established and are located as shown on the map in appendix 3.6.

Sample plots will be established in areas of young regeneration, whereby annual inspections will indicate the level of deer grazing.

Liaison

Forest Enterprise and Scottish Natural Heritage will liaise through at least one annual meeting to be held in April each year, at which at least two representatives of each organisation are to be present.

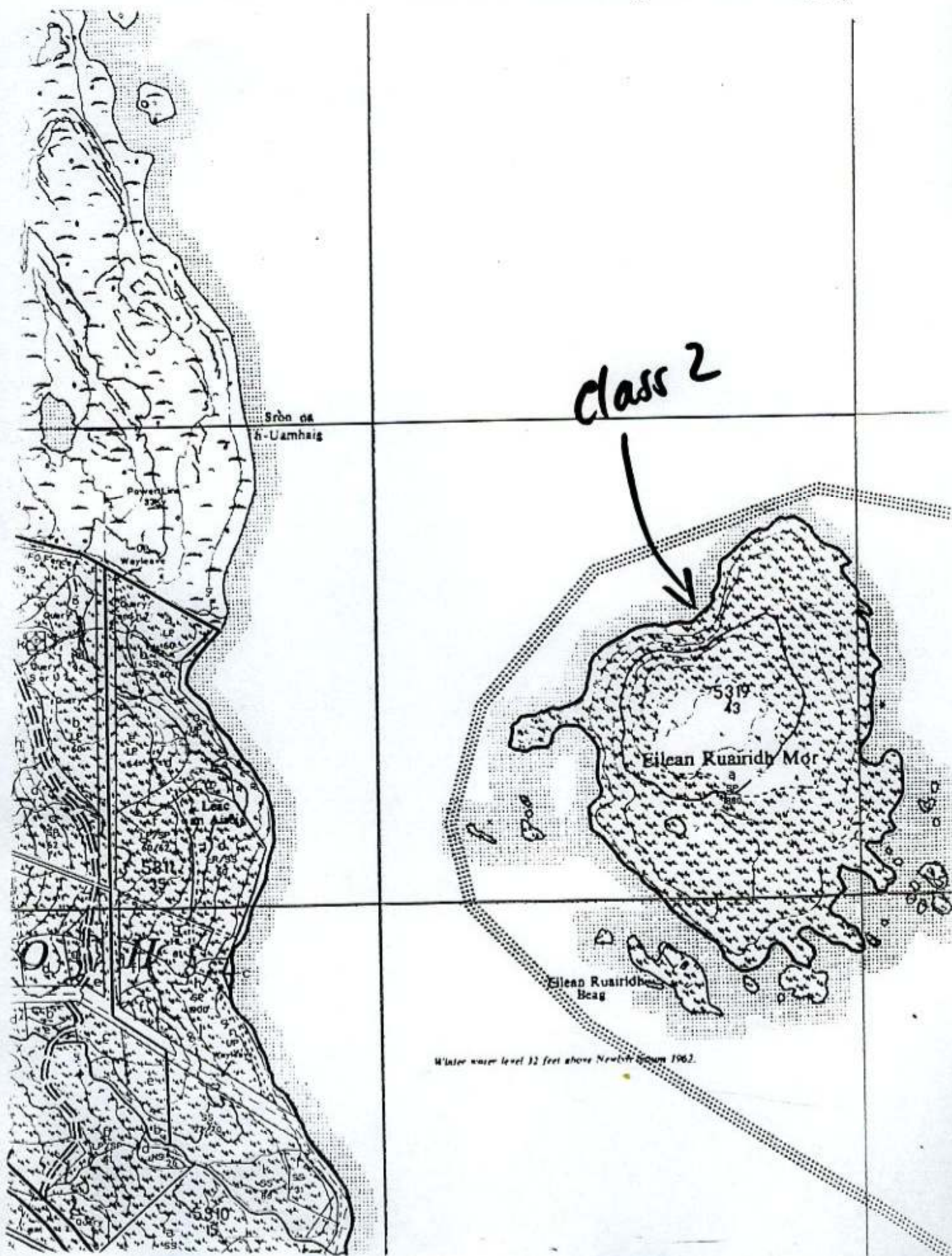
2.7 Recreation and interpretation strategy

Recreation activities will not be encouraged within the SSSI

Forest Enterprise and Scottish Natural Heritage will liaise to produce coherent and effective interpretation of the special interests of the Loch Maree Islands and the adjacent loch. This interpretation will be situated at the Forest Enterprise car park at Slattadale and will give information about the Caledonian Forest Reserve on Eilean Ruaridh Mor.

2.8 Finance (Income and expenditure) 4 year business plan

A nominal amount of £200 per annum will be budgeted to cover the costs of management as detailed at section 2.4 above



LOCH MAREE ISLANDS SITE OF SPECIAL SCIENTIFIC INTEREST
Ross and Cromarty District, Highland Region

PLANNING AUTHORITY: Highland Region

File Reference:

NATIONAL GRID REFERENCE: NH 919722

O.S. 1:50,000 Sheet No: 19
1:25,000 Sheet No: NH 68

AREA: 200 Hectares (494 Acres)

DESCRIPTION

Biology

The three large islands and numerous smaller islets in Loch Maree support one of the best remaining fragments of native pine in Scotland. Like the nearby Fionn Loch Islands the protection afforded by the water has enabled the survival of woodland and related communities in a relatively intact state.

Woodland

The islands are relatively well wooded with Scots pine strongly dominant. The trees form a mosaic of ages and sizes which is partly related to soil conditions. Where peat forms a substrate, and particularly in wetter areas, growth is checked and locally trees give way completely to open, raised bog communities.

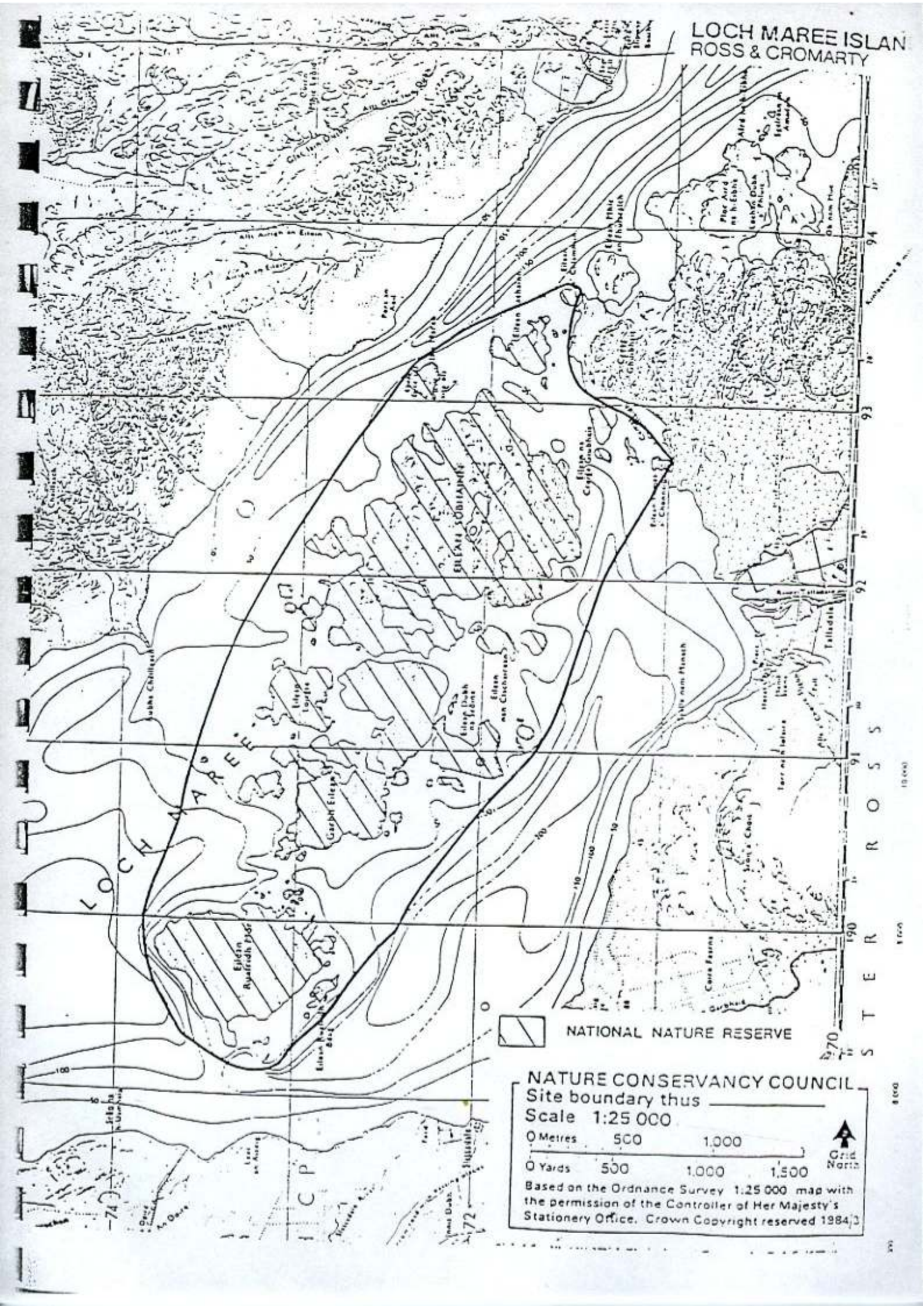
The ground flora is typical of western pinewood, though of major interest here is the presence of large juniper bushes as a major constituent of the flora. This is the only pinewood in Wester Ross where this occurs. The bog areas are dominated by a typical acid flora, but of particular interest is the presence of the uncommon plants, marsh club-moss and royal fern in some abundance by the loch edge. The site also contains nationally rare flowering plants such as brown beak-sedge (Rhynchospora fusca).

The islands support a varied breeding bird community and many of the small mammals typical of western wood and loch margin. Invertebrate present are also of note, and include many typical pinewood species.

REMARKS: The whole site is a National Nature Reserve, declared in 1977.
Grade 1.

PREVIOUS NOTIFICATIONS: 1974.

LOCH MAREE ISLAN ROSS & CROMARTY



NATIONAL NATURE RESERVE

NATURE CONSERVANCY COUNCIL

Site boundary thus

Scale 1:25 000

0 Metres 500 1,000

0 Yards 500 1,000 1,500



Based on the Ordnance Survey 1:25 000 map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved 1984/3

OPERATIONS LIKELY TO DAMAGE THE FEATURES OF SPECIAL INTEREST

Anyone who proposes to carry out one of the operations listed below must first consult the Nature Conservancy Council.

Standard Ref No	Type of Operation
1	Cultivation, including ploughing, rotovating, harrowing and reseed
2	Changes in the grazing regime, including type of stock or level or seasonal pattern of grazing and cessation of grazing.
3	Introduction of stock feeding.
5	Application of manure, fertilisers and lime.
6	Application of pesticides, including herbicides (weedkillers).
7	Dumping, spreading or discharge of any materials.
8	Burning.
9	The introduction into the site of any wild or domestic animal*, plant or seed.
10	The killing or removal of any wild animal*, including pest control.
11	The destruction, removal or pruning of any plant or plant remains.
12	Changes in woodland management, including planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood changes in species composition, cessation of management.
13a	Drainage, including the use of mole, tile, tunnel or other artificial drains.
14	The changing of water levels and tables and water utilisation, including irrigation, storage and abstraction from existing water bodies.
15	Infilling of pools and marshes.
16a	Changes in freshwater fishery production or management, including sport fishing and angling.
20	Extraction of minerals, including peat, sand and gravel, topsoil, subsoil
21	Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables above or below ground.
22	Storage of materials.
23	Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
26	Use of vehicles or craft likely to damage features of interest.
27	Recreational or other activities likely to damage flora and fauna.
28	Changes in game and waterfowl management and hunting practice.
animal*	includes any mammal, reptile, amphibian, bird, fish or invertebrate.

FOREST ENTERPRISE/SCOTTISH NATURAL HERITAGE
MANAGEMENT STATEMENT
FOR
EILEAN RUARIDH MOR

LOCH MAREE ISLANDS NATIONAL NATURE RESERVE

INTRODUCTION

This brief Management Statement is intended to provide a working document to ensure FE and SNH co-operative management of Eilean Ruaridh Mor. Whilst specific to Eilean Ruaridh Mor, the full rationale for the statement is provided in the current SNH Management Plan for the National Nature Reserve, for a ten year period 1995-2005. (See Appendix 1).

GENERAL AIM

To protect and maintain the ancient semi-natural woodland and associated communities on Eilean Ruaridh Mor.

OPERATIONAL OBJECTIVES

1. To manage the woodland and associated habitats by a policy of minimum intervention so as to maintain the unique woodland gene pool and the undisturbed nature of the island.
2. To develop a strategy for monitoring natural woodland processes.
3. To minimise responsible access to the islands and the loch through the use of appropriate interpretation.
4. To maintain close liaison between the Forest Enterprise and Scottish Natural Heritage on all matters relating to the island.

PRESCRIPTIONS

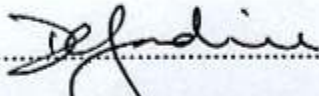
1. FE/SNH will jointly initiate monitoring to assess deer densities and then to evaluate the effectiveness of management in reducing deer grazing pressure. Sample plots will be established in areas of young regeneration, whereby annual inspections will indicate level of deer grazing.

2. Undertake positive management to reduce deer grazing pressure and maintain this at a level low enough to permit natural regeneration of the woodland. This will be done through regular deer culls carried out by Forest Enterprise Rangers in liaison with the Scottish Natural Heritage's staff at Beinn Eighe.
3. SNH/FE will jointly initiate a monitoring programme to detect changes as a result of natural woodland processes, particularly those changes associated with areas of windthrow.
4. SNH will continue to remove exotic trees and shrubs from the island. Exotic tree species will include Sitka and Norway Spruce, Grand, Silver, Noble and Douglas Fir, Western Hemlock, Lodgepole Pine and any other non native spp. *Rhododendron ponticum* is the shrub species posing the greatest threat.
5. Scottish Natural Heritage and Forest Enterprise to liaise through at least one annual meeting to be held in April each year, at which at least two representatives of each organisation are to be present.
6. Ensure that any collection of Scots pine seed from the island for purposes other than the management of the National Nature Reserve is subject to agreement between Scottish Natural Heritage and Forest Enterprise.
7. Forest Enterprise and Scottish Natural Heritage will liaise to produce coherent and effective off-site interpretation of the special interests of the Loch Maree islands and the adjacent loch.
8. Wherever possible, Forest Enterprise and Scottish Natural Heritage shall work together to minimise responsible access to the islands and ensure responsible access to the adjacent loch.

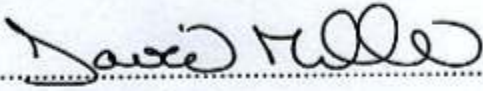
This management statement was drawn up by David Jardine and Mick Canham of Forest Enterprise and David Miller and Eileen Stuart of Scottish Natural Heritage on 28 January 1997.

This Statement will be reviewed not later than 31 January 2002.

Signed on behalf of Forest Enterprise:


David C Jardine, Forest District Manager
Inverness Forest District

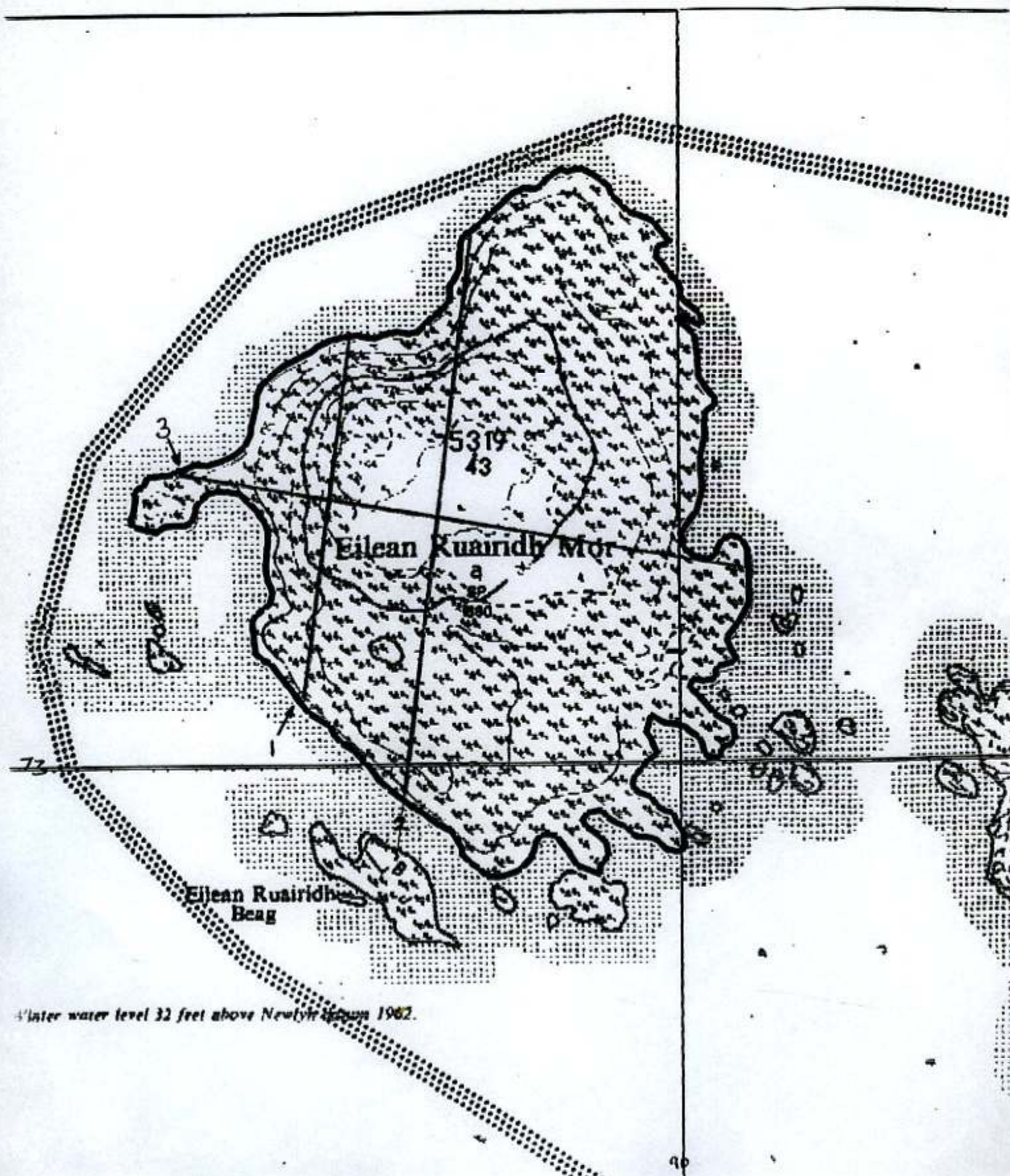
Signed on behalf of Scottish Natural Heritage:


David Miller, Manager, Beinn Eighe & Loch Maree Islands
National Nature Reserve.
For Area Manager SNH.

Appendix 3.5 Outline work programme (4 year business plan)

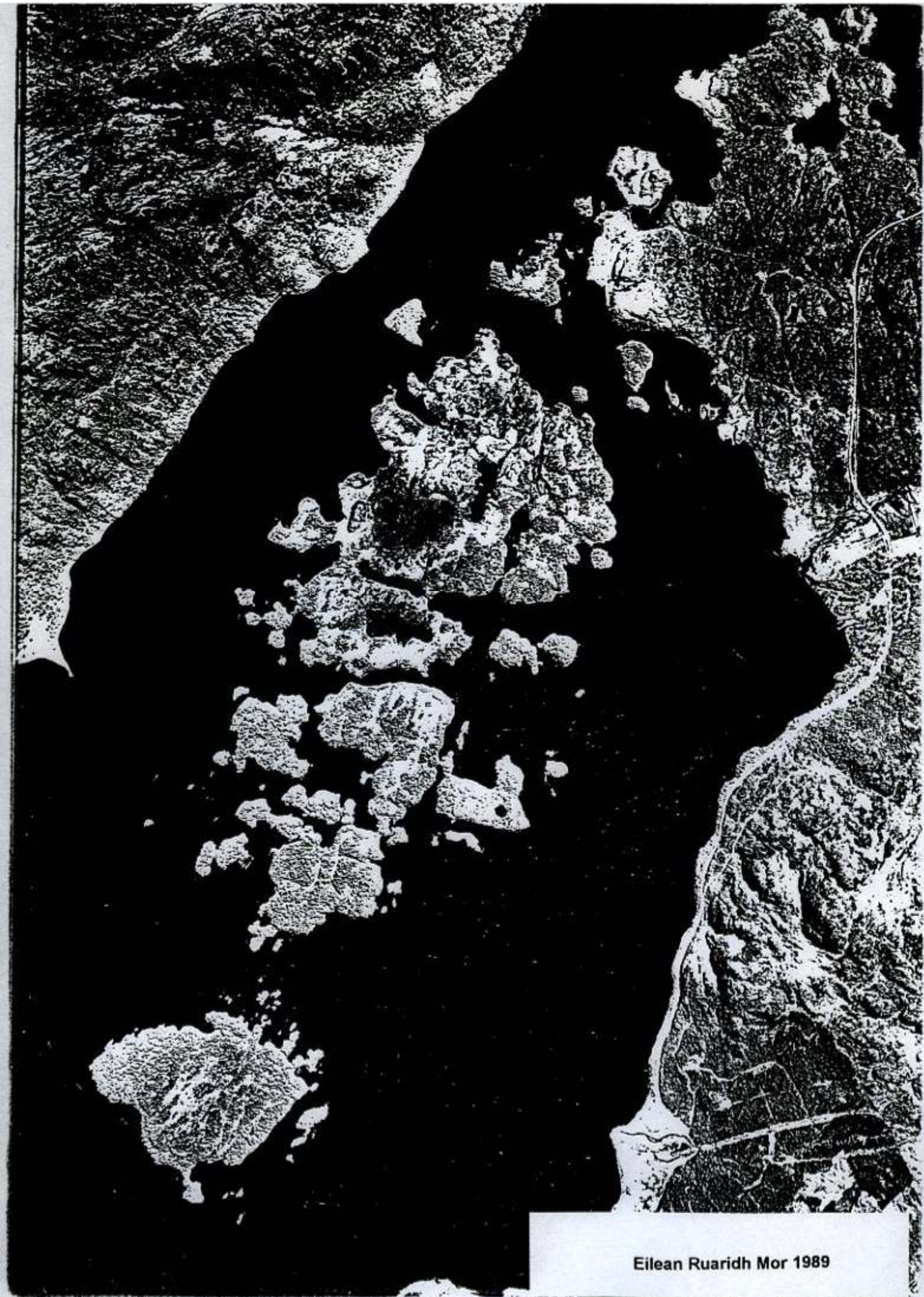
Work detail	Date scheduled	Date completed	Notes
Hold annual liaison meeting with SNH	April 1998		
Continue Rhododendron and other exotic conifer control	1998		
Monitor deer density transects	1998		
Establish monitoring of changes as a result of Natural woodland processes	1998		
Carry out fixed point photography as detailed in 1.62.ii	1998/2003/2008 and at 5 year intervals after		

Eilean Ruairidh Mor showing locations of Deer dung transects (Note transect 3 is also the recommended route for the Peterkin vegetation monitoring transect)

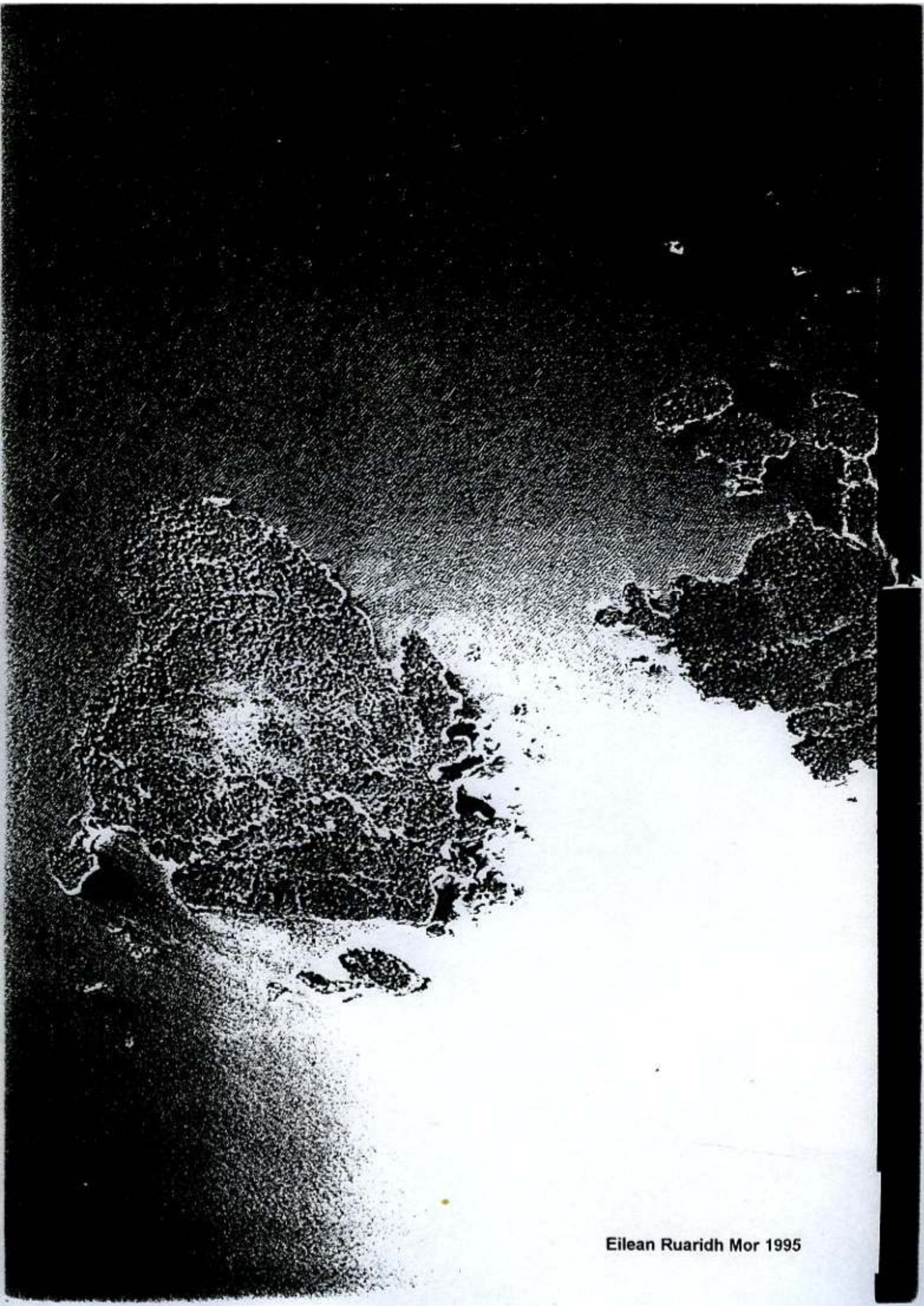


Monitoring: Transect Data

Transect No & Type	Grid Reference (start)	Grid Reference (Finish)
1. Deer dung	NG89517307	NG89567356
2. Deer dung	NG89657294	NG89727371
3. Deer dung/ Vegetation	NG89327326	NG90107337



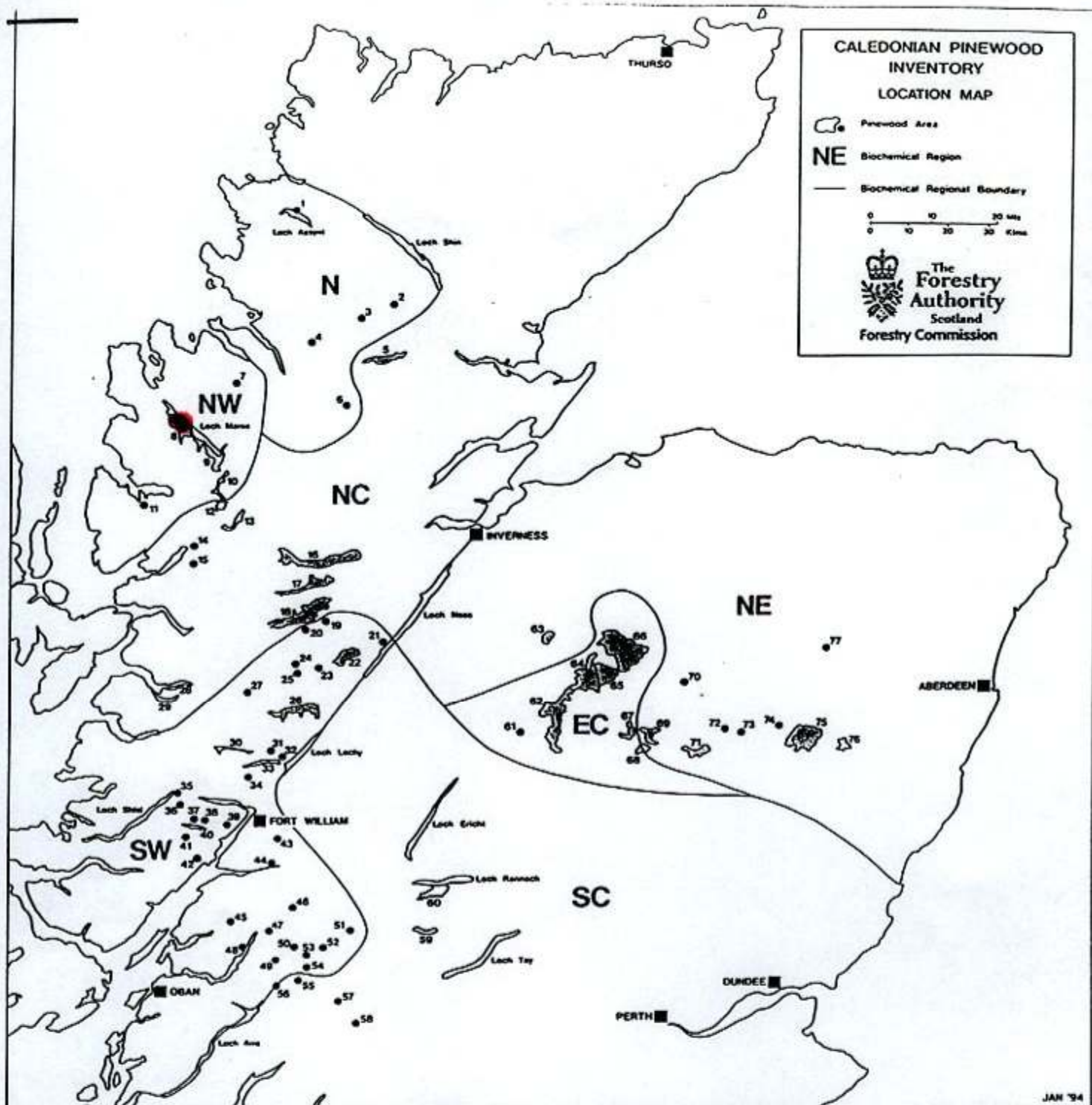
Eilean Ruaridh Mor 1989



Eilean Ruaridh Mor 1995

Appendix 3.7

National Pinewood Plan (Part)



JAN '94

CALEDONIAN PINWOOD INVENTORY INDEX

NO. PINWOOD NAME

1. LOCH ASSYNT
2. STRATH OYKEL
3. GLEN EIMIG
4. REIDORROCH
5. ARAT
6. STRATH VAICH
7. COIR A' GRAMHNA
8. LOCH MAREE ISLANDS
9. BEINN EIGHE
10. LOCH CLAIR
11. SHIELDAIG
12. EASAN DORCHA
13. ACHNASRELLACH
14. TADDAIL
15. ATTADALE
16. GLEN STRATHFARRAR
17. GLEN CANNICH
18. GLEN AFFRIC
19. GUISACRAH
20. COUGIE
21. ACHNACOWERAN
22. DUNDREOGAN
23. ACHLAIN
24. CREANNACROC
25. BURNLOTNE
26. GLEN GARRY

27. GLEN LOYNE
28. LOCH BOURN
29. GLEN BARISDALE
30. SOUTH LOCH ARKAIG
31. ACHNASAUL
32. DARK HILE
33. GLEN KALLIE
34. GLEN LOT
35. LOCH SHIEL
36. CALLOP RIVER
37. AM SLOCHD
38. DUBH UISGE
39. GLEANN SRON A CHREAGAIN
40. CONAGLEN
41. GLEN SCADDLE
42. GLEN GOUR
43. GLEN NEVIS
44. LOCH LEVEN
45. GLEN URE
46. ALLT CHAORUNN
47. ALLT NHEURAN
48. ARD TRILLEACRAH
49. GLEN KINGLASS
50. LOCH DOUCHRARD
51. CHAUNACH
52. DOIRE DARACH

53. GLEANN FUAR
54. ALLT COIRE BHIOCAIR
55. ALLT BROIGHLEACHAN
56. GLEN STRAE
57. COILLE COIRE CHUILC
58. GLEN FALLOCH
59. HEGGERNIE
60. BLACK WOOD OF RAJNOCH
61. GLEN TROMIE
62. GLEN FESNIE
63. KINVEACHY
64. ROTHIEKURCHUS
65. GLENHORE
66. ABERMETHY
67. GLEN DENRY
68. GLEN LUI
69. GLEN QUOICH
70. GLEN AVON
71. BALLOCHBUTE
72. CRATHIE
73. CREAG GHIUBHAIS
74. TORPHANTRICK
75. GLEN TANAR
76. GLEN FERRICK
77. BREA

CALEDONIAN PINWOOD INVENTORY

1. Name of pinewood: LOCH MAREE ISLANDS
2. Local Authority: Highland Region, Ross & Cromarty District
3. Grid reference: NG 907 727, sheet 19 (NG86/96 & NG87/97)
4. Area of pinewood: 181 hectares
5. Area of regeneration zone: 339 hectares
6. Area of buffer zone: 3762 hectares
7. Brief description of status (including sources of evidence of nativeness):

Part of the Loch Maree Pinewood of Steven & Carlisle (see also Beinn Eighe) - the pine in the catchment of the river Grudie and areas to the east are regarded as Beinn Eighe Pinewood. Steven & Carlisle, page 233, "The Loch Maree trees are described as often, but not consistently, coarse,.....".

Biochemical region - North West based on samples of 151 and 62 trees from Eilean Ruaridh Mor (Forrest 1980) and has the highest Type A and lowest rare types of any pinewood in this region (ie least typical).

<u>Pinewood</u>	<u>Forrest Code</u>	<u>Type A</u>	<u>Rare Types</u>	<u>Number of Trees</u>	<u>Grid Reference</u>
Shieldaig	WWR SH1	4.9	72.7	264	NG 825 519
Beinn Eighe	WWR LM	10.2	41.2	216	NG 995 654
Loch Maree Islands	WWR LM1	27.8	30.3	151	NG 897 735
Loch Maree Islands	WWR LM1F	29.0	32.2	62	NG 896 732
Loch Clair	WWR CLA	14.9	37.7	101	NG 990 575
Rest of Scotland	-	44	13	-	-
Easan Dorcha	EWR CLB	36.5	11.8	85	NH 015 525
Achnashellach	EWR ACG	48.0	10.5	123	NH 019 471

Seed Collection Areas:-

N701 Loch Maree (Islands) is 144ha
N704 Slattadale is 43ha

Bain - "no recorded pinewood losses apart from small areas of windblow".

NCC Provisional Woodland Inventory NG89 (Islands):-

- 26 - NG 899 732, long semi-natural, survey A, 38 ha out of 38 ha semi-natural, on 6" map as O-C, Loch Maree Islands NNR (1977), SCNPS, owner FC (37 ha).

NCC Provisional Woodland Inventory NG97 (Islands):-

- 29 - NG 907 732, ancient, survey A, 2 ha out of 2 ha semi-natural, on 6" map as D-C, Loch Maree Islands NNR (1977), SCNPS.
- 30 - NG 908 725, ancient, survey A, 36 ha out of 36 ha semi-natural, on 6" map as D-C O-C, Loch Maree Islands NNR (1977), SCNPS.
- 31 - NG 909 721, ancient, survey A, 7 ha out of 7 ha semi-natural, on 6" map as D-C O-C, Loch Maree Islands NNR (1977), SCNPS.
- 32 - NG 912 730, ancient, survey A, 9 ha out of 9 ha semi-natural, on 6" map as D-C O-C, Loch Maree Islands NNR (1977), SCNPS.

- 33 - NG 916 718, long semi-natural, survey A, 3 ha out of 3 ha semi-natural, on 6" map as D-C O-C, Loch Maree Islands NNR (1977), SCNPS.
- 35 - NG 918 722, ancient, survey A, 21 ha out of 21 ha semi-natural, on 6" map as O-C, Loch Maree Islands NNR (1977).
- 36 - NG 922 727, ancient, survey A, 2 ha out of 2 ha semi-natural, on 6" map as O-C, Loch Maree Islands NNR (1977), SCNPS.
- 37 - NG 924 724, ancient, survey A, 4 ha out of 4 ha semi-natural, on 6" map as O-C, Loch Maree Islands NNR (1977), SCNPS.
- 38 - NG 928 714, long semi-natural, survey A, 2 ha out of 2 ha semi-natural, on 6" map as D-C O-C, Loch Maree Islands NNR (1977), SCNPS.
- 39 - NG 931 723, ancient, survey A, 2 ha out of 2 ha semi-natural, on 6" map as D-M, Loch Maree Islands NNR (1977), SCNPS.
- 40 - NG 932 718, ancient, survey A, 3 ha out of 3 ha semi-natural, on 6" map as O-M, Loch Maree Islands NNR (1977), SCNPS.

Note there are planted larch on the island which is No. 39.

NCC Provisional Woodland Inventory NG97 (North Shore of Loch Maree):-

- 27B - NG 909 748, other wood, survey A, 4 ha out of 4 ha semi-natural, Ardlair-Letterewe SSSI (1986), NCR.
- 41 - NG 932 732, ancient, survey A, 65 ha out of 65 ha semi-natural, on 6" map as D-B O-B, Ardlair-Letterewe SSSI (1986), NCR.
- 41B - NG 917 742, long semi-natural, survey A, 6 ha out of 6 ha semi-natural, Ardlair-Letterewe SSSI (1986), NCR.
- 41C - NG 921 738, other wood, survey A, 18 ha out of 18 ha semi-natural, Ardlair-Letterewe SSSI (1986), NCR.
- 41D - NG 927 734, other Roy, survey A, 14 ha out of 14 ha semi-natural, Ardlair-Letterewe SSSI (1986), NCR.

NCC Provisional Woodland Inventory NG96 (South & Loch Maree):-

- 2 - NG 916 690, long semi-natural, survey A, 26 ha out of 26 ha semi-natural, on 6" map as O-B S-B S-M, Talladale Gorge SSSI (1984).
- 4 - NG 927 693, long semi-natural, survey B, 3 ha out of 3 ha semi-natural, on 6" map as S-B, SNCPS.
- 5 - NG 929 689, long semi-natural, survey B, 2 ha out of 2 ha semi-natural, on 6" map as D-B O-B, SCNPS.

NCC Provisional Woodland Inventory NG97 (South of Loch Maree):-

- 28B - NG 911 707, ancient, survey B, 16ha out of 35ha semi-natural, on 6" map as O-B, owner FC (31ha)

SSSI and other designations:

Loch Maree Islands NNR
 Ardlair - Letterewe SSSI
 Talladale Gorge SSSI
 Wester Ross NSA
 Loch Maree GLV

References:

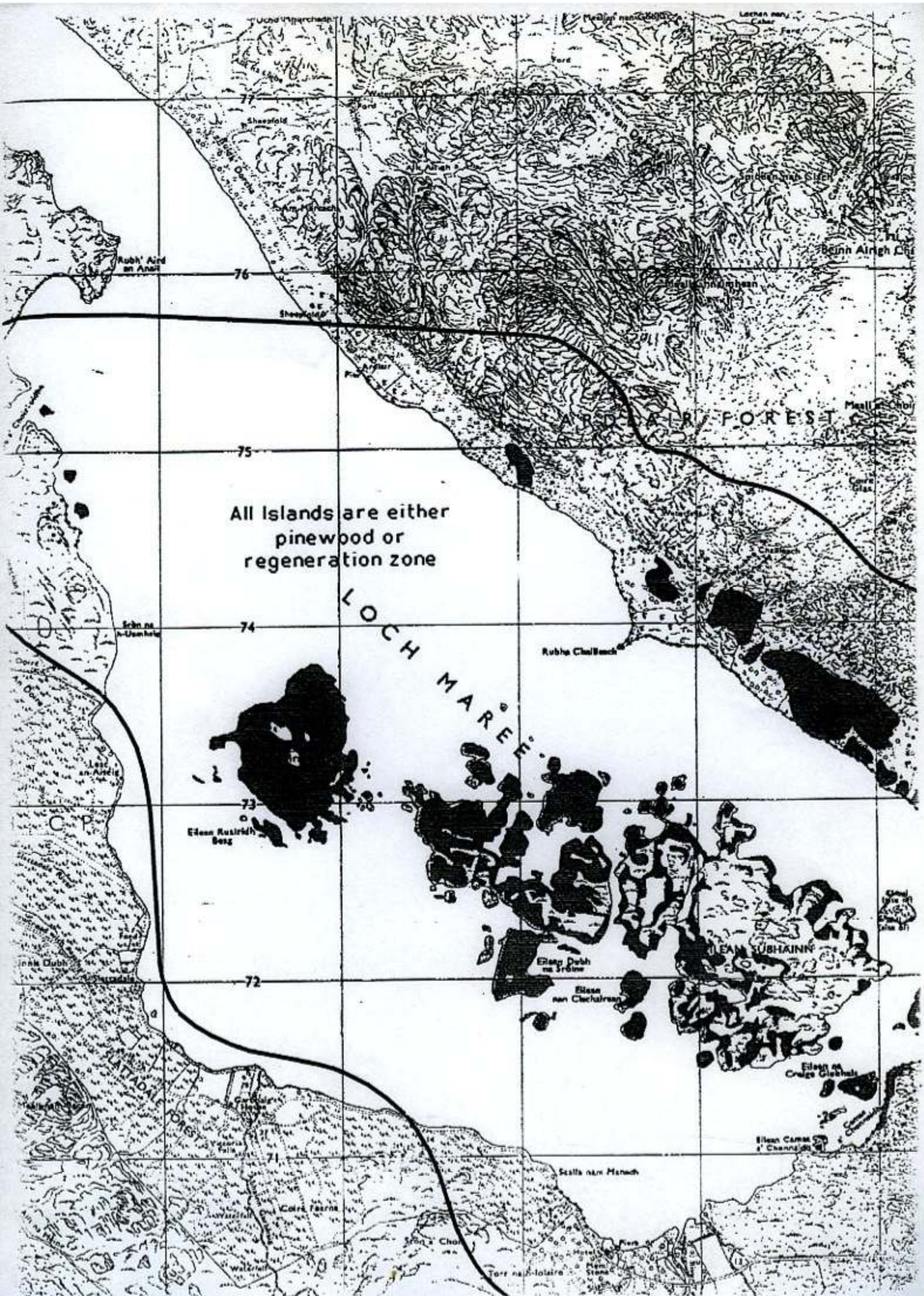
Booth (1977) - Eilean Ruairidh Mor
 Durno & McVean (1959) - history
 Helgason & Ennos (1991) - genetics
 McVean (1961a), (1961c), (1966) - direct sowing

Mitchell, McCowan & Willcox (1982) - deer enclosure
Native Pinewood manages visit Oct. 1992
NCC (1989) - Woodland Trail Guide & (1992) Handout
See also list in file

Tuley visit October 1992 - the islands still suffer from deer and are lacking in broadleaves. The north shore of the loch should be considered a native woodland of mixed species with pine as a component. The fragments on the south shore need encouragement to regenerate.

Inventory map is based on detailed survey by SNH. Buffer zone meets the buffer zone of the Beinn Eighe pinewood.

Updated 9 December 1993



Appendix IV - FC Pinewoods as entries in the FA Caledonian Pinewood Inventory.

Forest Enterprises' understanding of the resource within FC ownership is and will continue to run ahead of status as recorded in the Inventory. FE will periodically submit updates to FA. Figures provided here therefore under-state the current extent of the resource on FC land but are provided merely to compare FC holdings with a total, across the common platform of the FA Inventory.

Caledonian Inventory name	Pinewood Area Ha
Glen Einig	7
Loch Marce Islands*	43
Achnashellach	69
Glen Cannich*	25
Glen Affric*	1625
Guisachan	20
Cougie	92
Dundreggan	71
Achlain	1
Glen Garry	246
South Loch Arkaig	229
Glen Loy	73
Callop River	62
Ard Trilleachan	2
Allt Coire Bhiocair	20
Allt Broighleachan	9
Black Wood of Rannoch*	725
Glen Feshie*	25
Glenmore	414
Total FC Ownership	3758
Other Ownerships	XXXXXX
Total Pinewood on FA Inventory	16046

FC Therefore manages x% of the resource as outlined in the FA inventory.

NB * following the name of a remnant indicates that the area given here relates to only the FC part of the wood and other ownerships account for further area.

03-FEB-1994

CALEDONIAN PINWOOD INVENTORY

A - REFERENCE NUMBERS ON MAP and Caledonian Pinewood Inventory Name with Areas and other information

NO. MAP - number on map of Scotland showing location of the pinewoods
 CALEDONIAN PINWOOD INVENTORY NAME - in the Forestry Authority Inventory
 AREA PINE - pinewood area - boundary on map is 0.35mm solid line (area shaded green on microfilm maps) areas where at least 4 pine stems per ha
 AREA REGN - regeneration zone - boundary on map is 0.50mm pecked line (line highlighted blue on microfilm maps) normally 100m wide
 AREA BUFF - buffer zone - boundary on map is 1.00mm solid line (line highlighted red on microfilm maps) normally 500m wide beyond regen zone
 TOTAL AREA - sum of area of Pinewood plus Regeneration and Buffer zones
 KM EW - width of buffer zone in km from east to west
 KM NS - width of buffer zone in km from north to south
 BIO REG - BIOCHEMICAL REGION - (* = guess), N-North, NC-North Central, NE-North East, EC-East Central, SC-South Central, SW-South West and NW-North West
 GRID REFERENCE - grid reference of centre of pinewood

NO. MAP	CALEDONIAN PINWOOD INVENTORY NAME	AREA PINE	AREA REGN	AREA BUFF	TOTAL AREA	KM EW	KM NS	BIO REG	GRID REFERENCE
1	Loch Assynt	1	18	617	636	3	1	N*	NC 190 255
2	Strath Oykel	13	29	199	241	1	1	N	NC 458 016
3	Glen Einig	26	94	542	662	3	2	N	NH 365 988
4	Rhidorroch	64	148	1896	2108	4	2	N	NH 235 933
5	Amat	172	367	2090	2629	11	3	NC	NH 460 855
6	Strath Vaich	43	41	346	430	1	2	N	NH 342 766
7	Coir a' Ghamhna	3	13	133	149	1	1	NW	NH 056 825
8	Loch Maree Islands	181	339	3762	4282	7	8	NW	NG 907 727
9	Beinn Eighe	194	644	4822	5660	8	8	NW	NG 995 654
10	Loch Clair	152	340	2038	2530	3	6	NW	NG 990 575
11	Shieldaig	106	196	951	1253	4	3	NW	NG 823 524
12	Easan Dorcha	57	196	719	972	3	3	NC	NG 010 522
13	Achnashellach	69	175	1336	1580	6	4	NC	NH 035 470
14	Taodail	3	19	178	200	1	1	NC*	NG 950 422
15	Attadale	35	188	870	1093	4	3	NC*	NG 943 370
16	Glen Strathfarrar	640	1350	7220	9210	20	4	NC	NH 335 390
17	Glen Cannich	304	354	2656	3314	15	6	NC	NH 222 306
18	Glen Affric	1539	1927	3356	6822	16	8	NC	NH 240 240
19	Guisachan	20	68	902	990	2	3	SW	NH 285 225
20	Cougie	92	245	851	1188	4	3	SW	NH 235 205
21	Achnaconeran	11	74	233	318	2	2	SW*	NH 437 175
22	Dundreggan	71	349	1659	2079	7	5	SW*	NH 326 120
23	Achlain	1	16	149	166	1	1	SW*	NH 273 117
24	Creannacroc	14	44	223	281	1	1	SW*	NH 215 125
25	Bunloyne	9	58	318	385	2	2	SW*	NH 217 097
26	Glen Garry	246	952	2900	4098	13	4	SW	NH 230 010
27	Glen Loyne	0	200	381	581	2	1	SW	NH 085 050
28	Loch Hourn	34	119	984	1137	4	2	NC*	NG 905 065
29	Glen Barisdale	84	244	1728	2056	7	3	NC	NG 890 030

13-FEB-1994

CALEDONIAN PINWOOD INVENTORY

IO. Caledonian Pinewood IAP INVENTORY NAME	AREA PINE	AREA REGN	AREA BUFF	TOTAL AREA	KM EW	KM NS	BIO REG	GRID REFERENCE
30 South Loch Arkaig	229	213	1755	2197	12	3	SW*	NN 040 910
31 Achnasaul	6	53	299	358	1	2	SW*	NN 156 905
32 Dark Mile	8	54	296	358	2	1	SW*	NN 180 892
33 Glen Mallie	394	350	1959	2703	10	3	SW	NN 115 875
34 Glen Loy	73	73	489	635	2	1	SW	NN 095 840
35 Loch Shiel	27	65	501	593	2	2	SW*	NM 910 799
36 Callop River	62	138	620	820	2	3	SW*	NM 923 763
37 An Slochd	56	74	475	605	2	2	SW*	NM 963 733
38 Dubh Uisge	4	14	294	312	1	1	SW*	NM 987 737
39 Gleann Sron a Chreagain	5	11	164	180	1	1	SW*	NN 038 726
40 Conaglen	185	169	1091	1445	6	2	SW*	NM 965 715
41 Glen Scaddle	16	90	1084	1190	3	3	SW*	NM 940 676
42 Glen Gour	15	53	1216	1284	4	4	SW*	NM 961 629
43 Glen Nevis	15	32	290	337	2	1	SW	NN 165 684
44 Loch Leven	16	83	670	769	5	2	SW*	NN 166 625
45 Allt Chaorunn	4	19	215	238	1	1	SW*	NN 206 512
46 Glen Ure	2	10	573	585	5	2	SW*	NN 042 480
47 Ard Trilleachan	2	29	143	174	1	1	SW*	NN 083 410
48 Allt Mheuran	18	78	360	456	1	3	SW*	NN 141 455
49 Glen Kinglass	6	33	376	415	3	2	SW*	NN 157 387
50 Loch Douchard	5	13	156	174	1	1	SW*	NN 215 418
51 Crannach	70	126	909	1105	2	2	SW*	NN 352 460
52 Doire Darach	39	81	301	421	2	1	SW	NN 286 417
53 Gleann Fuar	30	133	647	810	2	2	SW*	NN 243 389
54 Allt Coire Bhiocair	20	57	743	820	2	1	SW	NN 245 362
55 Allt Broighleachan	9	58	323	390	1	1	SC	NN 226 328
56 Glen Strae	4	18	178	200	1	1	SW*	NN 164 312
57 Coille Coire Chuilc	67	106	351	524	2	1	SC	NN 330 280
58 Glen Falloch	0	143	342	485	2	2	SC	NN 367 233
59 Meggernie	278	144	791	1213	5	2	SC	NN 555 455
60 Black Wood of Rannoch	1009	216	950	2175	8	4	SC	NN 580 560
61 Glen Tromie	23	57	646	726	1	2	EC	NN 780 970
62 Glen Feshie	919	1968	4012	6899	8	17	EC	NN 855 990
63 Kinveachy	340	272	790	1402	4	3	NE	NH 830 180
64 Rothiemurchus	1759	1721	1842	5322	7	10	EC	NH 930 080
65 Glenmore	414	690	2129	3233	6	6	EC	NH 980 090
66 Abernethy	2063	3068	3883	9014	13	10	EC	NJ 030 140
67 Glen Derry	246	451	1163	1860	4	5	EC	NO 040 945
68 Glen Lui	164	405	915	1484	4	3	NE*	NO 075 905
69 Glen Quoich	426	1074	750	2250	5	5	NE	NO 095 952
70 Glen Avon	4	20	304	328	1	1	NE	NJ 176 072
71 Ballochbuie	647	882	1051	2580	7	4	NE	NO 210 900
72 Crathie	135	201	480	816	3	2	NE*	NO 270 955
73 Creag Ghiubhais	40	84	308	432	2	2	NE*	NO 315 955
74 Torphantrick	32	89	355	476	2	1	NE*	NO 410 973
75 Glen Tanar	1578	1381	2524	5483	9	8	NE	NO 408 920
76 Glen Ferrick	390	317	765	1472	4	4	NE*	NO 570 915
77 Breda	8	34	277	319	1	1	NE*	NJ 527 157

[illegible]

Appendix 3.8**References**

- | | |
|--|--|
| Scottish Natural Heritage | Loch Maree Islands Ten Year Management Plan 1995-2005
Prepared by Andy Forster, Edited by Tim Clifford. |
| Forrest G.I. (1980) | Geotypic variation among native Scots Pine populations in
Scotland based on Monoterpene Analysis. <u>Forestry</u> , 53, No 2
101-128 |
| Scottish Natural Heritage
& Forest Enterprise | Joint Management Statement
David Jardine, Mick Canham
David Miller, Eileen Stuart |
| Forest Enterprise | GB plan for native Caledonian Pinewood on Forestry Commission
land. |
| Forestry Authority | Caledonian Pinewood inventory |
| H.M.Steven &
A. Carlisle (1959) | The Native Pinewoods Of Scotland |

Appendix 3.9

Event Record

MONITORING IN NATIVE WOODLAND RESERVES

by George Peterken

Beechwood House, St Briavels Common, Lydney, Glos GL15 6SL

BACKGROUND

This paper has been prepared at the request of Forest Enterprise (North Scotland). It is based on a discussion paper prepared on 16 January 1994 and the subsequent discussion on 9 February 1994. Forest Enterprise (N.Scotland) have recently identified 3000ha of native pine woodland and 6000ha of native broadleaved woodland on their estate, the larger fragments of which have been declared as Caledonian Forest Reserves. FE have set aside significant funds for restorative and other management action and there is a need to monitor the ecological effects of management. Any experience gained in monitoring may help Forestry Authority to develop a system for monitoring some aspects of private woodland management.

CONTENTS

1. The need
2. A monitoring strategy
3. Design principles
4. Features to record
5. The core record
 - Habitat map
 - Permanent transects through woodland
 - Grazing assessment
 - Event Record
 - Relocatable photographs
 - Copies of recent and old air photographs
6. The optional record ("Wish list")
 - New records
 - Retrospective records
 - Opportunism
7. Archiving and the institutional memory
 - Archiving
 - Institutional memory
8. Output
9. Summary

5. THE CORE RECORD

This will consist of six elements:

1. A habitat map
2. Permanent transects through the wooded parts of reserves
3. A grazing assessment
4. An event record
5. Relocatable (fixed point) photographs
6. Copies of recent and old air photographs

1. HABITAT MAP

The object is a map of habitats. The map must be based on a classification which should:

- clearly distinguish between wooded and unwooded ground, so that a measure of "open space" can be made.
- show the extent and boundaries of unwooded habitats at the level of grassland, heathland, fen, bog, watercourse.
- show the extent and boundaries of the main woodland types, based on species dominance in the canopy (e.g., birchwood, oakwood, birch-oakwood, ...) and stand maturity (e.g., mature, pole, mixed ages;).

Notes

- *SSSI maps by SNH may well give this level of detail and may provide a good basis*
- *More detailed instructions will be needed on how to draw up a classification for individual sites which conforms to standards applied across all N. Scotland.*
- *There is a problem about how to classify open woodland, which is particularly common in N. Scotland.*
- *A worked example would be particularly useful in demonstrating methodology here.*
- *The air photographs (8, below) will be an important source, almost essential to define boundaries.*
- *Decisions will be needed on scale, i.e. the minimum size of feature to be identified.*

For some reserves a map of National Vegetation Classification types may be available. This is not quite the same thing as the habitat map. It will show the main types of open vegetation in greater detail than a habitat map, but it will not show dominance patterns in the woodland, nor structure, and there may be ambiguities in open woodland. An NVC and a soil map form part of the wish-list.

2. PERMANENT TRANSECTS THROUGH WOODLAND

Woodland structure and composition can be monitored by permanent plots and transects or by plotless sampling. The former has been selected because real patches of ground are observed, the fate of identifiable individual trees is monitored and photographic (fixed-point) monitoring is possible. Care must be taken to ensure that plots are reasonably representative of the whole reserve.

Permanent plots can be any shape, round or square. They can be distributed randomly or regularly: either way the whole wood is sampled. Alternatively, transects can be monitored, which may be less representative, but display the group structure better than plots and demonstrate larger-scale zonation. Experience shows that transects are normally much easier to relocate and survive periods of neglect better than plots.

The core record will take the form of a transect or transects. It will be 20m wide and within it all trees, shrubs and saplings with are (or have been) over 1.3m high will be recorded. The core record will show the location of each individual to the nearest 10cm, its species and its DBH(cm). Transects will be sited through representative samples of the wooded parts of reserves, running across the main features of variation, and including samples of clearings which might develop into woodland in the future. They will be divided into 30m sections and marked with posts on the centre line at the end of each section. Photographs will be taken from each 30m post down the centre of each section.

Once the transects have been established and surveyed for the first time, they can be re-recorded (wholly or in part) whenever an assessment of stand development is needed. A recording interval of 10 ± 3 years is recommended.

Notes

- A full instruction book will be needed, which would be a re-write of part of the Backmeroff/Peterken NCC booklet.
- Appendix 1 reviews what has been achieved from permanent plot and transect recording over c50 years in Lady Park Wood and Black Wood of Rannoch. This will, I hope, demonstrate the long-term value of such records and make it clear that patience may be needed.
- Open vegetation may be more important than wooded vegetation in a reserve. We will have to find different methods for this (?from SNH), but still based on permanent plots + fixed-point photographs.

3. GRAZING ASSESSMENT

Grazing will be monitored by

..... (methods to be obtained from SNH).

4. EVENT RECORD

An event record will be kept for each reserve. The aim will be to record natural (e.g. fire) and man-made (e.g. erecting a fence, thinning a stand) events when they occur and the immediate impact (e.g., "light snipe of the ground vegetation, killing all saplings, trees above a certain size left intact"). The system can also contribute to the institutional memory by recording each research project, survey, recording date and new source of information as an event. The system can also be used to record chronic events, such as numbers of visitors, significant changes in deer populations. It can also incorporate a diary of important species if, e.g., the successful breeding of a species is treated as an event, or the first sighting of a potential pest.

The events to be recorded as the core record will therefore be:

- Natural and semi-natural events which do or may make an impact on the ground, such as fires, blowdowns, outbreaks of disease, floods, episodes of ice- and snow-damage to trees, landslides, droughts, significant changes in deer populations or any other grazing/browsing animals.
- Management actions which make their mark on the ground, such as felling, fencing, removal of fencing, scarification, path building and repair.
- Research projects, surveys, establishment of monitoring plots, re-recording of monitoring plots, reports written about the reserve, papers published, by FE or by anyone else.
- Other events which the site manager regards as worth recording.

For each event the basic record should be (i) what happened, (ii) when, (iii) where (defining boundaries on a map), and (iv) what the immediate consequences were on the ground (if any). Photographs should record the main features.

5. RELOCATABLE PHOTOGRAPHS

Photographs are a particularly valuable form of record because they are cheap to make, can be used to demonstrate change to visitors and successor staff, and create an unedited record. The last point needs some explaining. A systematic, quantitative, standardised record (such as the transect record) is useful for detailed analysis of the

features recorded, which are the features that were thought to be important when monitoring started. Photographs complement this kind of record because they show everything in the field of view, including features which the photographer did not notice and would not have thought to be important. For example, a photograph may be taken to illustrate a mixed age structure stand, but 20 years later it may prove to be valuable in determining the onset of a new disease, or estimating the impact of deer on the herbage.

Photographs are most valuable if they can be repeated from exactly the same place with exactly the same focal length lens. The basic record should therefore be the print, a location reference (usually a spot on a map and the compass direction), a date and the focal length of the lens.

The photographs in the core record should be:

- General views to illustrate the habitat map, locations being marked on a copy of that map.
- Stand structure photographed along the centre line of transects, shots in both directions being taken from each 30m post.
- Impact of natural and management events on the ground.

Notes

- *Fixed-point photography can be made more systematic by marking the points with posts and taking a photo from a fixed height above the post. NCC once produced a handbook, which may be useful.*
- *I have no fixed views on colour v monochrome, but I feel that black and white prints are the most tried and tested. Colour prints may be better than transparencies.*

6. COPIES OF RECENT AND OLD AIR PHOTOGRAPHS

Recent a/ps facilitate habitat mapping (1, above) but they also show a wealth of features, such as canopy characteristics, larger dead trees, tracks, former habitation sites, etc. Because most reserves will have been photographed at several dates, starting with the c.1946 post-war set, a/ps are the quickest route to detecting major changes over the last 40 years. It would therefore be worth collecting these for all sites: this can be done centrally.

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Date: *14/4*

Number of pages: *5*
[including this one]

David

- ① Extract from G. Petukken's report on Native Woodland Monitoring giving details of methodology for transects.
- ② We would be interested in assisting in the design of transect locations and layout with respect to the existing and future woodland structure as detailed in Alan Stevenson's letter.

Best Wishes

Chris Nixon