

Boleskine Environmental Network

A Survey of Aspen *Populus tremula* in South Loch Ness



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Introduction

Aspen *Populus tremula* plays host to a remarkably diverse flora and fauna. In the Scottish Highlands, where Aspen has its UK stronghold, it supports four Priority Biodiversity Action Plan (BAP) species, as well as a large number of other aspen-dependent species.

However Aspen is generally a scarce component of native woodlands, and the resource is highly fragmented.

Its range and status in Highland are not well documented, although survey work is ongoing in a few areas, such as Glen Affric and Strathspey.

The objective of this survey was to survey and map Aspen stands in South Loch Ness with the assistance of local volunteers. The survey was mainly undertaken during 2009, and covered an area of about 300 square kilometres.



The Aspen hoverfly *Hammerschmidtia ferruginea* has been recorded at one location in South Loch Ness

Raising awareness and training

In order to encourage local community participation, Boleskine Environmental Network organised a meeting in Foyers and invited John Parrott of Scottish Native Woods to give a presentation on "*The Native Woodlands of South Loch Ness*". He explained the importance of our native woodlands, and especially the significance of Aspen. The meeting was attended by about 25 people.

This was followed by an outdoor meeting in Inverfarigaig, attended by 12 people. Training was provided on the identification of Aspen, using a GPS and completing recording sheets. Nine volunteers elected to survey their local patch, and were provided with maps, recording sheets and hand-held GPS units.

Survey methods

Surveyors established the location of most Aspen stands using a GPS. Location of some inaccessible stands (on crags, for instance) was estimated with the help of map/GPS. Larger stands estimated to be over 0.5 hectare in extent were mapped by walking the perimeter of the stand and recording waypoints at intervals.

Most stands were photographed, and a short description provided, e.g. "small stand on crag", "single tree on roadside". More detailed information was also collected for some stands using a recording sheet.

In the course of the survey, a number of Aspen were observed in planting schemes. Where it was evident that Aspen were of planted origin or where there was reasonable doubt about the origin, this was noted.

Data collation

All the data were gathered from the surveyors, and entered into an Excel spreadsheet. Some GPS data were downloaded directly from the unit to digital files. Where necessary, alpha-numeric OS grid references were converted to all-numeric format in X and Y columns. These points were then plotted using Mapmaker GIS. The two largest stands were also mapped as polygons.

On the map, planted Aspen are distinguished from those of natural origin by using different symbols.

Some data were also gathered from other sources. These include target note data from a habitat survey of Ness Woods SAC (Jones *et al.* 2007)

Results

In total, 113 Aspen stands were recorded and mapped in the survey area. These are listed in Appendix 1. Detailed information on age classes and status was collected for 27 stands (see example, Appendix 2).

Most stands are less than 0.2 hectare in extent, with many stands comprising only a few trees on crags. At least two stands are larger: Fasnagruig (1.15ha) above Inverfarigaig, and An Doirlinn (0.61 ha) by the R Fechlin. .

Aspen stands were recorded from just above sea-level at Loch Ness to an altitude of over 500 metres a.s.l. where remnant riparian woodlands peter out on the high Monadhliaths. The highest stand recorded is at 531 m a.s.l. This altitudinal range is only matched in South Loch Ness by two other tree species: downy birch and rowan.



Above: A small Aspen stand on a vertiginous slope above Loch Ness

Right: A number of small Aspen stands are found in inaccessible locations at high altitude; this stand is n Glen Markie, a tributary of the River Fechlin, at over 400m a.s.l.



Most Aspen stands are found in areas of long-established broadleaved woodland. It is most frequently associated with birch, rowan, hazel and juniper. Less frequently it is found with ash, oak, goat willow, hawthorn, blackthorn, Scots pine and alder.

Few sites are grazed by domestic stock, but most sites show evidence of browsing by deer.



A few stands occur on land which has been planted with conifers. Although these stands do not appear to have been underplanted with conifers, they are hemmed in and their possible expansion is hampered.

Right: A stand above the Allt Caol has little prospect of expansion until adjacent conifers are felled and grazing levels are reduced



Many of the stands are located on crags, steep slopes, boulder fields and gorges, where aspen suckers experience lower browsing pressure than elsewhere.



Left: Conifers were clearfelled from a large area below Errogie in about 2002, exposing this small stand above Allt na Goibhre

Aspen has also been planted in a few areas. These plantings are shown on the map.

The genetic origin of these plantings is unknown, but most planting material is likely to be of Highland origin.

A diverse flora and fauna has been found in association with the aspen stands surveyed. These include:

Phellinus tremulae

This aspen-dependent bracket fungus is found on several Aspen stands. Its distribution and site requirements are discussed by Jardine & Emmett (2009).

Hammerschmidtia ferruginea

This rare hoverfly depends on Aspen deadwood. It is a priority BAP species. Graham Rotheray and Iain MacGowan observed it at Fasnagruig in 2002, but no attempt has since been made to re-locate it.



Phellinus tremulae, a bracket fungus found only on Aspen



Great Spotted Woodpeckers were noted nesting in holes in Aspen at Allt Caol. Many lichens, mosses and fungi were noted on some Aspens, but only a few species were identified.

Left: Lungwort *Lobaria pulmonaria* on Aspen

Below: Oak fern



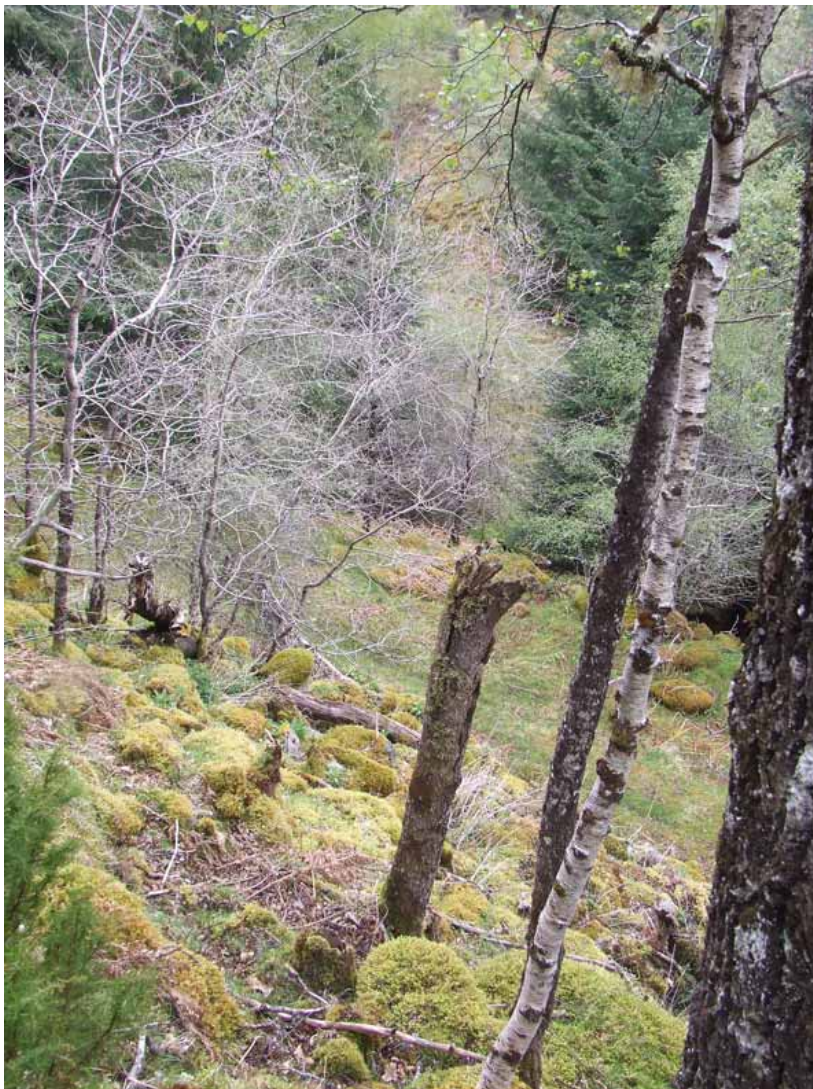
Discussion

Given the extent of the survey area (about 300 km²), the reliance on volunteers who each surveyed their own 'patch' and the remoteness of some Aspen stands, this survey is unlikely to be fully comprehensive. However, it includes the most accessible stands in South Loch Ness, and most of those omitted will probably be small stands on crags.

These data will be entered into a national database of Aspen. This will be viewable at www.scottishaspen.org.uk. This interactive mapping site will be launched in December 2010, and will allow users to add new data online.

During the course of the fieldwork, the surveyors identified a number of opportunities to improve the management of Aspen in South Loch Ness.

Aspen is very palatable to all grazing animals. Suckers also requires good light levels to develop and establish new trees (or 'ramets'). At present, many stands are unable to regenerate and expand, either because of high grazing levels or because they are hemmed in by other trees, whether other broadleaves or conifers. Furthermore, it is only rarely included in new planting schemes.





Two of the largest Aspen stands in South Loch Ness: *Above:* Fasnagruig (1.15 ha) on land managed by Forestry Commission Scotland. *Below:* An Doirlinn (0.61 ha) on Dell Estate



Recommendations for action

Efforts are currently being made to improve the restoration and management of Aspen woodland in Highland, especially in the Glen Affric area and Strathspey. Work in South Loch Ness could ultimately help link these two core areas of activity.

The following actions would benefit Aspen and its dependent species in South Loch Ness:

- expand existing Aspen stands by 'halo-felling' and managing browsing levels
- include local-origin Aspen in new plantings
- link Aspen stands with new planting of Aspen-rich woodlands to create networks of Aspen habitat
- create deadwood in suitable stands for saproxylic invertebrates, especially *Hammerschmidtia*.

Given the visitor numbers in the area, there is also scope for raising awareness of Aspen by including an account of its importance in any interpretation being developed.

The main opportunities for interpreting native woodlands are at Inverfarigaig and at the Falls of Foyers.

Proposals for management have already been discussed with some owners. These include a site meeting with FCS staff to discuss management of the stand at Fasnagruig.



Where Aspen has been planted in recent new native woodland schemes, it has performed well. If local-origin planting material were more readily available, it would certainly be a more popular choice with foresters.



The supply of naturally-fallen Aspen deadwood at Fasnagruig is probably inadequate to securely sustain a population of *Hammerschmidtia*. Some intervention could provide biodiversity benefits.

References

- Jardine, D.C. & Emmett, E.E. (2009). The distribution and ecology of *Phellinus tremulae* in the Scottish Highlands. In: Parrott, J. & MacKenzie, N. eds. *Aspen in Scotland: biodiversity and management*. Proceedings of a conference, Boat of Garten, Scotland, 3-4 October 2008. Highland Aspen Group.
- Jones, T., Jones, G. & MacKenzie, N. (2007). Habitat survey of Ness Woods SAC. Commissioned Report No. 229, Scottish Natural Heritage, Inverness.



Poplar Hawkmoth larva on a young planted Aspen by the River E

Acknowledgements

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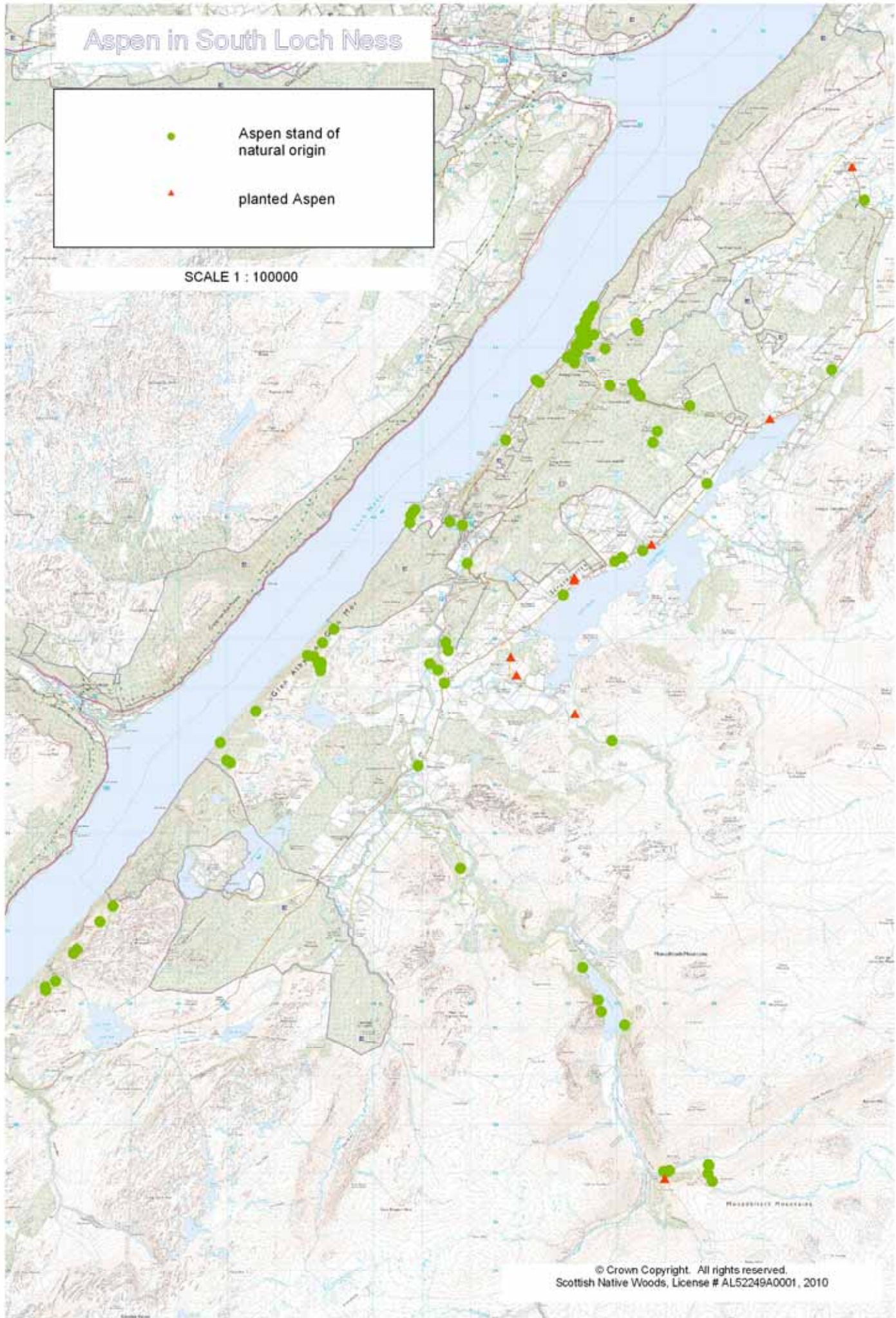


Aspen in South Loch Ness

● Aspen stand of natural origin

▲ planted Aspen

SCALE 1 : 100000



Appendix 1

ID	GR	X	Y	Location	Recorder	Notes
N001		241479	810959	Easter Ness SSSI	Gus & Tess Jones	
N002		241282	810768	Easter Ness SSSI	Gus & Tess Jones	On crag.
N003		241278	810836	Easter Ness SSSI	Gus & Tess Jones	
N004		241857	811525	Easter Ness SSSI	Gus & Tess Jones	With Scots pine in gorge.
N005		241927	811602	Easter Ness SSSI	Gus & Tess Jones	With Scots pine in gorge.
N006		242661	812506	Easter Ness SSSI	Gus & Tess Jones	Large standing & decumbent trees and suckers.
N007		242393	812187	Easter Ness SSSI	Gus & Tess Jones	<i>Lobaria pulmonaria</i> (lungwort) on aspen.
N008		244990	815499	Easter Ness SSSI	Gus & Tess Jones	On crag.
N009		244865	815859	Easter Ness SSSI	Gus & Tess Jones	With Scots pine, oak, willow and rowan.
N010		245061	815446	Easter Ness SSSI	Gus & Tess Jones	With Scots pine, juniper and the moss <i>Ptilium crista-castrensis</i> on crag.
N011		245076	815446	Easter Ness SSSI	Gus & Tess Jones	With juniper and maidenhair spleenwort <i>Asplenium trichomanes</i> on cliff.
N012		245596	816511	Easter Ness SSSI	Gus & Tess Jones	With holly and <i>Ptilium crista-castrensis</i> .
N013		246920	817437	Easter Ness SSSI	Gus & Tess Jones	Several aspen on cliffs over fairly extensive area.
N014		246930	817512	Easter Ness SSSI	Gus & Tess Jones	Several aspen on cliffs over fairly extensive area.
N015		246930	817471	Easter Ness SSSI	Gus & Tess Jones	Several aspen on cliffs over fairly extensive area.
N016		246965	817919	Easter Ness SSSI	Gus & Tess Jones	Several trees of different ages on steep ground.
N017		246873	817487	Easter Ness SSSI	Gus & Tess Jones	On crags.
N018		246785	817636	Easter Ness SSSI	Gus & Tess Jones	Single tree.
N019		246649	817656	Easter Ness SSSI	Gus & Tess Jones	Broom regen and aspen on steep slope with W17. Aspen extensive near r
N020		246928	817344	Easter Ness SSSI	Gus & Tess Jones	Mature tree.
N021		247193	818196	Easter Ness SSSI	Gus & Tess Jones	With sessile oak.
N022		253397	824467	Inverfarigaig SSSI	Gus & Tess Jones	With juniper and Scots pine.
N023		253445	824335	Inverfarigaig SSSI	Gus & Tess Jones	Mature trees and regeneration.
N024		253408	824489	Inverfarigaig SSSI	Gus & Tess Jones	
N025		252348	824102	Inverfarigaig SSSI	Gus & Tess Jones	
N026		252333	824150	Inverfarigaig SSSI	Gus & Tess Jones	
N027		252328	824065	Inverfarigaig SSSI	Gus & Tess Jones	Some accessible trees damaged by deer.
N028		252349	824384	Inverfarigaig SSSI	Gus & Tess Jones	With holly; browsed regeneration.
N029		252761	823968	Inverfarigaig SSSI	Gus & Tess Jones	With Scots pine, rowan, birch and regenerating Sitka spruce nearby.
N030		252366	824173	Inverfarigaig SSSI	Gus & Tess Jones	With juniper, ivy and hawthorn on ledge.
N031		252322	824093	Inverfarigaig SSSI	Gus & Tess Jones	With Scots pine nearby.
N032		252337	824118	Inverfarigaig SSSI	Gus & Tess Jones	Fairly extensive area of aspen - continuous with N031
N033		252367	824222	Inverfarigaig SSSI	Gus & Tess Jones	
N034		253484	822990	Inverfarigaig SSSI	Gus & Tess Jones	With hawthorn nearby.
N035		253460	823005	Inverfarigaig SSSI	Gus & Tess Jones	With hawthorn nearby.
N036		253390	823088	Inverfarigaig SSSI	Gus & Tess Jones	With hawthorn nearby.
N037		253377	823113	Inverfarigaig SSSI	Gus & Tess Jones	With hawthorn nearby.
N038		253322	823250	Inverfarigaig	Gus & Tess Jones	Growing among boulders.
N039		251899	818902	Lochgarthside	Neil MacKenzie	Line of mature aspen along roadside.

ID	GR	X	Y	Location	Recorder	Notes
N039		251899	818902	Lochgarthside	Neil Mackenzie	Line of mature aspen along roadside.
N040		252123	819187	Lochgarthside	Neil Mackenzie	4 young aspen (planted)
N041		252135	819237	Lochgarthside	Neil Mackenzie	Aspen suckering into field; 1 young (planted) aspen on field bound.
N042		257829	827677	Torness	Neil Mackenzie	3 young aspen; origin unknown
N043		252620	810567	Creag Eigin	Neil Mackenzie	Below crags; various ages.
N044		252305	811239	Loch Killin	Jane O'Donovan	Young aspen in enclosure with birch regen
N045	NH529159	252900	815900	River E	Neil Mackenzie	by waterfall
N046	NH5223324090	252233	824090	near Inverfarigaig	Rosemary Holt	
N047	NH5227124125	252271	824125	near Inverfarigaig	Rosemary Holt	
N048	NH5227424195	252274	824195	near Inverfarigaig	Rosemary Holt	
N049	NH5233424434	252334	824434	near Inverfarigaig	Rosemary Holt	
N050	NH5237124507	252371	824507	near Inverfarigaig	Rosemary Holt	
N051	NH5243724630	252437	824630	near Inverfarigaig	Rosemary Holt	
N052	NH5249024754	252490	824754	near Inverfarigaig	Rosemary Holt	
N053	NH5252924840	252529	824840	near Inverfarigaig	Rosemary Holt	
N054	NH5241224665	252412	824665	near Inverfarigaig	Rosemary Holt	
N055	NH5235124536	252351	824536	near Inverfarigaig	Rosemary Holt	
N056	NH5235124536	252351	824536	near Inverfarigaig	Rosemary Holt	
N057	NH5225624359	252256	824359	near Inverfarigaig	Rosemary Holt	
N058	NH5253024259	252530	824259	near Inverfarigaig	Rosemary Holt	
N059	NH5234024070	252340	824070	near Inverfarigaig	Rosemary Holt	
N060	NH5234024113	252340	824113	near Inverfarigaig	Rosemary Holt	
N061	NH5239724095	252397	824095	near Inverfarigaig	Rosemary Holt	
N062	NH5219323919	252193	823919	near Inverfarigaig	Rosemary Holt	
N063	NH5213723685	252137	823685	Fasnagraig	Rosemary Holt	large stand on FCS land
N064	NH5216223934	252162	823934	near Inverfarigaig	Rosemary Holt	
N065	NH5219423890	252194	823890	near Inverfarigaig	Rosemary Holt	
N066	NH5219423890	252194	823890	near Inverfarigaig	Rosemary Holt	
N067	NH5208423836	252084	823836	near Inverfarigaig	Rosemary Holt	
N068	NH5134023317	251340	823317	near Inverfarigaig	Rosemary Holt	
N069	NH5141423265	251414	823265	near Inverfarigaig	Rosemary Holt	
N070	NH5217724047	252177	824047	near Inverfarigaig	Rosemary Holt	
N071	NH5374122040	253741	822040	Allt na Caol	Valerie Weir	good stand on boulder field above track
W02		254850	821201	Lyne of Gorthleck	John Parrott	small stands by track and church
W03		253713	819920	Gorthleck	John Parrott	planted in front of school, P1994
W04		253531	819819	Gorthleck	John Parrott	small stand in garden (Larch Cottage)

ID	GR	X	Y	Location	Recorder	Notes
W05		253102	819672	Gorthleck	John Parrott	young trees, community hall car-park
W06		252960	819593	Gorthleck	John Parrott	small stand in gardens
W07		250826	817593	Garthbeg	John Parrott	planted in NNW
W08		250945	817226	Garthbeg	John Parrott	planted in NNW
W09		252140	816422	Garthbeg	John Parrott	planted in front of hydro powerhouse
W10		248925	815382	Whitebridge	John Parrott	on right bank of R Fechlin by bridge
W11		249465	817089	between Drumtemple	John Parrott	by church and Allt an Loin
W12		249540	817761	Glenlia road	John Parrott	few trees on crag above road
W13		249498	817928	Glenlia road	John Parrott	small stand among conifers
W14		249934	819556	above Glenlia	John Parrott	small stand by road
W15		249835	820335	Glenlia	John Parrott	by road
W16		250721	822087	below Boleskine Hous	John Parrott	small stand by road
W17		251983	823782	near Inverfarigaig	John Parrott	small stand by road
W18		252026	823806	near Inverfarigaig	John Parrott	small stand by road
W19		252861	823211	Farigaig Pass	John Parrott	small stand on crag
W20	NH5614022497	256140	822497	Old School	John Parrott	planted in front of school, P1994
B02	NH4875220390	248752	820390	Foyers	Brian Yates + Johanna Schuster	
B03	NH4886720657	248867	820657	Foyers	Brian Yates + Johanna Schuster	
B04	NH4882520614	248825	820614	Foyers	Brian Yates + Johanna Schuster	
B05	NH4877420538	248774	820538	Foyers	Brian Yates + Johanna Schuster	
A01		253837	822267	Allt Caol	John Parrott	
A02		254506	822782	near Allt na Goibhre	John Parrott + Valerie Weir	small stand freed by clearfell
A03		257415	823540	E of Errogie	Valerie Weir	by quarry
A04		258087	827023	Torness	John Parrott	by farm track (not GPSd)
A05		249575	820408	Falls of Foyers	John Parrott	few stands along gorge (not GPSd)
A06		249160	817490	along R Fechlin	John Parrott	few stands along river (not GPSd)
F01		249798	813281		John Parrott + Heather Macle	c3 trees roadside
F02		252685	810324	Loch Killin	John Parrott + Heather Macle	on crag above loch
F03		253161	810060	Loch Killin	John Parrott + Heather Macle	on crag above road
F04		253959	807033	Glen Markie	John Parrott + Heather Macle	above burn
F05		254022	807029	Glen Markie	John Parrott + Heather Macle	above burn
F06		254086	807055	Glen Markie	John Parrott + Heather Macle	above burn
F07		254886	807176	Brotten Burn	John Parrott + Heather Macle	above burn
F08		254889	807154	Brotten Burn	John Parrott + Heather Macle	above burn (altitude 477 m asl)
F09		254873	806996	Brotten Burn	John Parrott + Heather Macle	above burn
F10		254964	806832	Brotten Burn	John Parrott + Heather Macle	above burn (altitude 531 m asl)
F11		253988	806868	above Glenlia	John Parrott + Heather Macle	small plantation with sev aspen
POL01		252131	823680	Fasnagruig	John Parrott	large stand among FCS conifers (1.15ha)
POL02		249338	817356	An Doirlinn	John Parrott	large stand by Allt na Loin (0.61ha)

Appendix 2

ASPEN STAND RECORD



Grid ref. (GPS)		Grid ref. (map)		Location		Date	Observer
NH 52233 24090		①		Inverfergus - opposite Hillhead cottages - lower stand		11-5-09	R. Holt
Woodland type	HAP type		Area (ha)	Aspect	Altitude (m)	Soil type	
	NVC comm.		0.06 ha	NW	50m		
Tree species within stand	Species	ASPEN	BIRCH	hazel...	Yew...	
	%	40	40	10	10		
Site type	Cliff/crag	Gorge	Riparian	Scree/boulders	Slope	Other	
				✓	✓		
Aspen growth stages (DAFOR)	Visible regen.	Estab. Regen.	Pole - Immat.	Mature	Veteran	No. aspen stems in stand	
	0	R 1 stem	D 13 stems	F 7 stems		21	
Aspen DBH range (DAFOR)	< 7 cm	7 - 15 cm	15 - 25 cm	25 - 40 cm	> 40	Maximum DBH (cms)	
	R 1 stem	F 3 stems	D 17 stems			23 cms	
Deadwood (no. in each size class)	DBH	10 - 20 cm	21 - 40 cm	41 - 100 cm	> 100 cm	NONE	
	Standing					✓	
	Fallen	1					
Threats + damage (severity scale: 1 - 5)	Browsing	Bark stripping	Felling	Exotics	Windthrow	Bracken	
	3						
	Erosion	Muirburn	Disease/dieback	Vandalism	Fly tipping	Pollution	
	2			1			
Management practices (✓)	Timber	Grazing	Conservation	Game birds	Shelter	Recreation	
	Forest design	Agroforestry	Ornamental	None	Other (specify)		
Clonal composition	If noted, any evidence of clones, from bud burst, flowering, foliage colour + leaf fall Although most stems were at the early pink leaf stage, there were 2 trees at SW end of stand that were at later bronze leaf stage						
Cushion forming bryophytes	None	Sparse	Numerous	Abundant			
Fungi	<i>Phellinus tremulae</i> (tick if noted)			Other fungi on wood			
Invertebrates							
NOTES				GPS waypoints			