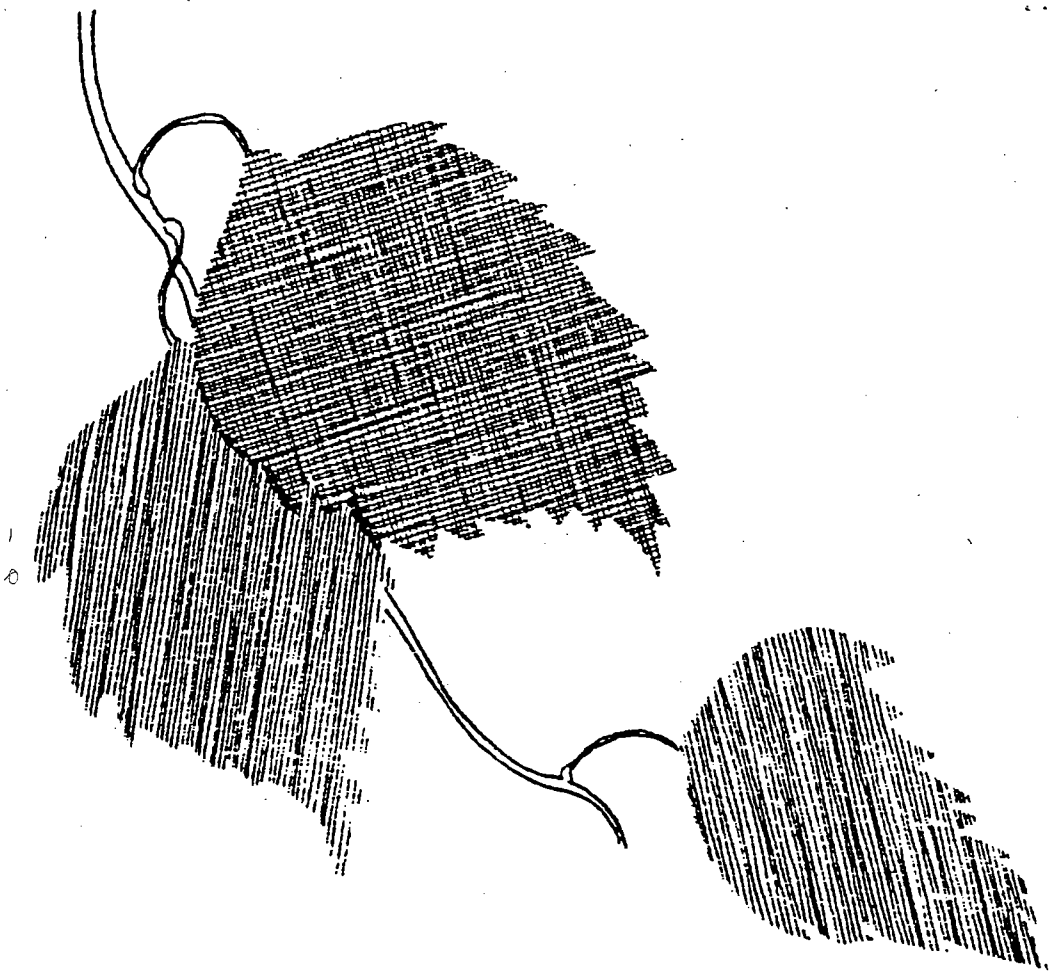

native woodlands discussion group

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NEWSLETTER

NUMBER 6

SPRING 1978

NATIVE PINEWOODS DISCUSSION GROUP

NEWSLETTER NUMBER 6

SPRING 1978

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NATIVE PINEWOODS DISCUSSION GROUP

NEWSLETTER NUMBER 6 - SPRING 1978

Two main items are covered in the Newsletter, firstly, an account of the 1977 field meeting based on Ballachulish and, secondly, the future of the Discussion Group, an issue which was given a first airing at the last field meeting. To the main content of the Newsletter we have appended the results of a collection of beetles made in the pinewoods during the 1977 field meeting and a revised mailing list. Additionally we are seeking members' comments on a possible venue for the 1978 field meeting.

THE 1978 FIELD MEETING

In accordance with the general trend of the discussion regarding the future of the Group (see below for details) it was proposed that the 1978 Field Meeting should be based in an area where, as well as a native pinewood, native woodlands of other types could be visited.

Two proposals have so far been received. The first is for a meeting in Deeside visiting a pinewood, together with mixed pine/birch and oakwoods. The second is for a meeting based in the Dornoch Firth area to visit the Amat Native Pine and associated birchwoods and alder wood. It would be helpful if members could complete the enclosed form stating their preference and return it to the address below.

R Goodier
Nature Conservancy Council
12 Hope Terrace
EDINBURGH
EH9 2AS

R G H Bunce
Institute of Terrestrial Ecology
Merlewood Research Station
Grange over Sands
Cumbria LA11 6JU

REPORT OF THE 1977 MEETING AT BALLACHULISH

The meeting was held on the 27-29 October and based at the Ballachulish Hotel.

27 October

INTRODUCTION. In the evening Mr Goodier (NCC Edinburgh) welcomed the participants to the meeting and reviewed events relating to native pinewoods and their conservation which had taken place since the previous field meeting in October 1976.

New Pinewood Reserves

Two new native pinewood National Nature Reserves had been established in 1977, Glen Strathfarrar in Steven and Carlisle's 'Strathglas' group, and the Pinewoods on the Reserve at Beinn Eighe in the Wester Ross Group have been augmented by the addition of the Loch Maree Islands as a new Reserve.

The Nature Conservancy Council concluded a Nature Reserve Agreement over 5,409 acres of pinewood and birchwood in Glen Strathfarrar with the owners of Struy and Culligran Estates, and declared the area as a National Nature Reserve, to protect and regenerate the pinewood whilst retaining existing land uses of hill farming, red deer management, mountain recreation and scientific study.

A warden will be appointed and a series of natural regeneration enclosures will be erected. Public access arrangements will continue as at present under a permit system operated in conjunction with the landowners and principal land users.

The pinewoods in Glen Strathfarrar are the largest surviving fragment in the central group of the native pinewoods of Scotland and carry the largest areas of mature fully stocked forest in Scotland after Abernethy and Ballochbuie. The forest has remained virtually undisturbed from felling and from conversion to commercial tree crops, and has retained its natural fauna and flora, although a high winter grazing pressure has prevented rejuvenation by natural regeneration over many years.

The new National Nature Reserve consisting of the islands in Loch Maree comprises three major islands and about 40 small islets, in all some 200 hectares. The chief scientific interest of the area is the native Scots pinewood which is the dominant vegetation.

The woods in this NNR provide a valuable complement to the neighbouring Scots pine habitat within the Beinn Eighe NNR. They possess an abundant shrub layer of well-grown juniper, perhaps the largest in western Scotland, and there are areas of forest bog where tree growth is checked by water-logging and high soil acidity.

The Loch Maree islands also demonstrate a pinewood shoreline habitat which is not found in such an undisturbed condition on any other Reserve. Compared with the mainland, these islands have been subjected to less intensive grazing pressures, burning and general disturbance, resulting in the survival of a mosaic of more 'natural' vegetation communities than those of the mainland. A further point of interest is that the vegetation on the islands represent a western outlier of a vegetational type that occurs more widely in eastern Scotland, and throughout the northern European and Asian continents.

The islands have been secured as a Reserve by Nature Reserve Agreements with the owners Gairloch Estate and the Forestry Commission. The Nature Conservancy Council proposes to manage the Reserve to conserve the existing pinewood and its associated plant and animal communities. Because of the high fire risk public access will be restricted to permit holders.

Nature Conservation Review

During the year the long awaited Nature Conservation Review had been published by the Natural Environment Research Council and the Nature Conservancy Council and the Cambridge University Press. In this work many of the native pinewoods are identified as being key sites of national importance for nature conservation. These, and other key sites identified by the Nature Conservation Review in Scotland, are also given special attention in the National Planning Guidelines published by the Scottish Development Department.

Grant Aid for Pinewood Conservation

Recently a new scheme had been announced by the Forestry Commission under which increased grant aid will be made available to private owners for the planting and natural regeneration of native pine at the Steven and Carlisle localities according to a conservation plan which would have to be agreed between the owner, the Forestry Commission and the Nature Conservancy Council.

Native Pinewood Symposium Volume

Copies of the volume on the Native Pinewoods of Scotland, comprising the papers presented at the 1975 Aviemore Symposium and published by the Institute of Terrestrial Ecology were now available for purchase by members and others at a price of £2.50.

Monitoring of Native Pinewoods

The monitoring of selected pinewoods, namely Coille Coire Chuilc, Shieldaig and the Black Wood of Rannoch, by ITE staff had continued and a pilot project on the use of aerial photographs to obtain more accurate measurements of the area and density of the pinewoods had been

groups of pine at the northern end near the junction of the Allt Broighleachan and the Allt Coire Thoraidh. The stocking is irregular and often open. Most of the pines are probably over 150 years old and there are few younger trees. Natural regeneration of Scots pine is scarce and occurs primarily on disturbed soil along stream banks (or on ploughing in adjacent plantation areas). Birch regeneration is present in some parts but has been held at ground vegetation level by animal browsing.

Since 1967 the woodland has belonged to the Forestry Commission and a large area of land to the north and east has been afforested, primarily with Sitka spruce. The extreme north end of the woodland lies inside a deer fence which was erected in 1972. The remainder is in an area protected by the forest's outer ring deer fence which was completed in 1974. The number of red deer affecting the woodland is now very small, but sheep grazing continues south of the 1972 deer fence.

A detailed description of the Allt Broighleachan pinewood (and of the smaller Allt Coire Bhiocair pinewood some two miles to the north east) is given by Steven and Carlisle in "The Native Pinewoods of Scotland" pp 222-224.

The area is to be managed as follows:-

1. The area demarcated as a Reserve will be excluded from any further commercial forest development. (This reserve area includes most all of the existing pine and birch woodland together with sizeable unstocked areas round the periphery of the woodland; the only exclusions consist of narrow birch outliers along stream valleys).

2. No natural Scots pine or broadleaved species will be cut within the reserve area.

3. The areas of Sitka spruce already planted within the northern end of the reserve will be allowed to remain for the present. However, spruce trees will be cut out whenever necessary to favour any Scots pine natural regeneration which occurs on the ploughing or to prevent damage to existing Scots pine.

4. No Scots pine will be planted in any further commercial plantations within 3 km of the reserve (and there is, in fact, no planted Scots pine in the existing plantations).

5. Protection against deer will continue by means of the ring deer fence and by shooting as necessary to restrict the deer population to the lowest practical level both in the reserve area and in adjacent plantations.

6. Protection against sheep will be provided by the erection in 1977 of a stock fence enclosing the reserve area along with adjoining plantable land.

7. No special measures will be taken to promote pine restocking (eg scarification or planting of native stock).

8. Management of the reserve will be reviewed at 5 year intervals.

During the visit to the woodland of Allt Broighleachan good native pine regeneration was observed locally, together with regeneration of other species such as holly. The response to fencing in the number of seedlings present has been dramatic, with large numbers of seedlings up to 10-15 cm being present on a wide variety of substrata from heather to Molinia. It seems likely that the growth of these had previously been controlled by the heavy grazing, and had been able to respond quite rapidly when the grazing declined. It will be interesting to see how these seedlings progress since the mature trees are only on the drier areas, yet the seedlings are found throughout. The possibility of an extension of the present site, if regeneration proves successful, has not been ruled out.

Visually the area will change completely since once the spruce have grown up the pinewood will no longer be a prominent feature - even at present it is remote and little visited. The ecology of the area will also change from moorland to plantation forest and the effects of this change in the long term are difficult to predict. Perhaps the principal change will be in the patterns of grazing in the area and its faunal relationships, since previously the pinewood was an isolated wood in the moorland context and now will be in a different type of isolation.

Loch Tulla (Coire Dorach)

Certain parts of this wood have had small blocks of species other than Scots pine planted. The fences have since been removed and the state of the trees provide some indication of the effect of introducing animals into young plantations of small sizes. Some trees were damaged but generally not too much harm had been done. The site as a whole is very wet with large tussocks of Molinia interspersed with tall heather. Seedlings were found in the heather on drier situations but were not in large numbers. However, as in Allt Broighleachan, they might appear above the heather if the grazing pressure is reduced. One area had been recently burned and had large numbers of rowan and birch seedlings, but no pine, were visible. However, this was on the bottom of the slope and could have been not quite so suitable for pine anyway. Examination of the changes following such a fire seemed useful, and the topic of monitoring was raised. One suggestion was that an informal group should be formed to carry out simple recordings on a standard basis in the pinewoods over a series of years. Although this was agreed to be a good idea, the problems of organisation are considerable.

An interesting point raised was the discovery of an old photograph of part of the wood about 100 years ago. The pine trees in the photograph were still clearly identifiable as individuals and had not changed very much. Several birch and rowan trees had however disappeared. This picture demonstrated the usefulness of photographs in identifying and for structural changes over the years - a point emphasized was the importance in taking the photographs from an easily recognisable point.

29 October

CONA GLEN

In the morning a visit was made, in company with the owner Mr John Guthrie, to the native pinewood in Cona Glen, the largest of the Steven and Carlisle 'Ardgour Group' of native pinewoods. This wood covers about 200 hectares on the southern side of Cona Glen. The ground flora is characteristic of the western oceanic pinewoods, containing much Molinia caerulea. The wood is heavily grazed by deer, being much used for winter shelter and consequently contains hardly any natural regeneration.

In an unpublished report to the Nature Conservancy Council Dr Frances Rose of Birkbeck College, London, has suggested that the relative poverty of lichen species in this wood might be due to the influence of atmospheric pollution originating in the Fort William area.

GLEN LOY

During the afternoon the group visited the native pinewood within the Forestry Commission's estate in Glen Loy. Previous reports on this area were summarised by the Forestry Commission in notes provided for the group as follows:-

Extract from the Native Pinewoods of Scotland, Steven and Carlisle 1959. "The pinewood is on undulating north facing slopes between 300 ft and 1,000 ft above sea-level. The underlying rocks are schists and gneisses of Moine series, mantled with morainic and fluvio-glacial deposits. Some

of the sandy knolls are freely drained and podsolised with a shallow raw humus layer, but some are peat covered. The hollows are wet and peaty.

The native woodland consists of a mixture of pine and birch of both species and intermediates, with a few oak, alder along the streams, and an occasional rowan and holly. On peaty sites there are many willow bushes, mainly Salix atrocinerea and S. aurita. The pinewood has now been planted with a range of coniferous species, including Scots pine of Glenloy origin. The field layer communities are similar to those at Arkaig but the growth of Molinia is even more luxuriant, and Myrica gale forms taller bushes.

Most of the pine are over 100 years old and a few over 200 years old. There are scattered trees between 60 and 100 years but the age class 20 to 60 is poorly represented. There are small groups of younger regeneration, principally on knolls with Callunetum No 10 and Calluna/Molinia No 9, and with a discontinuous raw humus layer, and most of the trees are growing vigorously. The Forestry Commission has carried out experiments on natural regeneration and sowing, but without much success. The pine are between 40 and 45 ft high".

Extract from Report on Forest Research 1951 (J A B Macdonald). "The staff of the then North of Scotland Division had been interested in natural regeneration in this native forest (Glenloy) also. A typical area specially enclosed for study in 1934 contained groups of old native Scots pine and showed some regeneration of the pine, but only on the drier knolls. In the better semi-flush depressions, with fresh soil or peat, rowan and birch are coming in strongly. When visiting recently with Dr M L Anderson and the District Officer we felt sure that successful Scots pine regeneration was much more likely to follow this birch/rowan stage than to come directly on any other ground type. It would be desperately slow in competition with heather on the knolls: the deeper peat bogs were a most unlikely seed bed and, unaided, too poor altogether. Some Scots pine artificial sowings had been made in 1935 upon material excavated from the drains, but, as so often happens, the seedlings had soon disappeared".

Extract from Natural Regeneration of Scots pine in Glenloy, Forestry Commission Journal 1937 (W N Gibson). "The treatment of the ground was as follows:-

Flushes. Half of the wet ground was drained intensively and inverted turfs were put out in blocks of 6-8. These turfs and the bottoming material spread along the drain sides were then sown with birch seed which had previously been stratified for a month in sand. The seed was covered with a thin layer of mineral soil taken from the side of one of the knolls. A portion of the turf was previously treated with ammonium phosphate. The birch was sown with the idea of getting a crop on the more unfavourable ground and it was hoped that a certain amount of Scots pine would also come in. The result was excellent, germination of the birch being extraordinarily good over all and a large number of newly germinated Scots pine also appeared. The effect of the artificial manure on germination was negligible, results being equally good on untreated ground. The remainder of the flush was drained at wide spacing, the turfs being spread as before. This was done in order to compare with the intensive drainage which might have had an adverse effect on germination by drying out the ground to too great an extent. So far it is impossible to assess the relative efficiency of the two methods.

Knolls. These were drained with deep contour drains, the mineral material being thrown out clear of the drains and spread over a three feet wide strip.

(a) Heather burnt off. One of the knolls treated as above was burnt clear of heather and other vegetation with a Hanck gun.

(b) One knoll was burnt and top dressed with ammonium phosphate.

(c) A further knoll was treated by tearing up narrow strips about 4 ft apart.

The results obtained from the above methods did not show any appreciable difference, germination being good over all the ground where the surface soil, (including peat) was exposed. In the case of the knoll with the screefed strips, this method had the advantage of being much cheaper than the others, but it was not very successful. This was due to the working of the strips being too shallow, only the top layer of peat being exposed and this was of a fibrous nature containing humus. The result was that the surface of the prepared strips, having no water retaining qualities, rapidly dried out and left a poor medium for germination.

Although seedlings germinated freely over most of the prepared ground, wet or moist conditions appeared to be most favourable, and seedlings were found in numbers even on the sides and bottoms of drains".

In spite of the rather pessimistic note struck by these earlier reports the Group found this pinewood to be one of very considerable interest. Although the regeneration is patchy it is nevertheless very adequate so that perpetuation of the relict is well assured. The rich ground flora and the admisture of oak, alder, rowan and holly add to the ecological interest and most members of the Group, few of whom had visited the site before, were most agreeably impressed at the quality of the wood and the steps which the Forestry Commission had taken to ensure its conservation. Several members expressed the hope that the Forestry Commission would prepare a management plan for the area along the lines of those for the Glen Orchy woods and that the Forestry Commission would remove some of the intrusive tongues of exotic conifers when suitable opportunity occurred and continue to control the deer so as to allow further natural regeneration. It was also suggested that the Nature Conservancy Council and the Institute of Terrestrial Ecology should assist the Forestry Commission in promoting further biological survey of the pinewood.

THE FUTURE OF THE NATIVE PINEWOOD DISCUSSION GROUP

On the evening of the 28 October the participants in the field meeting entered into an extended debate concerning the future of the Discussion Group. The work of the Group, since the first informal meetings convened by Mr Goodier in the Department of Forestry in the University of Aberdeen in 1970, was reviewed. The conclusion was reached among those present that while there was much to be said for the focus provided by the limited geographical nature of the subject matter there were strong arguments for expanding the remit of the group to cover all the native woodlands in Scotland, still including, of course, the native pinewoods. The arguments included:-

1. The wish of those members who had been associated with the Group from the beginning to expand the opportunity during the field meetings of looking at other allied ecosystems.

2. The feeling that the other native woodlands were in need of the same sort of attention that the Group had focussed on the pinewoods and that it would be impracticable to set up a separate group for this purpose because of the many participants it would have in common.

In the light of these conclusions it was resolved that the views of all persons on the mailing list of the Discussion Group would be sought and that, if the general concensus of opinion was in favour of the change, the Group would take the necessary steps to 're-constitute' itself at the next field meeting. It would, therefore, be appreciated if any members

having views on this matter would communicate them in writing to Dr Bunce or Mr Goodier by the end of June 1978.

NATIVE PINEWOODS DISCUSSION GROUP MEETING, OCTOBER 1977

LIST OF PARTICIPANTS

Dr Jean Balfour
Mr T C Booth
Dr R G Bunce
Mr A Christie
Mr W J Cristie
Mr N Dannat
Mr R Dennis
Major H W Duncan
Mr I Edwards
Mr R Goodier
Mr F A Hunter
Mr A J Kerr
Mr R Keymer
Dr A J Low
Mr C MacLean
Mr J S Smith
Mr S Taylor
Dr R C Welch
Mr E White
Mr P Wormell

NATIVE PINEWOOD DISCUSSION GROUP FIELD MEETING, 27-29 OCTOBER 1977

NOTES ON BEETLES FOUND AT THE PINEWOODS VISITED

During 28th and 29th October, 1977 R C Welch and F A Hunter visited the following native pinewoods in company with other members of the discussion group:- 28th, Loch Tulla (Doire Darach) NN 285418, GLEN ORCHY (Allt, Broighleachan) NN 2263 28 (GO), Tyndrum (Coille Coire Chuilc) NN 330280 (T); 29th, Ardgour (Cona Glen) NM 960713 (CG) and Glen Loy (Coille Phuiteachain) NN 095840 (GL). R C Welch concentrated on small sub-cortical Staphylinidae and F A Hunter on the larger xylophagous and fungicolour species although there was some duplication. The list that follows is complex enough without including the names of the captors, so these have been omitted but the records from an earlier collecting trip to Loch Tulla pinewood on 12 July 1974 were all made by R C Welch. Species recorded by F A Hunter on an earlier trip to Loch Tulla included none not found again on this trip, so these records have been omitted. The list follows the arrangement of families and species used in the 2nd Edition of KLOET, G.S. and HINCKS, W.C. (1977). A check list of British Insects, Pt 3. London.

The weather was cool with considerable rain which fell almost continuously and often heavily throughout the two days and which made collecting unpleasant and also difficult because, even under closely adhering bark, it was difficult to find any beetle habitat that was not saturated.

As the visits were so brief, it is not possible to reach even tentative conclusions about the relative value of these woods from the beetle point of view except to point out that DD and GO are probably the least valuable of the group because of their smaller size. There are no reasons to suppose that the pine beetle faunae of individual weeds will differ

significantly but the greater tree diversity in GL would probably produce greater beetle diversity at that site, especially as numbers of large oaks were present there in addition to pine, hazel, birch and rowan. CG, representing pinewoods in very oceanic areas, would repay further investigation.

When previous records from DD are included, definite records of 61 species are established, including 5 whose occurrence is based on only larval borings - such species have, however, not been included here unless the identification is certain.

In the tables, (a) signifies that adult(s) were found; (p) pupae; (l) larvae. Where adults were of a single sex, the sex is indicated. The symbol R before an entry indicates that the species concerned is largely restricted to relict Caledonian pinewoods.

The species listed are about equally divided between those especially associated with pine in Scotland (17 species) and those associated in Scotland with broadleaved trees, especially birch (13 species), the other beetles recorded being indiscriminate in this respect. Twelve of the species listed are generally regarded by coleopterists as rare or very rare.

Two "wood ants" collected from a rotten birch log at T were workers of Formica lugubris Zett. They were in company with Leptothorax acervorum (F). The woodlice Oniscus asellus L. and Porcellio scaber Lat. were recorded under bark of birch, alder, rowan and pine at all sites visited. Larvae of the fly Xylophagus cinctus (Deg.) were found under pine bark at T.

F A Hunter and R C Welch
December 1977

LIST OF BEETLES

Beetle	Habitat	Woodland area DD	GO	T	CG	GL
CARABIDAE						
Nebria gyllenhali (Sch.)	under pine bark				(a)	
Pterostichus nigrita (Payk.)	under stone	(a) 7.74				
Dromius agilis (F.)	under bark of fallen pine			(a) ♂		
DYTISCIDAE						
Hydroporus ferrugineus Steph.	in Sphagnum pool	(a) 7.74				
Hydroporus melanarius Sturm	in Sphagnum pool	(a) 7.74				
PTILIIDAE						
Ptinella errabunda Johns.	in Fomes on birch	(a) apterae				
LEIODIDAE						
Agathidium nigrinum Sturm	in rotten pine log	(a)♀ 7.74				
SILPHIDAE						
Silpha atrata L.	under bark of fallen pine					(a)
STAPHYLINIDAE						
Acidota crenata (F.)	under bark of fallen pine					(a)
Phyllodrepoidea crenata (Gr.)	dead birch with Fomes	(1)	(a)♂			
Acrulia inflata (Gyll.)	in Fomes on dead birch	(1)				
Dropephila ioptera (Steph.)	in Fomes on dead birch	(a)♂♀(1)				
Phloeonomus punctipennis Th.	in Fomes on dead birch	(a)				
Xylostiba monilicornis (Gyll.)	under fallen pine branch bark			(a)♀		
Othius angustus Steph.	in pine/bracken litter	(a) 7.74				
Othius punctulatus (Geoz.)	in dead pine and birch			(a)	(a)	
Atrecus affinis (Pk.)	under pine and (GO) alder bark		(1)	(a) (1)	(a)	(a) (1)
Quedius plagiatus Mann.	under fallen pine bark	(1)		(1)		
Quedius xanthopus Er.	under bark of fallen pine					(a) ♂
Leptusa fumida Kr.	dead birch with Fomes	(a) ♂♀ (1)?		(a)♂(1)?		
Leptusa ruficollis (Er.)	in fallen pine	(a) 7.74				
Dinaraea aequata (Er.)	in Fomes on fallen birch	(a) ♂				
Dadobia immersa (Er.)	under fallen pine br. bark			(a) ♀		
Atheta (Anopleta) corvina (Th.)	in Fomes on birch	(a) ♂				
Drusilla canaliculata (F.)	in pine/bracken litter	(a) 7.74				

	Beetle	Habitat	Woodland area DD	GO	T	CG	GL
	ELATERIDAE						
	Melanotus erythropus (Gml. in L.)	in rotten birch alder and pine	(a) (1)	(1)	(1)	(1)	(1)
R	Harminius undulatus (Deg.)	in fallen birch					(1)
	Denticollis linearis (L.)	in fallen birch and alder			(1)		(1)
	CANTHARIDAE						
	Malthodes fuscus (Waltl.)	beating pine	(a) 7.74				
	LYMEXYLIDAE						
	Hylecoetus dermestoides (L.)	borings in dead birch			(1)	borings	borings
	RHIZOPHAGIDAE						
	Rhizophagus dispar (Payk.)	under pine bark (DD) under birch bark (GO) in Fomes on dead birch (DD)	(a)	(a)			
	CUCUJIDAE						
R	Dendrophagus crenatus (Pk.)	under dead pine and rowan bark (T)	(1) 7.74		(a) (1)		(1)
	CRYPTOPHAGIDAE						
	Cryptophagus dentatus (Hbst.)	in Fomes on dead birch	(a) ♂				
	CERYLONIDAE						
	Cerylon ferrugineum Steph.	under rowan bark	(a) 7.74				
	COCCINELLIDAE						
	Aphidecta obliterata (L.)	by beating pine	(a) 7.74				
	CISIDAE						
	Cis bidentatus (Ol.)	in P. betulinus (GO) and Fomes (DD) on birch	(a)	(a)			
	Cis nitidus (F.)	in Fomes on fallen birch	(a) (1)?				

LIST OF BEETLES (contd).....

	Beetle — Habitat	Woodland area DD	GO	T	CG	GL
	MYCETOPHAGIDAE					
	Mycetophagus sp. (undet.) in Fomes on dead birch	(1)				
	TETRATOMIDAE					
	Tetratoma fungorum F. on Piptoporus on dead birch		(a)			
	PYTHIDAE					
R	Pytho depressus (L.) under pine bark				(a)	
	MELANDRYIDAE					
	Orchesia sp. undet? in rotten birch	(1)				
R	Xylita laevigata (Hell.) in rotting pine	(a)			borings	borings
	SCRAPTIIDAE					
	Anaspis rufilabris (Gyll.) by beating pine	(a) 7.74				
	CERAMBYCIDAE					
R	Asemum striatum (L.) borings in dead pine sapwood			borings		
	Rhagium bifasciatum F. in rotting logs, alder, pine	(a) (1)	(1)	(a) (1)	(a) (1)	(a) (1)
R	Rhagium inquisitor (L.) under dead pine bark	(1) 7.74		(1)	pupal cells	
	Rhagium mordax (Deg.) under dead birch/rowan bark	(1) (a)	(1/p)	(1)	(1)	(1)
R	Acanthocinus aedilis (L.) under dead pine bark	borings	(1)		borings	
	Saperda scalaris (L.)					borings
	CHRYSOMELIDAE					
	Lochmaea suturalis (Th.) on heather under pines	(a)(1) 7.74				
	Lupenus longicornis (F.) in pine/bracken litter	(a) 7.74				
	CURCULIONIDAE					
	Phyllobius pyri (L.) under dead alder/birch bark		(a)		(a)	
	Hylobius abietis (L.) beating pines	(a) 7.74				
	Pissodes sp. undet. galleries under dead pine bark			borings		
R	Eremotes ater (L.) in rotting pine trunk	(a)		borings		
	Coeliodes erythroleucos (Gmel.in L.) beating pine	(a) 7.74				

	Beetle	Habitat	Woodland area DD	GO	T	CG	GL
	SCOLYTIDAE						
	Hylurgops palliatus (Gyll.)	under dead pine bark	(a) 7.74				
	Tomicus piniperda (L.)	under dead pine bark	borings		(a)	borings	(a)
	Xyloterus domesticum (L.)	in birch			borings		
R	Pityophthorus lichtensteini (Ratz.)	under dead pine ~~and~~ branch ~~pine~~ bark	borings		borings		
	Pityogenes quadridens (Hart.)	under dead pine branch bark			(a)		
	IPS acuminatus (Gyll.)	under pine bark	(a) 7.74				