Social & Environmental Benefits of Forestry
Phase 2 :

VALUING THE BENEFITS OF BIODIVERSITY IN FORESTS

Report to

Forestry Commission

Edinburgh

from

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April 2002

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1. Introduction

Resources available for Phase 2 of the Non-Market Benefits of Forests programme did not permit any new survey of the general public to assess values for biodiversity in different types of forest.[1] Thus, the biodiversity value of different types of woodland had to be estimated from existing literature and information. No study had sought to value the non-use biodiversity benefits[2] of woodland across all woodland types in Britain. Hence it was necessary to review existing studies of the biodiversity value of woodland and assess how these existing values could be used to derive biodiversity values for different types of woodland.

This Report, on 'Valuing the Benefits of Biodiversity Changes in Forests', first looks at existing studies, and the problems of applying values from these studies across all woodland. It then outlines the approach adopted in this study of using a non-use value for biodiversity from an existing study for one specific type of woodland, and, employing focus groups, identifies how the public's relative values for biodiversity in other types of woodland can be assessed. We also report on an "experts' group", convened to look at the same issue.

2. Existing studies

A number of previous studies have explored the biodiversity value of woodland. These studies have employed different techniques of valuation, and have ranged from valuing a specific species to valuing specific forest habitat types.

The economic approach underlying the UK Biodiversity Action Plan is based setting habitat and species targets and minimising the cost of meeting these targets. This is essentially a ' production function' approach concentrating on 'costs': how much does it cost to maintain, restore, or recreate required habitat areas. Some estimates of the cost of maintaining, restoring, and recreating habitat types are provided by the UK Biodiversity Steering Group (1995). For example, restoration costs for Caledonian pine forest have been estimated at £776/ha/yr (discounted at 6% over 100 years),

[1] The budget for Phase 2 of the Non Market Benefits of Forests only included new surveys to elicit values for recreation and landscape benefits of woodland.

[2] Non-use value because recreation benefits of woodland would include the use values of wildlife in woods. Hence it was important not to double count the same wildlife benefits in both the recreation and biodiversity studies.

although there is tremendous variation depending upon the particular site considered (see Willis *et* al, 1996).

This 'production function' approach based upon mitigating expenditure, or based upon restoration and replacements costs, reveals nothing about the public's preferences and the benefits they receive from biodiversity conservation.[3] The use benefits of biodiversity in forests can be estimated by observing how much people are prepared to pay to travel to see this wildlife. The total value of biodiversity in forests comprises both use and non-use values. Non-use values such as existence value (the benefit people receive from just knowing that wildlife exists even through they never see it) and bequest value (the benefit people derive from knowing that wildlife will be protected and preserved for the benefit of future generations) can only be measured by expressed preference techniques.

This Report on 'Valuing the Benefits of Biodiversity Changes in Forests' concentrates on estimating non-use values. The use values of forests for wildlife are captured in the report on the recreational values of forests. Hence, to avoid double counting of benefits, non-use values of wildlife are the main focus of this study.

A number of studies have employed expressed preference techniques, such as contingent valuation, to estimate people's value for a particular species, such as the red squirrel, that inhabit forests. These studies have tended to focus on the specific habitats or species in a program or policy; that is, on a particular discrete outcome. Thus, Garrod and Willis (1994) looked at the willingness by members of the Northumberland Wildlife Trust (NWT) to pay increased membership fees to support a program to increase different habitat types in general, managed by the NWT, and, in addition, three specific projects that the NWT was contemplating.

On average NWT respondents in Northumberland and Tyne and Wear perceived the most threatened habitats to be broadleaved woodland, followed by traditional hay-meadows, and coastal sand dunes and salt marshes. Habitats associated with conifer forests and large man-made lakes were perceived to be the least threatened habitat. Mean personal preferences for habitats corresponded quite closely with averaged perceived threat to the habitat (r^2 = 0.8514). Personal preferences were low for conifer forest habitat, as Table 1 reveals, but highest for broadleaved woodland habitats.

[3] This approach would only reflect society's 'true' preferences in a perfectly representative democracy, in which a Lindahl equilibrium was achieved. An extremely unlikely event!

Table 1. Expressed preference and WTP for one additional reserve in each habitat by NWT members

Habitat	Perception of habitats that are threatened*	Personal preferences for habitats*	WTP mean#	WTD standard deviation#
Conifer forest	2.37	3.09	0.29	1.17
Broadleaved woodland	19.50	22.22	2.32	4.88
Heather moorland	8.28	12.28	0.67	2.09
Peat bog	9.73	3.98	0.79	2.65
Traditional hay meadow	13.72	10.21	1.44	2.98
Marsh and fen	10.14	5.98	0.68	1.75
Ponds	8.78	9.26	0.85	2.32
Large manmade lakes	2.22	2.59	0.28	1.20
River beds and streams	11.33	12.92	1.05	2.44
Coastal sand dunes and salt marshes	13.01	15.81	1.66	4.56
Total			10.05	16.08

* Respondents awarded points out of 100 for each habitat

In £ per year 1993 prices.

Source: Garrod and Willis (1994).

Table 2 reveals WTP for specific programs of the NWT. Clearly support for elements of biodiversity varies, according to the proportion WTP >0 and by the mean WTP amount for those WTP >0.

Table 2. Expressed preference and WTP by members for specific NWT programs.

Program	Percentage of respondents with non-zero WTP	Mean annual WTP (£) for those with WTP >0
Border mires	39.4	1.47
Red squirrel	77.4	2.94
Headquarters	17.2	2.09

Source: Garrod and Willis (1994).

A study by Macmillan *et al* (1996) derived values for species composition and diversity (plants, including trees, invertebrates, birds, mammals, etc.), but this was in the context of loss of species from acid rain and not changes in forest structure.

Another study by Macmillan and Duff (1998) used a discrete choice CV question, to estimate the value of restoring two native pinewood forests in Affric and Strathspey in Scotland. Mean household WTP for those supporting a particular restoration plan

ranged between £35 for Affric and £53 for Strathspey. The latter figure was reduced when compensation for those who preferred the existing moorland landscape was included.

A further analysis of the Affric and Strathspey data over different project scenarios, including the reintroduction of two wildlife species that had been extinct in native Caledonian pine forests for many years (Macmillan *et al*, 2001), gave rise to the mean estimates of WTP per households per year reported in Table 3. Clearly the inclusion of WTA compensation and the functional form of the model affect the results. The 2000 households in the sample survey were divided equally between the six projects. The study was not exclusively concerned with non-use values for biodiversity in Caledonian native pinewoods, so that the results probably include some use value. The fact that the projects were neither valued sequentially, nor simultaneously, means that the results are difficult to generalize and use in a benefit transfer sense because of the likelihood if embedding bias in the results.

Table 3: Estimated WTP for restoration of native Caledonian pine forest, with reintroduction of particular species.

£s per household per year

Scenario:	*Model 1*	*Model 2*	*Model 3*
1. restoration of 80,000 ha of native forest in Affric	35	35	37
2. restoration of 80,000 ha of native forest in Affric plus reintroduction of the beaver	101	25	67
3. restoration of 80,000 ha of native forest in Affric plus reintroduction of the wolf	31	-2	10
4. restoration of 80,000 ha of native forest in Strathspey	53	24	24
5. restoration of 80,000 ha of native forest in Strathspey plus reintroduction of the beaver	100	19	91
6. restoration of 80,000 ha of native forest in Strathspey plus reintroduction of the wolf	61	-13	41

Model 1 uses WTP data and logistic curve constrained to non-negative
Model 2 uses WTP and WTA data, with unconstrained logistic curve
Model 3 uses WTP and WTA data with slope and break introduced as special covariates
Source: Macmillan *et al*, 2001.

An other study, on the cost-effectiveness of woodland ecosystem restoration, by Macmillan *et al* (1998) presented information on experts' ranking of eleven woodland attributes: five of which related to internal features of the wood and the remainder to landscape ecology. The attributes were: genetic integrity, species composition, tree distribution, precursor vegetation, method of deer control, area of new woodland, area

of surrounding natural woodlands, distance to surrounding natural woodlands, number of surrounding natural woodlands, and area of associated habitat surrounding new woodland. The study showed that whilst grant aid for new woodland was directly linked to the cost of establishment, grant aid was negatively correlated with ecosystem benefits of new woodlands. However, the results were based upon experts' opinions, and benefits were assessed in physical not monetary terms.

Studies investigating the biodiversity value of woodland in the context of other proposed conservation measures are rare. One such study by Hanley *et al* (1996) valued the wildlife benefits of woodland in an agricultural context: how much people were prepared to pay to have native woodland whilst simultaneously paying for the protection of grasslands, moorlands, walls, and archaeology in the Breadalbane ESA in Scotland. The results of this study are tabulated in Table 4, and show the utility of marginal rate of substitution that respondents had for woodland compared to other conservation elements. Clearly respondents valued woodland much more highly than other conservation factors in Breadalbane ESA. The results of Table 4 imply that respondents were willing to pay (WTP) 82p per year for protect woodlands in the context of having to pay to conserve the other features of the Breadalbane ESA.

Table 4: Choice experiment results for Breadalbane

Attribute	*Coefficient*	*'t'-statistic*
Protection of woodlands	0.58	16.0
Protection of archaeology	0.07	2.2
Protection of moorlands	0.26	7.5
Protection of grasslands	0.24	6.8
Protection of walls	0.13	3.8
Tax	-0.007	8.2

Chi-square = 507.95; log-likelihood (unrestricted) = 1281.56; n = 4440
Source: Hanley, Nick, I. Simpson, R. Wright, D. Macmillan, C. Bullock and R. Crabtree (1999).

The Hanley *et al* (1999) study adopts the appropriate framework necessary to value biodiversity in different types of woodland. It simultaneously values woodland biodiversity in relation to other calls on expenditure. Valuing biodiversity across different woodland types, of course, also requires the simultaneous valuation of different woodland ecosystems. Unfortunately, the Hanley *et al* (1999) results cannot be generalised across Britain to value the biodiversity of all woodland for two reasons. First, the value relates to the conservation of woodland as a whole in the landscape rather than biodiversity aspects *per se*; and second grossing up a value for woodland specific to one location across all woodland in Britain would over-estimate biodiversity benefits because of the embedding problem.

A study by Garrod and Willis (1997) estimated the mean WTP of the public for the non-use biodiversity value of remote coniferous forests in Britain. It estimated the public's WTP for a number of forest management standards that could be adopted to

improve levels of biodiversity in remote upland coniferous forests, which the respondent would never visit. Biodiversity values were assessed in relation to different management standards for this type of forest: 'do nothing' (blanket commercial forestry); a 'basic' biodiversity management standard, that the FC was already moving towards; an 'enhanced' management standard, that would meet UK biodiversity obligations for managed forests, whilst still permitting some timber production; and a 'native woodland' standard, that would maximise biodiversity. The Garrod and Willis study was concerned with the value of marginal changes in biodiversity of remote upland coniferous forests, rather than the total value of biodiversity in remote upland coniferous forests as a whole. The value for increasing biodiversity of these forests at the margin was £0.30 to £0.35 per household per year for a 1% increase in these forests [using a contingent ranking (CR) method]. A contingent valuation (CV) study produced similar results of £10-£11 per household per year for biodiversity for a 30% increase of the area of this forest type.

The use of an existing value or values for biodiversity, to estimate the value of biodiversity across all woodland types, requires the existing biodiversity value to be

(1) a non-use value,
(2) an estimate of value for a generic biodiversity woodland type, rather than the value for a specific forest of wood (to avoid embedding problems),
(3) a study that estimates both the total biodiversity value and the marginal value of an increase in that biodiversity woodland type,
(4) a study that values biodiversity of one woodland type in the context of people's preferences and values for biodiversity in other woodland types, and
(5) preferably a study whose values are already used by the FC and accepted by H.M. Treasury in valuing the non-market benefits of forests in Britain.

No one existing study fulfilled all these criteria. The study that fulfilled the greatest number of these criteria appeared to be that by Garrod and Willis (1997). The value of biodiversity from this study was already employed by the FC in policy evaluation and in local forest management decisions. In addition, this value had already been endorsed and accepted by government departments, including HM Treasury, in appraising the rate of return of forest investment. Hence, this Phase 2 study of the non-market benefits of forests adopted the Garrod and Willis (1997) study as a basis to estimate the biodiversity value of forests across all woodland types. The Garrod-Willis (1997) study assessed the value of improving biodiversity in 300,000 ha of remote coniferous forest, which was largely unvisited by the general public. Results were expressed as WTP for a 1% (3000 ha increase) in biodiversity improvement in these forests. However, this coniferous woodland, which is both visited and unvisited, remote and non-remote, comprises 53% of all woodland in Britain i.e. about 1,215,000 ha. Thus this study asked people to estimate the biodiversity value of additional 12,000 ha increments, which for upland coniferous forest is 1% of the total stock, to maintain consistency with the original Garrod-Willis (1997) study. To simply the task for respondents, and avoid confusion, this 12,000 ha increase was applied across all biodiversity woodland types.

3. Framework of the study and objectives

Thus the framework adopted for estimating the biodiversity non-market benefits in this Phase 2 research project builds upon the biodiversity values derived by Garrod and Willis (1997).

The objective of this Phase 2 non-market biodiversity benefit study of woodland is to

- ascertain non-use biodiversity values for other types of forest, in addition to that for remote coniferous forest, and to

- estimate the (marginal) biodiversity value of additions to these forests, in terms of extending their area.

Marginal values are an important management tool to assess changes in the structure of woodland areas, and also additions to woodland acreage.

The research was designed so that the results of the Garrod-Willis study could be used to estimate the biodiversity value of the remaining forest area in Britain, which has different biodiversity characteristics from remote coniferous forest. This was undertaken by the use of in-depth research on people's preferences for biodiversity and wildlife conservation in other types of forest. As previous authors have noted (e.g. Spash and Hanley, 1995), biodiversity is a complex issue that may not be especially suited to valuation using normal questionnaire techniques. Instead, we used a focus group based approach. In each group, participants had the chance to learn about biodiversity in forests before being asked to express their preferences.

4. Biodiversity woodland types

Meetings with FC staff, including FC ecologists, identified biodiversity types that characterise woodland in Britain. Six types were identified:

1. upland conifer forests: medium and large scale conifer forest with clear felling
2. upland native broadleaved woodland: small scale ancient woodland
3. upland new native broadleaved woodland
4. lowland conifer forest: medium and large scale conifer and mixed conifer and broadleaved forest
5. lowland ancient semi-natural broadleaved wood
6. lowland new broadleaved native woodland

The information sheets developed for these forest types are included as Appendix A. However, we can summarise here by saying that for each forest type, we provided a short verbal description of what the name meant, and an indication of how much of that type was found in the UK. For instance, for **upland conifer forest** we told participants:

- This is a medium-size (100 hectares) to large-size (1000 hectares) conifer forest.
- They tend to be sited in the uplands, on the hills, foothills and in valleys.
- They tend to be managed with a "clear-felling" system of harvesting with large areas being felled at once, but there are areas of un-felled forest, and small areas of clear felling.
- Tree species are Scots pine, Sitka spruce, larch, Norway spruce and Douglas fir. Ground vegetation is only well developed in a few older stands - these being of higher priority for conservation than open areas.
- They cover 1,215,000 hectares which is 53% of all woodland in Britain.

There were clearly some shortcomings with this selection of forest types. For example, in Scotland upland native pinewoods are an important part of natural capital, but these are not specifically mentioned as a separate type for the focus groups, because of the desire to limit the study to 6 types (see report on expert group, Appendix C).

The purpose of the six-biodiversity-woodland descriptors in Annex A was to assist focus group participants to make an objective comparison between the different forest types. As biodiversity is a complex concept, and as the information sheets were to be used with members of the general public, we decided to restrict attention to three aspects of biodiversity for each forest type:

- The average number of species found in each forest type, for the following typology: birds, mammals, invertebrates, plants and fungi;
- Within each of these total, how many of these species were rare
- Characteristic species

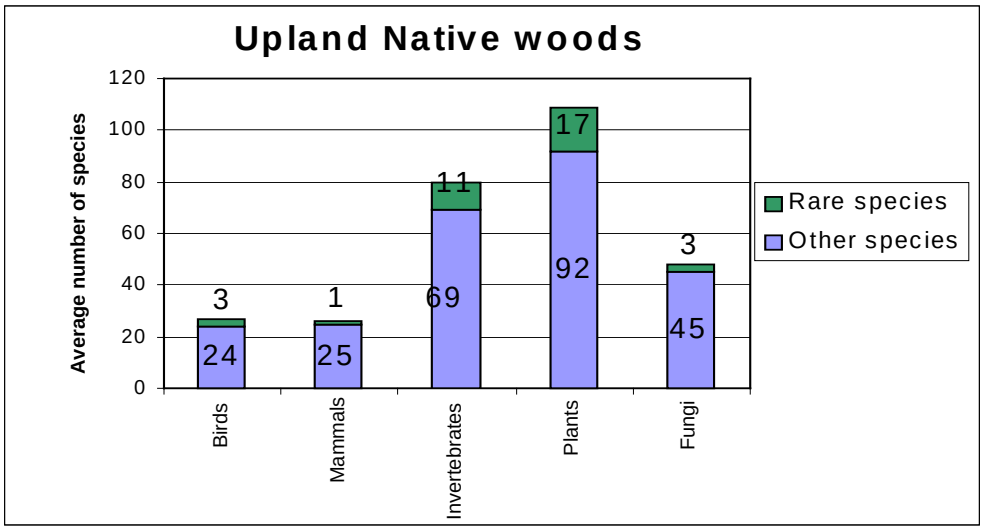
This information was shown both as bar charts and in a table. In addition, we provided colour photos of both the forest type, and the characteristic species. For upland native broadleaved woods, for instance, the information given is shown below on the next page.

Clearly, alternative descriptions of what biodiversity "is" for these forest types might change people's preferences for alternatives. It is also true that not all experts will agree with data we supplied in these information sheets (cf the expert group views in Appendix C). However, we felt that our portrayal of biodiversity was both reasonable and understandable to the general public.

Biodiversity will vary in different woodlands according to

- the type of woodland (conifer, broadleaved, etc).
- the age, climate, geomorphology, and hydrology, covered by woodland of that type.

Thus comparing biodiversity value of 5000 ha of new lowland woodland with 400,000 ha of new woodland is problematic because the latter will always score more highly ecologically, as more site types and climatic regimes are covered and intrinsically more species will be recorded. To avoid this problem a typical woodland stand of each type was imagined, and an estimate provided of the average number of species that might be found in them, based on a sample size of about 5-10 stands per forest type (for stand types for which the FC had ecological data).



Species group	Number found in this forest	Characteristic species
Birds	27	Redstart
Mammals	26	Pole cat, wild cat
Invertebrates	80	Chequered skipper, rannoch sprawler
Plants	109	Lungwort lichen, wood anemone
Fungi	48	Mycorrizal fungi

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5. Focus groups

5.1 Design and conduct[4]

An initial design of the focus group procedure was drawn up. This was then piloted at a "trial" focus group, held in Falkirk in October. This trial proved very useful in terms of simplifying wording, improving the information sheets, and clarifying procedures. A series of focus group meetings was then organised with the general public, using the revised procedure. Seven general public focus groups were held: four in England, one in Wales, and two in Scotland. There were eight participants per group. Details

[4] A transcript for all groups, plus instruction sheets and response sheets are included as Appendix B.

of the location of these groups, numbers of participants, and social group of each participant, are presented in Table 5.

Table 5: Location and composition of general public focus groups

			Social class			
Location	A	B	C1	C2	D	E
Birmingham		4	4			
Bridgend[1]				3	3	2
Croydon		4	4			
Manchester/Worsley				3	3	2
Newcastle	1	4	1		2	0
Dalgety Bay[2]		3	3	2		
Lochgelly[2]		4	4			

[1] Welsh focus group; [2] Scottish focus groups [although the Scottish focus group locations are spatially close, they represent different social groupings. Lochgelly is a working class area in central Fife, whilst Dalgety Bay is a new development populated by Edinburgh commuters].

The focus groups were all moderated by Dr Maggie Anderson from the University of Glasgow, with assistance from Nick Hanley at the Scottish groups and Neil Powe at the English and Welsh groups. Participants at the focus group meetings were reminded that the study was concerned with the participants' non-use biodiversity values for forests, and was not concerned with their preferences and values for forest recreational visits, landscape, and other characteristics of forests such as values for timber production. Each group member was paid £20 for participating. Groups lasted for around 2 hours, and were held in a mix of venues. Focus groups either looked at all three upland forest types; or at all three lowland types, plus the upland conifer forest as a control.

The focus group procedure can be summarised as follows:

STEP ONE: the moderator introduced herself, and talked briefly about the nature of the research project. She also stressed that we were interested in ordinary peoples' views on how important different kinds of forest were in terms of biodiversity, a very simple explanation of which was then provided.

STEP TWO: the moderator then handed out the information sheets. In upland groups, this was sheets on three forests. In lowland groups, sheets on lowland forests plus the upland conifer forest sheets as a control were handed out. Participants were then "walked through" the information sheets by the moderator.

STEP THREE: the group was divided into smaller sets. Each set looked at a particular forest type. They were asked to discuss what were the good points and bad points about each type, from the point of view of biodiversity, using the information sheets. Good points and bad points were written onto different colour post-it notes, and stuck to a flip chart. Each set chose a spokesperson, who then reported back to the whole group on the results of the discussion by reading out the post-it notes.

STEP FOUR: The group re-convened as a whole, and was asked to divide 100 tokens across each of the forest types according to their relative value for biodiversity, using the post-it notes as a summary of views. The moderator moved the tokens around until the majority were content. People were told that they would have the chance to cast their own, private "tokens vote" at the end of the session. The group could choose any allocation they wanted. The moderator pointed out the implication of particular outcomes to the group (eg no tokens for forest A implies a group view that they placed no importance on the biodiversity in forest A). These token scores were then recorded. The group was then asked to repeat the task for a 12,000 hectare increase in each forest type (as distinct from the current situation).

STEP FIVE. The step elicited relative willingness-top-pay (WTP) values. The group was told about the results of the Garrod-Willis study, and asked to express a WTP value, as a group, for a 12,000 ha. increase in the area of each forest type, relative to the Garrod-Willis value. The exact wording used was as follows:

> "A previous study of the general public in the UK asked people whether they would be willing to pay for the costs of increasing the area of upland conifer forests (forest number 1) by 1%, or 12,000 hectares, Remember that a hectare is roughly equal to a football pitch. Taking into account those folk who were not willing to pay anything at all for this increase, the average "value" the study came up with was **35p per household per year**. Think about this as the "value" people in the study put on having an extra 12,000 hectares of upland conifer forest, together with the biodiversity that you find in these forests (which you have been talking about). It's quite a small number because a lot of people did not put any value on increasing this kind of forest."
>
> "We would now like to ask you **how much more (or less!) valuable** a similar increase in the other two/three forests we have been thinking about would be to you in terms of the biodiversity they contain, compared to this £0.35 for upland conifers. Remember we are only thinking about the value of forests for biodiversity, and not for timber production or anything else. Can you complete the following table as a group? You will get the chance to do this individually at the end."

In answering this question, the groups collectively filled out a table of values. These are shown below:

For the lowland groups:

Forest	*Increase in area*	*What's it worth for the biodiversity this provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Lowland conifers	Planting 12,000 hectares, which is about a 3% rise	??
Lowland ancient semi-natural	Protecting/re-generating 12,000 extra hecatres, which is also about a 3% rise	??
Lowland new native woods	Planting 12,000 hectares, which means more than doubling the existing area	??

For the upland groups:

Forest	*Increase in area*	*What's it worth for the biodiversity this provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Upland native broadleaves	Planting 12,000 hectares, which is a 4.5% increase	??
Upland new native woods	Planting 12,000 hectares, which is just less than a 50% increase	??

Again, people were told that they would be able to express their private views at the end. All relative values were thus collected for a 12,000 ha. increase. In this sense, this project defines a "marginal increase" in any forest type to be equal to 12,000 ha. This is clearly a significant change for some forest types, such as new native lowland woods.

STEP SIX: Individuals were given a response form, which asked for their individual "token votes", and their individual WTP values. These were then collected in, and respondents were paid and thanked. This ended the focus group.

Further details of the discussions in each focus group can be found in Appendix B.

5.2 Focus Group Results

Transcriptions show that participants found it hard at first to focus just on the biodiversity aspects of forests. In step 3, people referred to many other attributes as important, despite the best efforts of the moderator. These other attributes included:

- timber production
- employment

- absorbing pollution (Birmingham group)
- access and recreation (eg “a nicer environment to walk in”)
- landscape quality (eg “this forest would look attractive in winter)
- stopping housing development (LNBW: “..stop the area being built up”)

Main <u>positive</u> points identified for each forest were:

Upland Conifer:
- a large number of fungi;
- rare fungi (2 groups),
- red squirrels (2 groups), one mentioned these rare compared with greys,
- bugs and plants in correct ratio,
- goshawks good ;
- fungi a good thing, this forest has lots;
- smells good (!).
- appealing species
- Also of interesting note is that one group thought this forest good as it had *fewer* birds.

Upland New Broadleaved:
- more plants and fungi,
- there for the future,
- could become sanctuary for rare species;
- open areas increase birds of prey,
- plants grow well;
- more balanced and in harmony with nature than upland conifer;
- greater mixture of tree species;
- more rare birds

Upland Native Woods:
- old woods,
- interesting species,
- more natural looking;
- lots of birds and mammals;
- most beautiful;
- wildcats;
- highest diversity,
- very natural;
- attractive in winter;
- Robin Hood image;
- ground vegetation better developed;
- more plant species

Lowland Conifer:
- heather and fungi liked,
- more diverse range of animals than upland equivalent;

Lowland New Broadleaved Woods:

- flowers and plants, esp. primroses;
- liked the trees here;
- looks more natural;
- more flowers,
- more diverse range of animals;

Lowland Ancient Broadleaved Woods:
- most favoured;
- bats and rare breeds;
- bluebells;
- important protected plants;
- good for birds/many bird species;
- distinctive fauna;
- ancient;
- encourage plants which have been around for a long, long time;
- more romantic;
- "what makes us English".

Main <u>negative</u> points were:

Upland Conifer :
- most land but least species;
- fewer bird species;
- trees too uniform,
- too much fungi;
- doesn't encourage new plants or species;
- not much biodiversity;
- artificial looking;
- the purpose of this forest is to produce timber, not wildlife

Upland New Native:
- number of insects (too many!)
- not so many animals

Upland Native Broadleaves:
- needs looked after;
- costs of protecting;
- don't like wildcats;

Lowland Conifer:
- doesn't allow rare plants to grow;
- lacks variety;

Lowland New BW:
- not enough of it (such a small fraction of land area);
- have to be very patient;
- less attractive than ancient in terms of species mix (preferred red squirrels to voles);

- not many animals;
- generally not very appealing;

Lowland Ancient BW:
- not enough of it;
- takes ages to get more

Other relevant comments included:
- that fungi could be seen as both a bad thing and a good thing; for instance, the Welsh group saw them as dangerous to kids. This group also disliked insects.
- the Newcastle group did not seem to like the birds in some forest types
- that the forests weren't all that different in terms of biodiversity (two groups)
- that could improve Upland Conifer by mixing in "broadleaves in little pockets"
- people in the London groups weren't so bothered about biodiversity in upland forests as it was further away
- that farmland might be preferable to forestry
- investing in biodiversity is investing for the future (need for altruism)
- big value on protecting trees in greenbelt (Wales)
- would be WTP more if access also improved
- biodiversity not important when a war is on
- one group asked for more information on how equally these species are distributed within a given forest type.

Token scores

In this exercise, the group allocated 100 tokens between the forest types they were considering; first with respect to the current areas of each type, and second with respect to a 12,000 ha. increase in each type, both in terms of the relative importance of biodiversity in each type.

Some general comments are in order here. First, groups seemed to find it relatively simple to accept the idea of using tokens to indicate relative values, both for current areas and for increases in areas. Obviously, there was usually disagreement within each group about what the group decision should be on counters, but in all cases a group decision was eventually reached. Telling participants that they would have a chance to register their own personal "counters score" at the end of the exercise was probably helpful in this regard. With respect to current areas, many groups felt it was important to maintain a balance of forest types, and so to allocate at least some tokens to each type they were assessing.

Group scores for the allocation of 'tokens' in respect of biodiversity preferences for the existing forest area are reported in Table 6.

Table 6: Group token scores for biodiversity in existing forest areas

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
London	20	20	30	30			
Bridgend					33	33.5	33.5
Newcastle					10	40	50
Birmingham	20	20	20	40			
Dalgety Bay	20	20	30	30			
Manchester					30	30	40
Lochgelly					10	30	60
MEAN	20	20	27	33	21	33	46

As may be seen, ancient woods score highest in each setting (upland, lowland). The upland conifer "control" scores almost identically whether used in the lowland or upland groups. Lowland new native and upland new native score higher than their "blanket forest" equivalents, but lower than their ancient equivalents.

For increases in the current area, some of the main views expressed were:

(i) hard to increase ancient woodland: the moderator responded to this by saying we were thinking about an increase in the area protected from threats. This seemed to work. This was explained to all groups.

(ii) a 12,000 ha. increase in upland conifers is proportionately, very small

(iii) new native woods should be especially favoured; in the lowlands, this was thought by some to be a good way of defending the greenbelt.

(iv) In general, the view that the number of counters should depend on both how valuable the forest type was for biodiversity, but also on how much of it there is at present.

Overall group scores in respect of increasing forest area are reported in Table 7.

Table 7: Token scores for 12,000 ha. increase in woodland types

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
London	10	20	30	40			
Bridgend					20	40	40
Newcastle					0	40	60
Birmingham	0	0	100	0			
Dalgety Bay	10	10	40	40			
Manchester Worsley					25	30	45
Lochgelly					10	40	50
MEAN	6.6	10	57	27	14	37	49

Comparing these scores with the previous table we find that differences emerge. Increases in lowland new native broadleaved woods are seen on average as more important than increasing protection of their ancient equivalent, although this only holds for one group out of three. In the uplands, the opposite pattern emerges, with increasing (protection of) existing native woods is valued more highly than planting new native woods in the upland. Increases in both upland and lowland conifer get very low scores.

It is interesting to compare these group values with those reported by individuals at the end of the focus group session. We give some results on this below:

Table 8: Group versus individual token allocations
8a: existing forest areas

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
Group	20	20	27	33	21	33	46
Individual (mean)	17	19	31	33	19	37	44
Individual mean: scaled*		23	37	40			

* The lowland focus groups had 100 tokens to 'spend' across 4 biodiversity types (including upland conifer as a comparator). The upland focus groups had 100 tokens to 'spend' over 3 biodiversity forest types. To maintain purchasing parity the lowland focus groups tokens have been re-scaled to sum to 100 across the 3 lowland biodiversity forest types.

8b: increases in forest area

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
Group	7	10	57	27	14	37	49
Individual (mean)	7	14	51	28	13	41	43[+]
Individual mean: scaled*		15	55	30			

* See note in Table 8a above. [+] Because a focus group participant in the Manchester group did not indicate a token spend for an increase in forest area, the mean of the upland tokens do not sum to 100.

What emerges is how similar the individual and group scores are. For existing areas, the main changes are an increase in importance for lowland and upland new native. For 12,000 ha. increases, the main changes are to lowland new native (down) and upland ancient (also down). All in all, though, the individual mean and group consensus scores are very close to each other.

Willingness to Pay bids

Some difficulties were encountered in convincing participants of the importance of the Willingness to Pay exercise, but in the end all groups except one (Newcastle) did so. People were, on the whole, comfortable with the notion that having more biodiversity cost money. However, explaining exactly how the Garrod-Willis value was obtained, and what it actually meant, was less easy.

Table 9: Group willingness-to-pay scores

(£ per household /yr for 12,000 ha. increase)

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
London	0.35	0.3	0.63	1.50			
Bridgend					0.35	0.70	0.70
Newcastle					*	*	*
Birmingham .	0.35	0.35	0.50	0.50			
Dalgety Bay Bay	0.35	0.35	1.40	1.40			
Manchester					0.35	0.40	0.50
Lochgelly					0.35	0.75	1.50
Mean	0.35	0.33	0.84	1.13	0.35	0.61	0.90

These values show the "marginal" WTP for increases of 12,000 ha. in each of the six forest types, relative to the Garrod/Willis value for upland conifer with a basic biodiversity management standard. In the lowlands, conifers score lowest, with ancient broadleaved forests scoring highest. In the uplands, this picture is repeated. New native woods are less highly valued in both uplands and lowlands than their ancient equivalents, but are about twice as highly valued as conifers.

We can also compare individual WTP scores with group WTP scores. This is shown below in Table 10.

Table 10: Group versus individual WTP

	upland conifer in Lowland groups	*lowland conifer*	*lowland new native*	*lowland ancient*	*upland conifer*	*upland new native*	*upland ancient*
Individual	0.37	0.53	1.44	1.65	0.25	0.75	0.85
Group	0.35	0.33	0.84	1.13	0.35	0.61	0.90

As may be seen, the ranking of forests within the upland or lowland sets is maintained. In stating individual WTP amounts, individuals seem to have slightly increased bids on average, especially for lowland new native and lowland ancient broadleaves.

A final question, mainly of methodological interest, relates to whether there exists a simple linear transformation between token scores and WTP amounts. The answer is no.

6. Expert group

In addition, one expert group was convened. This was run in Stirling University, at the Centre for Environmental History. The group was moderated by Nick Hanley assisted by Alison Dyke, a researcher in the Department of Economics at Glasgow University who is undertaking a PhD on the use of participatory techniques in woodland management contexts.

The aims of the expert group were to:

1. use the same procedures and materials that had been used in the general public focus groups so as to
2. compare reactions between experts and the general public and also to
3. get external feedback on the materials and procedures used.

A full account of the group, including written feedback from some participants, is included as Annex C. Here we summarise the main procedures and findings.

Materials

The group was split in two, and materials for the lowland forest types were given to one half and upland forest types to the other half. After reading through the materials the group felt that

1. the categorisation did not represent the full range of forest types in the UK – particularly the regional variations in ancient forest types, and were curious as to why existing categorisations such as those used for biodiversity action plans had not been adopted.
2. there were many inaccuracies in the information provided.

However, the group did feel that for the general public, to provide information on the number of species of different types, and the number of rare species was appropriate, but characteristic species could have been omitted, especially as this information was thought to be misleading. They also thought that some indication of trends in the rarity (increasing or decreasing) for these species would have been useful, with information on the quality of the biodiversity.

Comparing the expert group responses to those of the general public, on the positive and negative aspects of biodiversity in different types of forest, is perhaps of little value, since the 'experts' group' was expected to be able far more detailed (and far more informed) comments on the advantages and disadvantages of each of the forest type for biodiversity. Experts' views on the positive and negative aspects of the different forest types in biodiversity terms are reported in Appendix C.

Token Scores

As with the general public focus groups, the expert groups was asked to complete an exercise on the relative value of these woodland types for biodiversity, and on the value of increasing these forest types (rather than completing the willingness to pay exercise).

The group was asked to divide 100 counters between the three lowland forest types and the upland conifer type (as the base reference case), according to how they currently valued them for biodiversity. They then considered a situation where the area of these forest types could be increased by **1000 hectares**, and scored according to how much they would value this increase for biodiversity. They then repeated this exercise for the upland forest types. The results of this exercise are shown below in Table 11.

Table 11: Token scores, expert group: Lowland Forest Types

	Existing Situation		Expand by 1000 hectares	
	Participants *a* & *c-f*	Participant *b**	Participants *a* & *c-f*	Participant *b**
Upland Conifer (control)	4		0	
Lowland Conifer	12	30	0	20
Lowland New Broadleaved	17	10	50	30
Lowland Ancient Broadleaved	67	60	50	50

*These values were added <u>after</u> the focus group

As may be seen, the majority view on existing areas gave by far the highest score to ancient broadleaves. This compares with a much more equal split of tokens in the general public sample, although the ranking of forests is the same. Experts gave much lower relative importance to upland conifers and, to a lesser degree, lowland conifers than did the general public. For expanding the area of each, experts gave no points to either upland or lowland conifer, and split the rest equally between new and ancient broadleaves. This contrasts with the general public who placed a higher value on new native woods.

The results of the 'token' exercise for the upland forest types are reported in Table 12.

Table 12. Token score, expert group: Upland Forest Types

	Existing Situation		Expand by 1000 hectares			
	Participants *a* & *c-f*	Participant *b*	Participant *a*	Participants *b* & *c*	Participants *d* & *e*	Participant *f*
Upland Conifer	8		0	0	0	0
Upland New Broadleaved	30		70	40	30	50
Upland Native Broadleaves	62		30	60	70	50

Again, experts differed from the general public in terms of the existing areas of forest, allocating many more tokens to the ancient native woods, and less mainly to upland conifer. In terms of expansion, no group consensus was reached, except in that they wished to give no tokens to expanding upland conifer. Members of the group were then split over which was more important: expanding protection of ancient woodlands in the uplands, or planting new native woods. The reason for this lack of consensus centred on issue of whether enough effort had been made to expand new upland broadleaved woodlands in the recent past, and whether attention should now return to preserving existing upland broadleaved woodlands.

Conclusions

The main conclusions arising from the expert group were as follows:

- it was hard for the group to agree on how best to describe biodiversity in forests, or what was most important about it (although they were agreed in their opposition to elements of the information actually presented to them).
- however, there was a general consensus in the group that information on biodiversity has to be very simple for the general public to understand it
- the group identified a much wider range of advantages and disadvantages for each forest type in terms of biodiversity
- they also identified a number of important themes which seemed missing from the current exercise, for instance the location of new woods
- the groups scoring of forest types in terms of existing areas was very similar to that of the general public, although the number of points allocated to each differed
- the expert group found it harder to reach consensus on expansions of woodland types, except in allocating zero tokens to either upland or lowland conifer

7. General conclusions.

Non-use biodiversity values are particularly difficult to capture. Both CV and stated choice experiments to elicit the general public's values for biodiversity in forests, from questionnaire surveys, have experienced problems in deriving accurate, robust, and reliable estimates. These problems arise for a number of reasons. First, people have widely different preferences for wildlife, so the variance of the mean WTP value is large. Second, people's WTP for biodiversity in British woodland is a very small fraction of income, whilst WTP variation between individuals is mainly driven by taste rather than by income. Because taste is difficult to measure, the variation in

WTP between individuals is difficult to explain. Third, biodiversity is a difficult concept for people to grasp, and people find it difficult to trade-off species importance within fungi, plants, invertebrates, birds, and mammals, and to trade-off species importance between these groups. They also find it difficult to trade-off changes in numbers in a particular species against changes in the number of species represented in a habitat. Summing up, biodiversity is a complex issue over which many people struggle to form preferences. These preferences, once formed, then seem to vary widely.

Focus groups allow people more time to consider and discuss the various aspects of biodiversity in forests, compared with individual responses in a questionnaire survey. More information can also be provided than is typically the case in a questionnaire survey. This is one reason for choosing a focus group approach in this part of the study. However, it is difficult to know how respondents interpreted the information on the information cards. Clearly only a limited amount of information could be portrayed on each card, and the information only provided some indication of the species and diversity found in different types of forest. Respondents probably used a combination of their preconceived notions of biodiversity in different types of forest, perceptions on biodiversity as a result of any visits to different types of forest, and information on the information sheets. Any future study could usefully investigate how people perceive and use information on biodiversity to form preferences for biodiversity conservation.

The focus groups employed tokens and a simple open-ended CV to elicit values and WTP for forest biodiversity. Comparing individual-based measures, the ranking obtained was similar for these two measures for lowland forests, but very different for upland forests. There was no simple transformation between ratings and WTP. This is not necessarily surprising, in that as Roe, Boyle and Teisl (1996) point out, ratings data and willingness to pay data are linked by a transformation function which we know very little about *a priori* for a given population and a given environmental resource. It can be argued that the token results are probably the more accurate and reliable of the two measures, for two reasons. First, respondents spent more time considering the relative merits of different types of forest for biodiversity in the token experiment. Second, many respondents were reluctant to engage in the valuation exercise, and may not have understood it well. We also note that the CV study did (could) not conform to the rigorous standards and procedures recommended by widely accepted authorities on this technique, nor was the CV of sufficient sample size.

Hence the relative values as revealed by the “tokens” exercise, and as summarised in Table 13, can be taken to represent the relative merits and values for marginal increases in biodiversity in different types of woodland.

Table 13: Relative biodiversity values for different types of forest*

Biodiversity forest type	Relative value for existing area	Relative value for an increase[+] of 12,000 ha.	Relative WTP values per household for an increase of 12,000 ha.	Absolute WTP values per household for an increase of 12,000 ha.
Upland Conifer Forest (control)	1.00	1.00	1.00	0.35
Lowland Conifer Forest	1.21	1.15	0.94	0.33
Lowland Ancient Semi-Natural Broadleaved Forest	2.11	2.31	3.23	1.13
Lowland New Broadleaved Native Forest	1.95	4.23	2.40	0.84
Upland Native Broadleaved Woods	2.32	3.31	2.57	0.90
Upland New Native Broadleaved Woods	1.95	3.15	1.74	0.61

[+] Or in the case of ancient lowland and upland native broadleaved woodland to protect and regenerate these woodland types.

*Note. These figures are derived from Tables 8, and 10. The re-scaled individual mean tokens are used to derive the relative value of biodiversity for existing and increases in lowland biodiversity woodland types.

In column 2, the base value is the individual mean (19) for upland conifer in Table 8a, and the other figures for individual means in Table 8a are expressed as a ratio of this upland conifer 'value'.

In column 3, the base value is the individual mean (13) for upland conifer in Table 8b, and the other figures for individual means in Table 8b are expressed as a ratio of this upland conifer 'value', e.g. the lowland conifer forest value is 15/13 = 1.15.

In column 4 the base value is the group mean (£0.35) for upland conifer in Table 10, and the other figures for group means in Table 10 are expressed as a ratio of this upland conifer 'value'.

Column 5 documents the actual WTP amounts as reported in Table 10.

Token allocations by individuals and WTP estimates by groups were used because these were the two exercises of the four exercises (the others being group token and individual WTP) that focus group participants spent the most time deliberating.

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APPENDIX A

INFORMATION SHEETS PROVIDED TO THE FOCUS GROUPS

UPLAND CONIFER FOREST

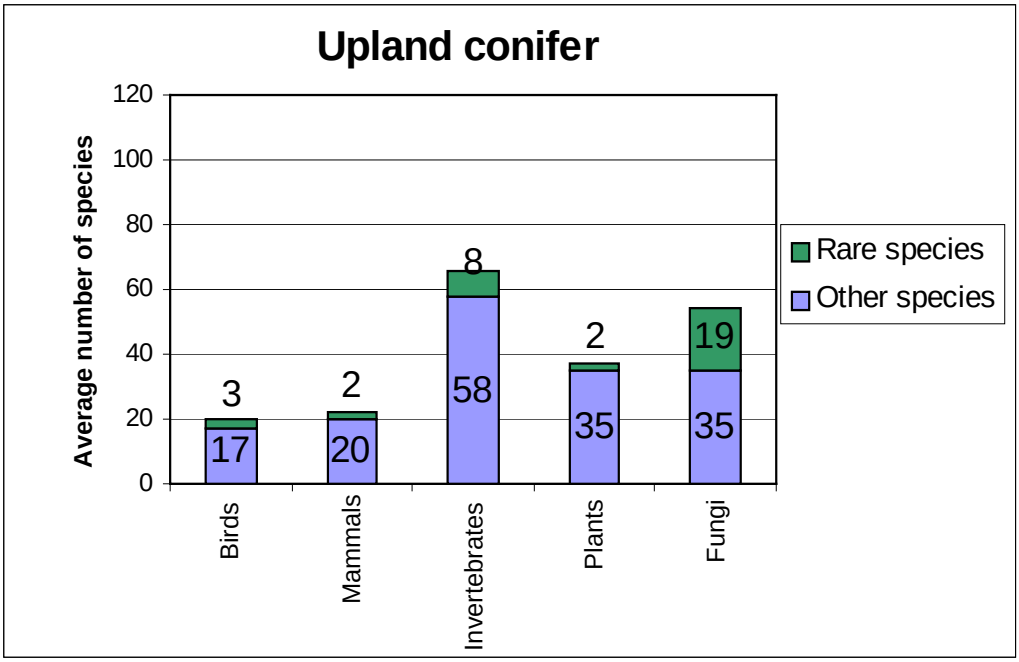
This is a medium-size (100 hectares) to large-size (1000 hectares) conifer forest.

They tend to be sited in the uplands, on the hills, foothills and in valleys.

They tend to be managed with a "clearfelling" system of harvesting with large areas being felled at once, but there are areas of un-felled forest, and small areas of clear felling.

Tree species are Scots pine, Sitka spruce, larch, Norway spruce and Douglas fir. Ground vegetation is only well developed in a few older stands - these being of higher priority for conservation than open areas.

They cover 1,215,000 hectares which is 53% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	20	Goshawk
Mammals	22	Red squirrel
Invertebrates	66	Hoverflies
Plants	37	Liverworts
Fungi	54	Mycorrhizal

UPLAND NATIVE BROADLEAVED WOOD

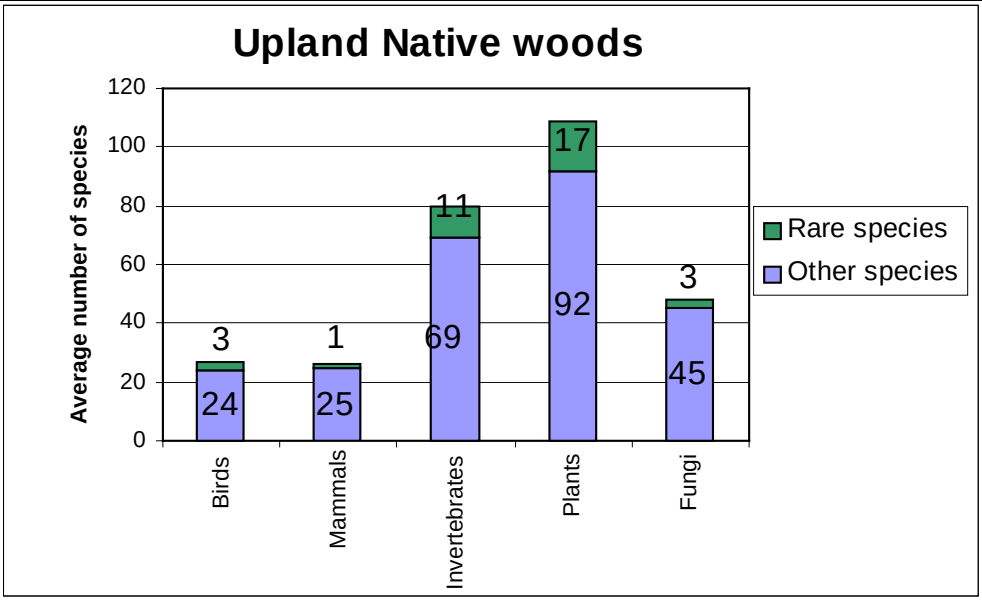
This is a small-scale (5-100 hectares) ancient broadleaved native woodland which has been around since at least 1600.

These woodlands tend to be mostly unmanaged, but can have small areas of felling.

Tree species are native oak, ash, hazel, birch, willows and rowans. Ground vegetation (plants and flowers) is well developed.

They are under threat from a number of reasons, and need to be actively looked after

They cover 270,000 hectares which is 12% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	27	Redstart
Mammals	26	Pole cat, wild cat
Invertebrates	80	Chequered skipper, rannoch sprawler
Plants	109	Lungwort lichen, wood anemone
Fungi	48	Mycorrizal fungi

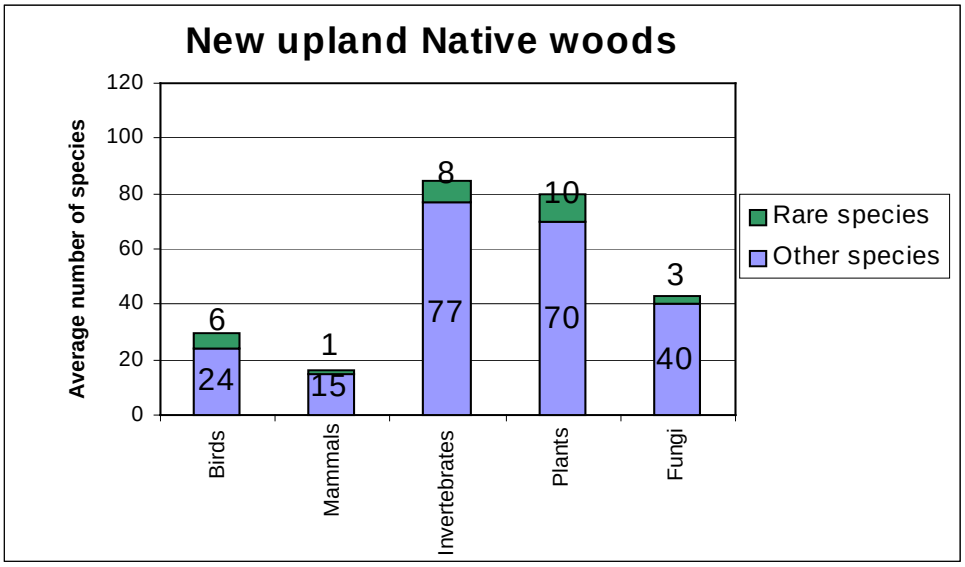
UPLAND NEW NATIVE BROADLEAVED WOODS

This is a small-scale (5-100 hectares) broadleaved native woodland of around 50 years of age.

These woodlands tend to be mostly unmanaged, with small areas of felling.

These native species include oak, birch, rowan and Scots pine. Ground vegetation is less well developed than in older broadleaved native woodlands. Some thickets of native trees are mixed with open areas.

They cover 25,000 hectares which is 1% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	30	Willow warbler
Mammals	16	Mountain hare
Invertebrates	85	Kentish glory
Plants	80	Red campion, wood sorrel
Fungi	43	Laccaria lacata

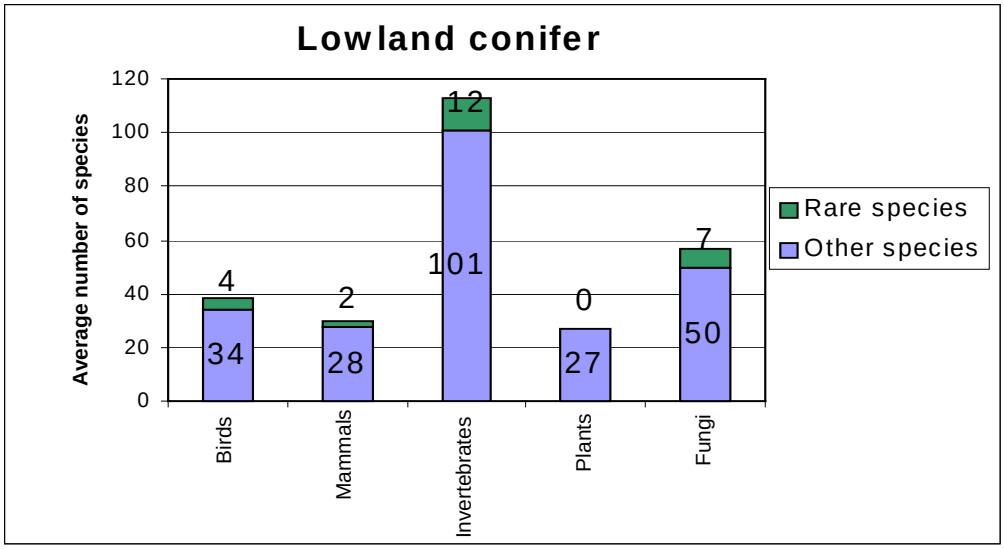
LOWLAND CONIFER FOREST

This is a medium-size (100 hectares) to large-size (1000 hectares) conifer, or mixed conifer and broadleaved forest.

They tend to be sited in or near lowland farmland landscapes
.
They are managed with a clearfelling system of harvesting, but there are some areas of continuous cover and small clear fells.

Tree species are Scots pine, Corsican pine and Norway spruce. Open areas have higher conservation priority than stands.

They cover 370,000 hectares which is 16% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	40	Nightjar, woodlark, firecrest
Mammals	30	Wood mouse
Invertebrates	123	Ground beetle
Plants	27	Heather
Fungi	57	Wood decaying fungi

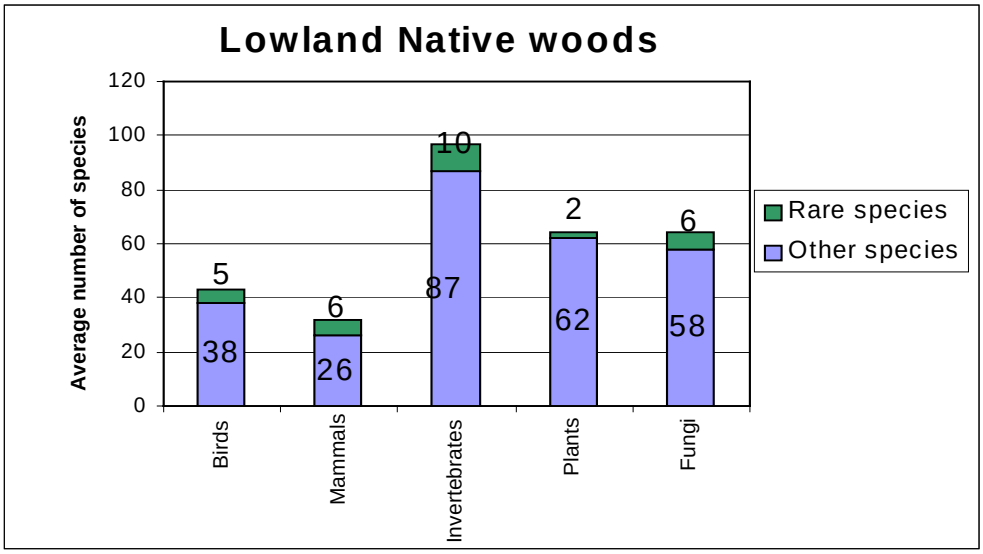
LOWLAND ANCIENT SEMI-NATURAL BROADLEAVED WOOD

This is a small-scale (5-100 hectares) ancient broadleaved native woodland which has been around since at least 1600.

These woodlands are mostly unmanaged with small areas of felling. They tend to be found in arable or pastoral landscapes. They are generally isolated from one another but are sometimes linked by hedgerows.

Tree species are native oak, beech, yew and ash. *Some of these forests are known as "high forest", and they can contain areas* and *wood pasture* with very old trees. These woods have distinctive ancient woodland flora, and many insects live on the old trees and deadwood.

They cover 400,000 hectares which is 18% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	43	Lesser spotted woodpecker
Mammals	32	Dormouse, Bechstein's bat
Invertebrates	97	Stag beetle, purple-hairstreak butterfly
Plants	64	Herb Paris, yellow archangel, bluebell
Fungi	64	Sulphur Polypore

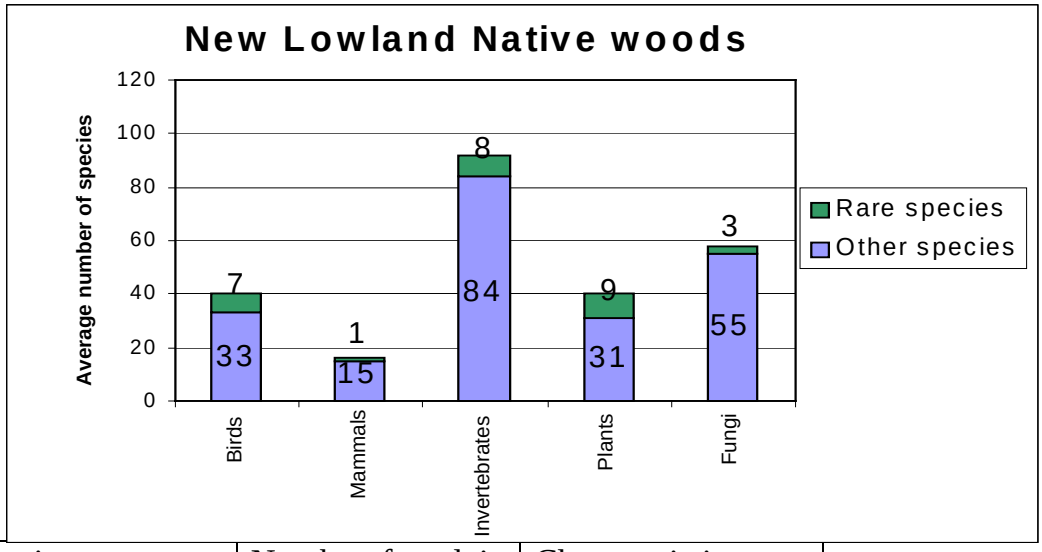
LOWLAND NEW BROADLEAVED NATIVE WOODLAND

This is a small-scale (5-100 hectares) broadleaved native woodland of up to 50 years in age.

These woodlands are mostly unmanaged with small areas of felling. They tend to be more established on land that used to be farmed for arable crops.

Native species are oak and birch. It has a weedier ground vegetation than its upland equivalent and is slower to acquire a typical woodland flora and fauna.

They cover 5,000 hectares which is 0.2% of all woodland in Britain.



Species group	Number found in this forest	Characteristic species
Birds	40	Common whitethroat
Mammals	16	Voles
Invertebrates	92	Black and brown hairstreak butterflies
Plants	40	Primrose, herb robert
Fungi	58	Paxillus involutus

Appendix B

Full details on general public focus groups

INTRODUCTION:

Following discussions with the Forestry Commission it was agreed to run a series of Focus groups throughout Britain to evaluate the general publics regard for the biodiversity within Upland and Lowland woodlands. Focus groups were largely selected using independent recruiters and recruitment questionnaires. The participants were aged between 22 and 55, fell with either B/C1 or C2DE socio-economic groups, and had no association with the Forestry Commission.

To minimise variations and increase accuracy, presentation scripts for Upland and Lowland Woodlands were prepared (appendix 1), with the hope that this would standardise the presentations and ensure each group received the same information.

Cards depicting data and photographs of typical biodiversity contained within either Upland (Conifer, New Native Broadleaf, Native Broadleaf) or Lowland (Conifer, New Broadleaf Native, Ancient Semi-Natural Broadleaf) woodlands were shown to each focus group to help visualize typical species of birds, mammals, invertebrates, plants and fungi within the forests. As much of the information was unfamiliar to the participants it was decided to promote understanding by:

1. *Formally presenting the information on the show cards*
2. *Allowing individuals time to digest the information on their own.*
3. *Promoting discussion within a group environment by asking two groups to lis the good and bad points of each forest.*

It was hoped that following completion of the above, the group would be better placed to attempt an evaluation of the biodiversity supported by each forest.

Upon completion of the above, a group exercise was run to try and place a value on the biodiversity within each forest. This was also run in three stages:

1. *The group was asked to allocate counters to the forests which appealed to them most in terms of biodiversity.*
2. *Next they were asked to re-allocate the counters for an increase in the area of each forest of 12000 hectares (the actual % increase this represented was given). It was explained an increase in area would lead to an increase in biodiversity.*
3. *Finally, the group were told of the previous study on Upland conifers. A script was read out (see appendix 2) and they were asked to put an actual monetary value on increasing the area of each woodland by 12000 hectares relative to a fixed amount (£0.35) for the Upland conifer forest*

Finally, individual responses to each of the above were recorded using a questionnaire (see appendix 1).

PILOT GROUP - FALKIRK OCTOBER:

A pilot study was run in Falkirk before embarking on the seven official Focus groups. This was seen as an appropriate way to test the language and ideas expressed in the scripts and show cards. Not only was this prudent but it proved invaluable as the basic design of the show cards and evaluation exercise did, in fact, cause a great deal of confusion. As a result, several modifications were carried out:

1. Removal of the data on percentages of all woodland species for each group. The group found this difficult to understand and said they would rather analyze the information based solely on the number of species found in each forest.
2. Initially, the evaluation exercise was based on a 5% increase in the area of each forest type. The pilot group quickly noted that because of the disproportionate size of each forest relative to each other that this was a poor question. This was modified (see appendix 2). Subsequent groups were asked to evaluate an increase in area of 12000 hectares (each forest).
3. Some language was simplified to make the data cards more readable.

TRANSCRIPTS OF FOCUS GROUPS AND VALUATION RESULTS - *the following are simplified transcripts of each group discussion and the information written on post-it stickers and presented by the group*

FOCUS GROUP 1 - SOUTH CROYDON, LONDON - LOWLAND FORESTS, 25/10/2001

DISCUSSION POINTS FROM GROUP 1, CROYDON

One of the things the group noted was that over the whole area was there was basically the same pattern of species for each group so that when you look at them, although there was a difference between the forests, the chain was more or less the same.

- **UPLAND CONIFER** - advantages were- it produced natural product (timber) for telegraph poles and things like that and the group felt it was good in the sense that you wouldn't want to see even more man made products in the place of that. They are evergreen and we assumed that would be good in terms of producing oxygen The disadvantage was there were too many of them, too high a % and not enough of the other forests. The other disadvantage is obviously the lack of access as they are fenced off.
- **LOWLAND CONIFERS** - The advantages are it stops development for houses because its in the lowlands and obviously in areas where there could be development. It is protecting the land therefore not a lot to do with biodiversity. The disadvantages it doesn't allow any sort of rare plants to grow.
- **LOWLAND NEW BROADLEAVED NATIVE WOODLAND** - The advantage is it is accessible to everyone. The downside is there isn't enough of them.
- **LOWLAND ANCIENT SEMI-NATURAL BROADLEAVED WOOD** - Does have protected plants such as bluebells, which is good. It has a lot of things we're used to (i.e. English). The only disadvantage is there isn't enough of them because they are competing with farms. We started of preferring broadleaved but we can see the advantages of the others.

OTHER COMMENTS - We understand the reasons for the conifer forests for commercial value but no-one looked at the commercial viability for charging people for walking through forests, trips or something like that on either upland or lowland forests. There was a worry from people about using and destroying the ancient and that sort of thing but we didn't know how to charge. We also noted that things like fungi are actually in all the forests so whatever is done, you are not destroying them. We looked at cards in detail and there are variations but not that many. It didn't seem to make too much difference whether you followed the radical approach of managed forests to the natural way of leaving forests. Managing by man doesn't seem to make too much difference than just letting it be totally natural.

DISCUSSION POINTS FROM GROUP 2, CROYDON

We basically agree with the earlier group but focused more on biodiversity.

- **UPLAND CONIFER** - We all liked the different sorts of wildlife although we all probably agree this forest is a little more inaccessible it's better to have them there. The downside ….This may be something we can't do much about.
- **LOWLAND CONIFER** - Everyone like the heather and the fungi. There wasn't anything we disliked.
- **LOWLAND NEW BROADLEAVED NATIVE WOODLAND** - Everyone liked the flowers and plants, particularly the primroses. On the negative side was the low percentage - we thought 0.2% was very low, tempered by the fact that it might be ….. of the land.
- **LOWLAND ANCIENT SEMI-NATURAL BROADLEAVED WOOD** - Everyone liked the bats and the rare breeds, bluebells, etc. This was probably the favorite forest. It was more easy to access. Everyone liked the native species of trees.

OTHER COMMENTS -

- The other problem, I don't think it's come up too much with trees, but if man tampers with Nature, somewhere along the line, it's going to do something else in. I'm not aware if it's happened with trees but I know it's happened with animals. The only reason it happens say in an Upland conifer forest is because it's financially viable to stick a particular type of tree there. If they were to mix some broadleaf in there, just in little pockets, would you then get a vast increase in some of the species that live there? If you continually clearfell an area, everything's going to move out. If you had these little pockets they are going to stay and you'll probably find there's even larger quantities of different things going to live there. Personally, we noticed that the forest that had the largest proportion of land had the lowest proportion of species which surely really shows it'' the clearfelling or type of land... so surely that's a negative thing.

VALUATION EXERCISE, CROYDON:

	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares
Upland Conifer	20	10	£0.35 / £0.00
Lowland Conifer	20	20	£0.30
New Broad leafed Native	30	30	£0.63 (average of 0.75 and 0.50)
Ancient Semi-natural Broadleaved	30	40	£1.50

GENERAL COMMENTS ON PRESENT SITUATION

The group kept returning to the issue of the Upland conifer forest being a commercial venture. Someone in the group felt that if more money was put into the ancient forests it would spoil it because it would look less natural - however, this individual did state that she would like to see more ancient woodland.

Others in the group pointed out that the price of softwood would increase if you stopped clearfelling. Other participants stated they would be prepared to take away investment in the Upland conifer and would invest the money back into the Ancient woods with the aim of re-introducing hedgerows. There was recognition that some

investment was need in Upland conifer forests to cope with legislation and to keep the price of timber reasonable (five out of 8 participants agreed with this).

INCREASING AREA BY 12000 HECTARES

The following points were raised:

1. Because Ancient B/L take a long time to grow, it will need more money in that area to see an effect in that area, whereas in Conifers you get a benefit within 20 years. It would take a lot of effort and patience to allow New B/L to become Ancient B/L (it was pointed out that New Broadleaved would not become Ancient B/L) and this would be expensive.
2. It was commented on that the New B/L seemed less attractive and it was felt perhaps the pictures provided could have been better. The species presented on the cards also appeared less attractive to the participants. [This highlights the problem that members of the general public have of divorcing aesthetic from biodiversity values]. The participants clearly expressed a preference for Red Squirrels and Goshawks compared to voles and Common White Throats. One participant thought money should be put into New BL because there is going to be less farmland about (especially with recent problems) and the farmers need investment.
3. The participants felt that Upland mainly referred to Scotland - they felt they could relate to this less. They wanted to see a benefit to themselves. [This highlights the problem that members of the general public can encounter in divorcing use values from non-use biodiversity value].
4. On biodiversity itself, the participants felt they were being asked to invest in their future - if this was not done then there would be problems in 20 to 30 years time.
5. There was a general consensus that the group wanted Ancient B/L

THE PARTICIPANTS WERE TOLD THAT NEW BROAD LEAF WAS NOT A ROUTE TO ANCIENT - IF THEY WANTED MORE ANCIENT THEN THAT IS WHERE THEY SHOULD INVEST THEIR COUNTERS IN ANCIENT

HOW MUCH MORE OR LESS VALUABLE DO YOU RATE EACH FOREST COMPARED TO FOREST 1 (UPLAND CONIFER) IN TERMS OF BIODIVERSITY

(See table)

The group agreed £0.35 was a reasonable figure for Upland conifer but allocated £0.30 for Lowland conifer, £0.63 for New Native BL (an average of a split vote between £0.50 & £0.75) and £1.50 for Ancient Semi-natural BL. There was a lengthy discussion as to how it would be collected (mentioned charging entry fees), but eventually they were persuaded to regard it as money they would pay direct in addition to any existing levy.

GENERAL COMMENT ON CROYDON GROUP

This was an articulate and opinionated group (BC1 socio-economic rating). Whilst there were some red-herrings, the discussions were interesting and relevant. It was difficult to keep the discussions on biodiversity, as several members of the group expressed very strong opinions about access and the commercial viability of forests.

FOCUS GROUP 2 - BRIDGEND, WALES - UPLAND FORESTS, 26/10/2001

DISCUSSION POINTS FROM GROUP 1, BRIDGEND

- **UPLAND CONIFER** - This forest contains birds, tree and wildlife - we don't mind them but we are not really into wildlife but we like to see them. On the negative side, mushrooms can be dangerous for children adults and wildlife.
- **UPLAND NEW BROADLEAVED** - basically, if you take forests 1,2 and 3 we get the same from all three. Basically, the same view and negatives. Bugs and stuff can destroy trees and wildlife - e.g. woodlice can destroy trees and stuff. We think it is the same with mushrooms - they can be dangerous. But we do like a bit of wildlife. We love the trees. Another participant claimed "it doesn't bother me but it would bother me if it wasn't there but I prefer to see wildlife not man made destruction of conifers and all that.
- **UPLAND NATIVE BROADLEAVED** (this is from the flip chart comments not discussion)- Good points were there were more sorts of trees and old wood. This forest also had interesting species. Again there were too many insects and the level of animal life was low compared to plants.
- The group expressed a preference for a "Robin Hood" type forest.

NEIL ASKED QUESTION - Does that mean you prefer the ancient forest?
ANSWER - yes, more animals than insects.
NEIL ASKED - "WOULD YOU PREFER TO HAVE FARMLAND TO TREES?"
The group said yes they would rather have farmland.

NEIL ASKED "OR DON'T YOU LIKE THE TREES AT ALL?"
ANSWER - I prefer the native, you can't walk through the conifers as they are too close. Prefer not to have man-made forests but the natural ones, where a bird dropping caused a seed which grew. I prefer these ones. But overall, the group preferred to have farmland to trees because they didn't like mushrooms. They preferred farmland to trees. In forests it's all fungi and stuff which can cause damage.

One participant (from the other group) pointed out that mushrooms break down things and pass on nutrients into the ground and feed the trees and if you take some of these elements away, other things will have to move on.

A female respondent replied to this saying "nevertheless, some of us hate insects and there are lots of bugs in the forest".

DISCUSSION POINTS FROM GROUP 2, BRIDGEND

- **UPLAND CONIFER FOREST** - Over 50% rare fungi which the group reckoned was a good thing. Liked red squirrels. This forest had the highest number of rare species living in it..
- **UPLAND NEW NATIVE BROADLEAVED** - Compared to others it didn't have so much animal life but it did have more plant and fungi. It was nice to see old trees that need maturing growing there. They are there for the future. It's better to see more traditional trees rather than pines which you can see everywhere. Only negative thing would be the number of insects.

- **UPLAND NATIVE BROADLEAVED** - Nice to see different types of trees which make it interesting to look at. Also good to see them all growing together rather than just conifers in rows with fire breaks in between. The only negative is there is a low level of animal life.

Both groups seemed very negative about insects and fungi. There was confusion over the merit of mushrooms - were they good or bad, edible or poisonous? One individual did point out that he had grown up with conifers and how the ground underneath them supported very little growth. Another group member pointed out that was not important because all that was required was a quick turnaround. The trees took nutrients from the ground so nothing short-term was able to grow.

VALUATION EXERCISE, BRIDGEND:

FOREST	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares
UPLAND CONIFER	33	20	£0.20 (but in proportion to £0.35)
NEW BROADLEAF	33.5	40	£0.40
ANCIENT BROADLEAF	33.5	40	£0.40

When asked about investing money, the group asked why money had to be spent on the forests anyway and asked why Nature couldn't be left to itself and just put money into Upland conifers.
Initially, this group wanted two thirds of the investment to go into Upland conifer forest which they felt would be better because it generated money and jobs. The issue of wood production had to be removed to make the group concentrate on preferred biodiversity.

The group seemed sensitive about protecting trees as a green belt site since they had witnessed a great deal of tree felling to make way for new houses. They expressed an interest in putting a special license in trees to protect them. The majority of the group (6 out of 8) felt that all the forests had an equal value and wanted an investment of 33% in each. They did suggest conifers should be grown in one part of the country to mass produce timber and support the native trees should be planted in the remaining countryside. This felt this would support more wildlife and insects whilst preserving economic viability.

INCREASING AREA BY 12000 HECTARES

The group were keen to know what they were going to get for their money. Would land be purchased from farmers? They felt if it came down to money, the UPLAND CONIFER would be best as you could plant trees closer together. Generally, there was reluctance to name a figure for an increase in area. The general feeling was the groups were not overly concerned about biodiversity.
The men in the group showed some persistence in returning the investment to Upland conifer because of generating money. There was discussion about investing for the future.

GENERAL COMMENT ON BRIDGEND GROUP

This was a C2DE group. The discussion was difficult to control in that the group were obviously sensitised to the subject of trees because of local issues - i.e. trees being cut down to build houses and motorways on what was regarded as green-belt land; as a result it was difficult to get them to focus on biodiversity. There was a perceptible suspicion about the motives and greed of farmers. The group felt that as the population grew this would get worse and even more green belt would be consumed.

The group contained one individual who watched the Discovery Channel (SKY TV) and preferred to show -off than tackle the valuation exercise. There was a great deal of suspicion over the valuation aspect of the evening and the group generally resented being forced to accept a figure of £0.35 for the Upland conifer forest. It was a struggle to get any valuation but eventually they surrendered the above figures. This was possibly the most vocal group.

The group wanted to know if the Government would be prepared to match their contribution. Why are we paying our taxes? Was a popular question. Neil asked if they felt they were already paying enough from their taxes. There was a feeling this was the case and that improvements should be funded from that. The group when advised this was additional got rather heated. There was general discontent and one participant demanded how you could be expected to reach a decision on how much you would pay when you don't know how much it would cost and didn't know how much the Forestry Commission were paying. "How does that £0.35 relate to what the Forestry Commission would pay?". The presenters agreed it was complicated but asked the group to try and focus on what they would be prepared to pay from their own pocket.

A certain degree of group fatigue set in. The "red herrings" distracted the group and when it came to allocating an actual monetary value they apparently seemed reluctant to break out of the counter system and merely repeated the same figures as the previous counter exercise. However, they did say this was proportionate to the valuation exercise - i.e. 20p equaled 35p, etc. At times, it seemed this group may actually prefer to have trees cut down and replaced by farmland - they gave out conflicting signals!

FOCUS GROUP 3 – NEWCASTLE - UPLAND FORESTS, 30/10/2001

DISCUSSION POINTS FROM GROUP 1, NEWCASTLE

Upland conifer
Advantages were the number of squirrels, mushrooms and butterflies. The small number of birds was also seen as an advantage as birds were thought of as scary. Disadvantages were less species and the production orientated approach. Indeed, the purpose of this forest was seen as producing wood and not necessarily for producing biodiversity.

Upland new native broadleaved woods
Advantages were that the forests looked more natural and less intrusive than upland conifers, with the trees being further apart and different shades of green. They were also seen as very typical of forests in Britain. This type of forest was seen to be generally more interesting that upland conifers and from a recreational point of view easier to walk around. It was also noted that the flowers were pretty. The disadvantages were a lack of animal species, but too many insects and too many birds.

Upland native broadleaved woods
An advantage was the number of animals. This woodland was also considered to remind them of images of Robin Hood, such that the trees were enchanting. It was also seen as more attractive in the winter and the birds were liked in this type of forest. A recreation disadvantage was that the participants felt they might get lost in such a forest. Another disadvantage was the feeling that the trees and mushrooms looked dehydrated and generally unhealthy compared to upland new native. The majority felt they would be a bit afraid of the wild cat.

DISCUSSION POINTS FROM GROUP 2, NEWCASTLE

This group initially presented statements of fact in terms of what they found in the information statement. Neil then asked if 'what were your gut feelings about these forest types'. The comments from this have also been included.

Upland conifer
Upland conifers were seen to have more rare species of fungi but less bird species, fewer species in comparison to the area covered and few open areas for vegetation to develop. Gut feels were that they liked the red squirrels and that it would look attractive in the winter with snow on the trees.

Upland new native broadleaved woods
The positives here were that the trees were mixed with open areas of vegetation to develop, more species of invertebrates, more species in comparison to the area of forest covered, generally a more natural environment and more rare species of bird. On the negative side it has less mammal species and as it has been in existence for only the last 50 years they thought that this might make it a bit vulnerable.

Upland native broadleaved woods

The positives were more plant varieties, more rare plant species, more species in comparison to the area covered, ground vegetation of flowers were better developed, more natural environment than the upland conifer and there were more invertebrates. On the negative side it was the most threatened and needed the most attention and management because of its age.

Generally broadleaved woodland was seen to provide more diversity and a nicer environment to walk in.

Comments and result within first stage of valuation

It was felt that a mixture of different types were needed to get the full range of species. One participant viewed the financial outlay as maintaining rather than increasing the current stock of forests. Another participant made the point that there was a need to pay money even for upland forest because there is a need to switch to a less production approach. Another participant stated that any forest was better than no forest. Another asked how ancient woodland can be increased and whether you could put the money into new native upland broadleaved woods and hope to get ancient eventually. The response was to suggest that a simplification had been used, but if they wanted more ancient they should choose that option.

No unanimous decision was made for the percentage preference question but the majority choose 10% for upland conifer, 40% for upland new native broadleaved woods and 40% upland native broadleaved within the preference question. For an increase of 12000 hectares a unanimous view was 0% for upland conifer, 40% for upland new native broadleaved woods and 60% upland native broadleaved.

VALUATION EXERCISE, NEWCASTLE

FOREST	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares
UPLAND CONIFER	10	0	*
UPLAND NEW NATIVE BROADLEAF	40	40	*
UPLAND NATIVE BROADLEAF	40	60	*

* No group consensus reached.

Comments on the second stage of valuation with money

One participant stated ‘if you asked me for a tenna at the end this today I would not give you it but if you took it out of my taxes.....’ . Another talked about recreational issues and it was explained that that was a separate issue. No majority was reached with the amounts varying from £0 to £5. It was decided to leave this to the individual questionnaires.

GROUP 4 - BIRMINGHAM - LOWLAND WOODLAND, 27/10/2001

DISCUSSION POINTS FROM GROUP 1, BIRMINGHAM

Upland conifer
Accessibility was seen as both a positive and negative. As it is less accessible then it is better for the environment, but not as good for young people and older people to walk in the forests. The species considered were more appealing that on the other cards. Conifers were seen to be generally better because they absorbed more pollution. One participant noted that he had only seen lowland forest before. Another stated a preference for the red squirrel.

Lowland conifers
Seen to be accessible as it was at a lower level. Nothing negative was mentioned.

Lowland new broadleaved native woodland
Seen as more natural but not generally seen as very appealing.

Lowland ancient semi-natural broadleaved wood
Traditional, idealistic view, and seen as more romantic than the other types. Nothing on the negative side.

General preference for lowland in terms of recreation.

DISCUSSION POINTS FROM GROUP 2, BIRMINGHAM

Upland conifer
The red squirrel was seen as positive but seen not to have the range of species you get with the other types of woodland. Poorer access was also noted.

Lowland conifers
More diverse range of animals. But concern was raised that is was commercialised. Thought also to be a lack of flowers.

Lowland new broadleaved native woodland
Thought to be found in a green belt. Seen as harder to establish but keep forested to stop the area being built up. More flowers and more diverse range of animals.

Lowland ancient semi-natural broadleaved woodland
Established in the community. Diverse range of animals. No negatives except a concern that as it is unmanaged if something goes wrong there is no help to put it right.

Comments and result within first stage of valuation
One noted that although there was some specialist species, the figures suggest that there is not much biodiversity in upland conifer forests. Lowland new broadleaved was seen as not important because of its small percentage of total forestry. Another

stated that preserving the red squirrel with upland conifers makes it important. Another saw lowland ancient as important and needing preservation as it embodies the spirit of 'what makes us English'.

There was a unanimous vote that all the money for lowland broadleaved should go to the ancient. One respondent said that lowland new broadleaf in a couple hundred of years will not be new any more but ancient. The standard response was made.

The result for general preferences towards the forest types was 20% in upland conifer, 20% in lowland conifer 20% in lowland new broadleaved and 40% in ancient. This was seen as a majority decision although no vote was made.

To the second question, it was stated that there may be thresholds for survival rates for new species. For this reason, it was suggested that the 1% increase in the upland forest would not make much difference. The point was also made that you can't really increase the lowland ancient broadleaved. Another participant suggested that lowland new broadleaved would have a more immediate benefit than the others, though it may take some time for it to have a role in the community. It was also seen as a means of stopping building on the outskirts of cities. New broadleaved was seen as more important that ancient because it is managed and one participant noted that, unlike the other forest types, it is not established in terms of the quantity of it found.

The decision was to put all the money in lowland new broadleaved. However, the conversation that led to this decision was dominated by only two participants and it was unclear how representative this was.

VALUATION EXERCISE, BIRMINGHAM

FOREST	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares
Upland Conifer in lowland group	20	0	£0.35
Lowland Conifer	20	0	£0.35
Lowland New Native	20	100	£0.50
Lowland Ancient	40	0	£0.50

Comments on the second stage of valuation with money

Focus was initially on the amount. A comparison was made with a bar of chocolate. A question was later asked how many households there are in Britain and was trying to work out how much this scheme would cost and divide by the number of households. This was not encouraged. A view was expressed that they would like to spend money on ancient woodland, but, given the time lag, the money would be better spent on protecting that area rather than starting the process for creating new ancient woodland.

The closest think to a consensus was £0.35 upland conifer, £0.35 for lowland conifer, £0.50 for lowland new broadleaved native woodland and £0.50 for lowland ancient semi-natural broadleaved woodland.

GROUP 5 - DALGETY BAY, FIFE, SCOTLAND - LOWLAND WOODLAND, 5/11/2001

DISCUSSION POINTS FROM GROUP 1, DALGETY BAY

- **UPLAND CONIFER FOREST** - Contains a large number of rare fungi. This is good for walking (easy access). However, there are fewer bird species and it really does scar the landscape when it is clear-felled.
- **LOWLAND CONIFER** - Good for recreation because they are managed. They have good paths with good access for cycling and walking. Again the appearance would be spoiled by clear-felling.
- **LOWLAND NEW BROADLEAVED NATIVE WOODLAND** - It is good it is not clear-felled - you will not spoil the landscape but it has poor access for recreation because of the weeds (hard to get to paths). There didn't seem to be a lot of mammals in this forest
- **LOWLAND ANCIENT SEMI-NATURAL BROADLEAVED WOOD** - We all liked this one because it looked good. Good for walking, good for birds, lots of species of birds. Good that it wasn't clear-felled. One bad point was because it is unmanaged there could be a safety risk - fallen trees across paths etc.

DISCUSSION POINTS FROM GROUP 2, DALGETY BAY

- **UPLAND CONIFER FOREST** - Good points - you make money from timber and it uses unfarmable land such as the steep sides of mountains. The bad points are there is too high a percentage of these trees and they are too uniform (obviously for ease of sorting when felled).
- **LOWLAND CONIFER FOREST** - More accessible than upland. It looks better as it has more paths and is more opened up. Again it is too uniform and there is a lack of variety. Felling generates money.
- **LOWLAND NEW BROADLEAVED NATIVE WOODLAND** - Looks a bit more natural with a larger variety of trees. Bad points - there is too little - only a small area throughout the whole country.
- **LOWLAND ANCIENT SEMI-NATURAL BROADLEAVED WOOD** - This has a large variety of trees and sustains distinctive fauna because it is ancient. It's part of our heritage and history. Bad points - it isn't able to be run as a money making concern. This could perhaps be managed better - i.e. keep the look of Ancient forests but get some money out of it - for example by felling trees that create danger.

VALUATION EXERCISE, DALGETY BAY:

FOREST	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares
UPLAND CONIFER	20	10	£0.35
LOWLAND CONIFER	20	10	£0.35
LOWLAND NEW NATIVE BROADLEAF	30	40	£1.40
LOWLAND ANCIENT SEMI-NATURAL BROADLEAF	30	40	£1.40

GENERAL POINTS ON DALGETY BAY GROUP

This was a very mixed group of B, C1, C2 and D. The group expressed the opinion that the forests didn't seem to differ that much in terms of biodiversity. [but since the values in the focus group were 4:1 for broadleaves v conifers, this suggests that aesthetics or cultural bias again dominated respondents' thinking]. Participants felt all forests should have some investment but they were interested in knowing where their money went. They also felt they would be more willing to pay if they had improved access to the forests.

There was a noticeably higher value placed on the newer Broadleaved forests compared to previous groups. There was very little disagreement about the benefits of forests and their associated biodiversity and this group seemed to value broadleaved forests highly..

GROUP 6 - WORSLEY, MANCHESTER - UPLAND FORESTS, 8/11/2001

DISCUSSION POINTS FROM GROUP 1, WORSLEY

- **UPLAND CONIFER FOREST** - Thought it was good that the Conifer forest supplied wood. Wildlife could cope with the clear-felling and move. On the bad side, they felt that this type of forest was not good for tourism (people like going for walks) it would keep changing if it got cut down. They were worried about risking the rare fungi.
- **UPLAND NEW NATIVE BROADLEAVED** -Very good in looking after itself. Accessible to everyone. Doesn't have a lot of damage to it so it's good for any rare species - they won't get affected. No bad points.
- **UPLAND NATIVE BROADLEAVED -** Has a lot of birds and mammals living in this forest. We don't know the reasons but it is under threat (perhaps from construction work. The group don't want to lose the rare plants. It is one of the most beautiful forests.

DISCUSSION POINTS FROM, GROUP 2, WORSLEY

- **UPLAND CONIFER** - Liked the red squirrels. It is important to look after these because they are getting less and less compared to the grey squirrels (the red seem able to breed on Upland areas). Had the bugs and plants in the correct ratio.. This also had goshawks - apparently a good thing. We thought the fungi were a bad thing - don't know if this is right but there seemed to be too much of it. Some may be used for domestic use? Thought fungi were quite boring - you don't go walking to look at fungi! [Again this is an example of use values coming to the fore in people's thinking on biodiversity].
- **UPLAND NEW NATIVE BROADLEAVED** - Good but more was needed. It seems to be easily maintained. Couldn't find any bad points.
- **UPLAND NATIVE BROADLEAVED** - Needs looked after - sheets say something is damaging it. Liked the idea of wildcats. This seemed to be the nicest place to go for walks (from the pictures).

OTHER COMMENTS - one lady said she didn't understand any of it (she did not have her glasses and couldn't read the cards very well). Another participant did not feel it was appropriate to be talking about biodiversity when countries were being bombed.

VALUATION EXERCISE, WORSLEY

FOREST	Present Situation (%)	Increase area by 12000 hectares ** (%)	Monetary Valuation for extra 12000 hectares
UPLAND CONIFER	30	20/30	£0.35
NEW NATIVE BROADLEAF	30	30/30	£0.40
UPLAND NATIVE BROADLEAF	40	50/40	£0.50

** The group were split 50/50
Three of the Four men wanted more Upland conifer forest because they liked red squirrels. The rest thought there was enough conifer trees and the other forests should get some attention.

GENERAL COMMENTS ON WORSLEY GROUP

This was a quiet group - no major arguments or distractions. The overall feeling was that the subject did not hold a great deal of interest of them. This was a D/E1 Socio-economic category.

GROUP 7 - LOCHGELLY, FIFE, 12/11/2001

DISCUSSION POINTS FROM GROUP 1, LOCHGELLY

UPLAND CONIFER FOREST - the group thought his was very picturesque and liked the trees. This type of forest seemed to encourage fungi for some reason - whether it is because of the soil they are planted in (peat?)? Didn't know the reasons why but felt fungi was a good thing. This type of forest creates employment because it is managed. The negative aspect of this is that it will never become an old forest and will never do the things the others can do. Again on the negative side, it is visually less attractive because of clear-felling. It doesn't encourage new plants or species perhaps because they get trampled.

UPLAND NEW NATIVE BROADLEAVED WOODLAND - again picturesque but it remains this way because it doesn't get felled. Plants grow well in this forest. The only negative is there are a lot of beasties (insects), but that keeps birds there too which is fine if you take a mosquito net along with you - it's not nice walking through insects (especially if you are female!). There appear to be open areas which may increase birds of prey - which may be why there's a reduction in mammals?(which would be negative). If left alone, this would be a lovely forest in about 150 years time.

UPLAND NATIVE BROADLEAVED WOOD - again picturesque, this forest encourages new growth and preserves plants that have been around for a long, long time. On the negative side, the group didn't like wildcats and polecats even though it was recognised that these should be preserved (but spokesperson didn't want to walk through them!). On the negative side, it costs a lot to preserve them.

As a group, they felt all three forests had merit - no particular favourite.

DISCUSSION POINTS FROM GROUP 2, LOCHGELLY

UPLAND CONIFER FOREST - this forest smells nice and kids love it. Because it is so dense, the group felt that because there are more trees you will get more oxygen. However, this density is also less attractive and these forests are too big and artificial looking.

UPLAND NEW NATIVE BROADLEAVED - these forests tend to be close to the public or at least nearer to civilization (therefore will be used more by people). It seems more balanced and more in harmony with nature than the upland conifer. No negatives.

UPLAND NATIVE BROADLEAVED - this forest has the highest diversity and is very natural. Probably the most under threat.

As a group, they preferred Native broadleaved wood.

OTHER COMMENTS - Group 1 was worried that if you developed forests near populated areas, then they would be used as a dumping ground. They were advised that some of these forests would be in remote areas. There was a desire to let new native become native. The group were advised that this would probably not happen. Half of the group felt that the conifer forests were already commercial and didn't need any more money. However, it was recognised that if they were on hills they were using difficult ground. In general, this group wanted more specialised information as to what the woodland species were and whether the rare species were to be found in one or more of the forests.

VALUATION EXERCISE, LOCHGELLY

FOREST	Present Situation (%)	Increase area by 12000 hectares (%)	Monetary Valuation for extra 12000 hectares *
UPLAND CONIFER	10	10	£0.35 / zero
NEW NATIVE BROADLEAF	30	40	£0.75 / zero
UPLAND NATIVE BROADLEAF	60	50	£1.50 / zero

- **half group said they would not be prepared to pay anything. The other figure is an average from the other half of the group.**

When asked to actually commit to a real sum of money (for an increase in the area of each forest) half the group said they would not pay anything as there were more worthwhile causes that needed funding. Interestingly the remaining individuals felt equally strongly that trees were a valuable resource and should be protected.

GENERAL COMMENTS ON LOCHGELLY GROUP

This was a BC1 mix and of particular interest because the previous two groups that had discussed Upland forests were C2DE. The presenters generally felt that previous discussions on Upland forests had been less fruitful than the Lowland presentations. They were unsure if this was because of the design of the upland show cards or the fact that the previous groups had been C2DE.

The Lochgelly group, despite being a higher socio-economic group, also felt "sluggish" and it proved difficult to stimulate much discussion. The group tried to cover this apathy by saying they really would have preferred more detailed information in order to make a truly valued judgement. However, with very little persuasion, they were prepared to overlook this and generalise about the topic. Despite the group's apparently higher educational background, it was interesting to again hear the general dislike of insects, wildcats and polecats (very similar to the Manchester (Worsley) and Bridgend groups).

TABLE A - INDIVIDUAL FEEDBACK ON LOWLAND CONIFER FORESTS

Person No.		PRESENT VALUE				VALUE OF EXTRA 12000 Hectares of Area (POINTS)				HOUSEHOLD CONTRIBUTION/YEAR (£'S)			
	SEG	UPC	LC	LBL	LABL	UPC	LC	LBL	LABL	UPC	LC	LBL	LABL
1 Croydon	BC1	20	20	20	40	20	20	30	30	0.35	0.30	0.75	1.25
2 Croydon	BC1	20	20	20	40	20	20	30	30	0.35	0.50	0.50	1.00
3 Croydon	BC1	30	20	20	30	30	30	10	40	0.3	0.20	0.40	1.10
4 Croydon	BC1	20	20	30	30	10	20	30	40	0.35	0.30	0.75	1.50
5 Croydon	BC1	10	20	30	40	-	-	-	-	0.35	0.30	0.75	1.20
6 Croydon	BC1	10	20	30	40	10	20	20	50	0.35	0.40	0.50	0.75
7 Croydon	BC1	20	20	30	30	10	30	30	30	0.35	0.50	0.75	0.75
8 Croydon	BC1	20	20	30	30	10	30	30	30	0.35	0.70	0.80	1.00
17 B'ham	BC1	20	40	10	30	10	40	10	40	0.35	0.35	0.20	0.50
18 B'ham	BC1	30	30	10	30	0	0	100	0	0.35	0.35	0.50	0.00
19 B'ham	BC1	20	15	35	30	20	10	50	20	0.35	0.20	0.50	0.50
20 B'ham	BC1	0	0	100	0	0	0	100	0	0.35	0.35	0.50	0.35
21 B'ham	BC1	0	20	30	50	0	0	80	20	0.35	0.35	0.50	0.50
22 B'ham	BC1	20	20	20	40	0	0	100	0	0.35	0.35	0.50	0.50
23 B'ham	BC1	10	30	40	20	0	0	100	0	0.35	0.50	0.50	0.50
24 B'ham	BC1	30	10	50	10	5	15	50	30	0.35	0.50	0.50	0.50
33 D Bay	BC1C2D	5	10	40	45	0	25	25	50	0.00	2.50	2.50	5.00
34 D Bay	BC1C2D	20	20	30	30	10	10	40	40	0.35	0.35	1.40	1.40
35 D Bay	BC1C2D	10	20	35	35	0	20	20	40	0.35	0.35	2.00	2.00
36 D Bay	BC1C2D	20	25	20	35	20	25	25	30	1.00	1.75	1.75	1.50
37 D Bay	BC1C2D	20	20	30	30	10	10	40	40	0.35	0.35	1.4	1.40
38 D Bay	BC1C2D	15	10	25	50	0	0	60	40	0.5	0.50	5.00	5.00
39 D Bay	BC1C2D	20	20	30	30	10	10	40	40	0.35	0.35	10.0	10.00
40 D Bay	BC1C2D	20	10	30	40	10	20	40	30	0.35	0.50	1.5	1.5
Mean		***17 %***	***19 %***	***31 %***	***33 %***	***7 %***	***14 %***	***51 %***	***28 %***	***0.37***	***0.53***	***1.44***	***1.65***

TABLE B - INDIVIDUAL FEEDBACK ON UPLAND CONIFER FORESTS

Person No.	SEG	PRESENT VALUE			EXTRA 12000 Hectares of Area			HOUSEHOLD CONTRIBUTION/YEAR (£'S)		
9 Bridgend	C2DE	20	40	40	20	40	40	0.20	0.40	0.40
10 Bridgend	C2DE	20	40	40	20	40	40	0.20	0.40	1.00
11 Bridgend	C2DE	20	40	40	20	40	40	0.20	0.40	0.40
12 Bridgend	C2DE	20	40	40	20	40	40	0.20	0.40	0.40
13 Bridgend	C2DE	20	40	40	20	40	40	0.00	0.	0.40

									40	
14 Bridgend	C2DE	20	40	40	20	40	40	0.35	0.40	0.45
15 Bridgend	C2DE	20	60	20	20	60	20	0.35	0.50	0.50
16 Bridgend	C2DE	20	40	40	20	40	40	0.35	0.60	0.40
25 N'castle		20	40	40	0	50	50	0.35	2.50	2.50
26 N'castle		10	55	35	0	60	40	0.35	1.50	1.50
27 N'castle		20	60	20	10	70	20	0.00	0.00	0.00
28 N'castle		20	40	30	10	40	40	0.00	1.00	1.00
29 N'castle		10	40	50	0	40	60	0.35	2.50	4.00
30 N'castle		5	40	55	0	45	55	0.35	3.00	3.00
31 N'castle		40	30	30	0	50	50	0.35	2.00	2.00
32 N'castle		15	25	60	0	30	70	0.00	0.00	0.00
41 Worsley	C2DE	20	30	50	10	40	50	0.35	0.40	0.50
42 Worsley	C2DE	30	30	40	25	30	45	0.35	0.40	0.50
43 Worsley	C2DE	30	40	30	35	40	30	0.35	0.45	0.40
44 Worsley	C2DE	40	20	40	40	30	30	0.35	0.50	0.40
45 Worsley	C2DE	40	40	20	0	0	0	0.35	0.35	0.20
46 Worsley	C2DE	20	20	60	10	20	70	0.35	0.40	0.50
47 Worsley	C2DE	20	30	50	10	40	50	0.35	0.40	0.50
48 Worsley	C2DE	10	40	50	10	40	50	0.35	0.40	0.50
49 L'gelly	BC1	10	30	60	10	40	50	0.35	0.50	1.00
50 L'gelly	BC1	20	30	50	10	50	40	0.00	0.00	0.00
51 L'gelly	BC1	10	30	60	10	40	50	0.35	0.50	1.00
52 L'gelly	BC1	10	50	40	10	50	40	0.35	2.00	1.00
53 L'gelly	BC1	10	30	60	10	40	50	0.00	0.00	0.00
54 L'gelly	BC1	10	30	60	10	40	50	0.00	0.00	0.00
55 L'gelly	BC1	10	30	60	10	40	50	0.35	1.00	2.00
56 L'gelly	BC1	10	30	60	10	40	50	0.35	1.00	2.00
Mean	**Mean**	***19 %***	***37 %***	***43.55 %***	***13 %***	***41 %***	***43 %***	***0.25***	***0.75***	***0.85***

Script for Upland Forest type

Good evening, I'd like to welcome you all to xxxx and thank you for sparing the time to come and join our focus group. A focus group is simply a group of people with varied backgrounds and histories, brought together to discuss current issues. Tonight, we are gathered together to discuss your feelings about upland forests and the animals, insects and plants that inhabits upland forests. At this point, I'd like to stress we do not expect any of you to be experts. We are interested in hearing your opinions on material that we will present to you. Everyone's views are valid and welcome. If there are any words or ideas which you are not acquainted with – and there may be because the cards we will show you were prepared by specialists – then please let me know. The meeting should last between an hour to an hour and a half.

We are interested in finding out what value you place on Britain's forests and woodlands. We are particularly keen to establish what you think of the plants and animals that live in forests. When we talk about forests we are referring to forests which you may not even use or see – perhaps because they are in remote, difficult to access areas or high on hills. We are not interested in the recreational use of these forests (that is things like forest walks and tours). Instead, we want you to think about the wildlife, insects and plants that thrive in these forests and to somehow "get a handle" on what their survival mean to you as an individual. We may refer to plants, insects, animals, plants and fungi (e.g. mushrooms) collectively as BIODIVERSITY GROUPS.

The evening will be divided into 4 parts:

- First we will describe 3 different Upland forest types. We will mention the typical trees they contain and what animal, insect and plant life exists in the forest. Remember we may sometimes refer to this as biodiversity. All information presented will be given to you as show cards so don't panic - there is no need to take notes or memorise the information I will present.

- We will split you into two groups and you will be asked to think of good and bad aspects for each forest type (paying particular attention to biodiversity). You will be asked to write these thoughts on post-it notes. You will be brought back together and one member of each sub group should report for the group as a whole. Remember one volunteer is worth 10 pressed men!
- The group as a whole will be given 100 counters and asked, considering the comments that have been made on the post it notes, to score the forest types according to their value for biodiversity. This decision should be made in consensus. You will later be asked to score the same forests but as an individual (a form will be supplied). You will also be asked to allocate a score to increase each forest type.
- Having established scores for the forest types, we will ask you to try and put a monetary value on increases in each forest.

PRESENTATION OF SHOW CARDS

FOREST 1: Upland Conifer Forest

Here is a photograph of a typical upland conifer forest. You tend to see them on upland plateau and valleys and hills. These forests are medium to large and account for 53% of all woodland in Britain. You may have seen a forest of this type from the road. These woods are managed in that wood is harvested using "clearfelling". Typical trees are Scots pine, Sitka spruce (a substantial element of many upland forests), and Norway spruce and Douglas fir. These are managed by a system of clearfelling. Clear-felling is the most economically efficient way of harvesting tress. In clear felling quite large areas of tress are felled at the same time, and the ground then replanted with saplings. Different wildlife species inhabit the forest in different stages of this rotation. For example, birds of prey, that feed on small mammals, require open space to hunt, which is possible when trees are relatively young. Birds of prey cannot hunt for mammals on the ground when trees are dense and tall. Trees felled in smaller blocks at different times permit wildlife species to move around the forest to a new suitable habitat.

The main purpose of this type of forest is to produce as much timber as possible, whilst meeting the minimum standards for nature conservation. The forest is made up of patches of young saplings, bushy young trees and dense thickets of taller trees about thirty feet high. We will be presenting show cards that break down the typical biodiversity that can be seen in each forest. This slide (show slide) shows examples of the typical animal, plant and insects found in an upland conifer forest, and how many different species you would expect to find there and how rare they are. Talk on OHP:

These are examples of types of animals, birds, insects and plants that live in an upland conifer forest. We want you to consider how important it is to you as an individual, to protect these species; and how important it is to you to see the numbers in these species increase in the area of this type of forest

relative to wildlife found in other types of forest. This type of forest does preserve some rare species - e.g. the red squirrels and goshawks.

FOREST 2: Upland Native Broadleaved Wood

Next I'd like to describe a much more mature and spacious type of woodland - Upland Native Broadleaved woods. These account for 12% of woodland in Britain. These are very ancient woodlands which have been around since at least 1600 and are usually quite small (5-100 hectares). These woodlands tend to be unmanaged or have small open patches. The typical tree species are oak, ash, hazel, birch, willows and rowan.

Nature conservation is a major element of this type of forest. The soil improving effect of many broadleaved trees increases fertility and overall amounts of wildlife in the soil and vegetation and therefore animals too, in comparison to the UPLAND CONIFER FOREST. The structure of the forest increases the richness of the forest for wildlife, especially for birds, mammals and plants. Native trees and shrubs also provide a habitat for many insects that are not found on spruce or other introduced conifers. Plants are more varied and more rare woodland species occur. There are more species of animals than in upland conifer forest. The only exceptions that may be less common are goshawk, crossbill, coal tit, siskin and perhaps red squirrel.

Typical examples of plants, insects and animals are shown in these pictures (show slide)

FOREST 3: Upland New Native Broadleaved woods

This accounts for only 1% of woodland in Britain and is usually quite small scale. These are quite "young" forests - say around 50 years of age. Again, like the previous woodland, these are largely unmanaged (i.e. not planted for timber production). Native species are oak, birch, Rowan and Scots pine. The ground vegetation is less well developed than in older broadleaved native woodlands. But still generally provides more wildlife diversity than an Upland Conifer forest. The following slide gives an idea of the biodiversity supported within this woodland setting.(show slide)

INSTRUCTIONS FOR GROUPS:

1. Divide yourselves into equal halves. Try and avoid remaining in a group if you know other team members well.

2. Elect a spokesperson.

3. Individually read the show cards provided by the chairperson.

4. As a group discuss these cards and agree what are the good and bad aspects of each forest as regards the ability to support biodiversity. Record the groups opinion by placing colored post-its onto the sheets provided.

Type	good	bad
Upland Conifer		
Upland New Native Broadleaved Woods		
Upland Native Broadleaved Woods		

5. Once you have completed this task let the chairperson know and reform into one large group. The elected spokesperson for each group should describe the group opinion's to the large group.

RECONVENE GROUP

6. (1) In the large group, decide how many counters (you will receive 100), should be allocated to each forest type according to their value for biodiversity. Base your response on the points raised on the post-it notes. (2) How much greater do you think the value would be for an increase of 12000 hectares in FOREST 2 and then FOREST 3?
7. "A previous study of the general public in the UK asked people whether they would be willing to pay for the costs of increasing the area of upland conifer forests (forest number 1) by 1%, or 12,000 hectares, Remember that a hectare is roughly equal to a football pitch. Taking into account those folk who were not willing to pay anything at all for this increase, the average "value" the study came up with was **35p per household per year**. Think about this as the "value" people in the study put on having an extra 12,000 hectares of upland conifer forest, together with the biodiversity that you find in these forests (which you have been talking about). It's quite a small number because a lot of people did not put any value on increasing this kind of forest.

We would now like to ask you **how much more (or less!) valuable** a similar increase in the other two/three forests we have been thinking about would be to you in terms of the biodiversity they contain, compared to this £0.35 for upland conifers. Remember we are only thinking about the value of forests for biodiversity, and not for timber production or anything else. Can you complete the following table as a group? You will get the chance to do this individually at the end."

For the upland groups:

Forest	*Increase in area*	*What's it worth for the biodiversity t provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Upland new native woods	Planting 12,000 hectares, which is just less than a 50% increase	??
Upland native broadleaved	Planting 12,000 hectares, which is a 4.5% increase	??

8. Please fill in form 2 as completely as possible. We are especially interested in your individual opinions and additional feedback. When completed please hand to the chairperson. You will receive payment as thanks for your time and effort.

FORM TWO - RESPONDENT DETAILS

FULL NAME:

ADDRESS (including postcode):

SIGNATURE: **DATE:**

INDIVIDUAL RESPONSES TO BIODIVERSITY ISSUES

1. ***Assuming the 100 counter system how much value, in terms of biodiversity, would you place on each forest? (If nothing, state 0). These values should add up to 100!:***

Present Biodiversity value	Upland Conifer Forest	Upland New Native Broadleaved woods	Upland Native Broadleaved Woods
Number of counters			

2. Assuming the 100 counter system, how much greater do you think the value should be for an extra 12,000 hectares of each forest type (If the answer is nothing state 0):

Increasing Present Area of each Type	Upland Conifer Forest	Upland New Native Broadleaved woods	Upland Native Broadleaved Woods
Number of counters			

3. ***In terms of personal contributions, the most I would be prepared to pay for increasing the area of these forests would be:***

Forest	*Increase in area*	*What's it worth for the biodiversity t provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Upland new native woods	Planting 12,000 hectares, which is just less than a 50% increase	??
Upland native broadleaved	Planting 12,000 hectares, which is a 4.5% increase	??

***** If less than £0.35 please say so *****

END OF QUESTIONS. THANK YOU FOR YOUR TIME AND CONTRIBUTIONS. PLEASE HAND THIS SHEET, ONCE COMPLETED, TO THE CHAIRPERSON.

Script for Lowland Forest type

Good evening, I'd like to welcome you all to xxxx and thank you for sparing the time to come and join our focus group. A focus group is simply a group of people with varied backgrounds and histories, brought together to discuss current issues. Tonight, we are gathered together to discuss your feelings about lowland forests and the animals, insects and plants that inhabit lowland forests. At this point, I'd like to stress we do not expect any of you to be experts. We are interested in hearing your opinions on material we will present to you. Everyone's views are valid and welcome. If there are any words or ideas which you are not acquainted with – and there may be because the cards we will show you were prepared by specialists– then please let me know. The meeting should last between an hour to an hour and a half.

We are interested in finding out what value you place on Britain's forests and woodlands. We are particularly keen to establish what you think of the plants and animals that live in forests. When we talk about forests we are referring to forests which you may not even use or see – perhaps because they are in remote, difficult to access areas or high on hills. We are not interested in the recreational use of these forests (that is things like forest walks and tours). Instead, we want you to think about the wildlife, insects and plants that thrive in these forests and to somehow "get a handle" on what their survival mean to you as an individual. We may refer to plants, insects, animals, plants and fungi (e.g. mushrooms) collectively as BIODIVERSITY GROUPS.

The evening will be divided into 4 parts:

First we will describe 3 different Lowland forest types and one upland conifer forest. We will mention the typical trees they contain and what animal, insect and plant life exists in the forest. Remember we may sometimes refer to this as biodiversity. All information presented will be given to you as show cards so don't panic - there is no need to take notes or memorise the information I will present.

- Next, we will split you into two groups and ask you to think of positive and negative aspects for each forest type (paying particular attention to biodiversity). You will be asked to write these thoughts on post-it notes (color coded for positive/negative) and stick them on to of flip chart paper pre-prepared for each forest type. For instance one forest type may support more insects and less animals - you may see this as being negative in comparison to a forest that supports more animals. You will be brought back together and one member of each sub group should report for the group as a whole. Remember one volunteer is worth 10 pressed men!
- The group as a whole will be given 100 counters and asked, considering the points that have been made on the post it notes, to score the forest types according to their value for biodiversity. This decision should be made in consensus. You will later be asked to score the same forests but as an individual (a form will be supplied). You will also be asked to allocate a score to increases in a forest type.
- Having established scores for the forest types, we will ask you to try and put a monetary value on increases in each forest.

PRESENTATION OF SHOW CARDS

FOREST 1: Upland Conifer Forest

Here is a photograph of a typical upland conifer forest. You tend to see them on upland plateau and valleys and hills. These forests are medium to large and account for 53% of all woodland in Britain. You may have seen a forest of this type from the road. These woods are managed in that wood is harvested using “clearfelling”. Typical trees are Scots pine, Sitka spruce (a substantial element of many upland conifer forests) and Norway spruce and Douglas fir.

The main purpose of this type of forest is to produce as much timber as possible, whilst meeting the minimum standards for nature conservation. The forest is made up of patches of young saplings, bushy young trees and dense thickets of taller trees about thirty feet high.

We will be presented with show cards that break down the typical biodiversity that can be seen in each forest. This slide (show slide) shows examples of the typical animal, plant and insects found in an upland conifer forest, and how many different species you would expect to find there and how rare they are. Talk on OHP.

These are examples of types of animals, birds, insects and plants that live in an upland conifer forest. We want you to consider how important it is to you as an individual, to protect these species and how important it is to you to see the numbers in these species increase through an increase in area of this type of forest relative to wildlife found in other types of forest. This type of forest does preserve some rare species - e.g. the red squirrels and goshawks.

FOREST 2: Lowland conifer forest

This type of forest accounts for 16% of all woodland in Britain (medium to large in size) and includes Scots and Corsican pine and Norway spruce. There may be a mix of conifer and broadleaf trees. You may have seen these types of forests planted on arable or pasture land. They can be quite dense and dark with only a few gaps (as fire breaks). Lowland conifer forests are primarily planted for timber purposes and are harvested by a system called “clear-felling". Clear-felling is the most economically efficient way of harvesting tress. In clear felling quite large areas of tress are felled at the same time, and the ground then replanted with saplings. Different wildlife species inhabit the forest in different stages of this rotation. For example, birds of prey, that feed on small mammals, require open space to hunt, which is possible when trees are relatively young. Birds of prey cannot hunt for mammals on the ground when trees are dense and tall. Trees felled in smaller blocks at different times permit wildlife species to move around the forest to a new suitable habitat. Show slide.

FOREST 3: Lowland New Broadleaved Native Woodland

This type of forest is unusual in Britain - only 0.2% of all woodland in Britain. The woods tend to be on the small side. The forests are largely unmanaged and there is a small amount of tree felling and they tend to be established on ex-arable land. The types of trees found here is oak and birch . The undergrowth is very weedy. Typical wildlife and plants (or flora and fauna are shown in these pictures.

FOREST 4: Lowland Ancient Semi-natural Broadleaved Wood

(Show OHP) This accounts for 18% of woodland in Britain. These tend to be small woodlands which are largely left wild. Typical trees are oak, beech, yew and ash trees. Some are of tall high forest and wood pasture with old veteran trees. These old woods contain many distinctive species of plants, animals and birds and have a lot of deadwood.

INSTRUCTIONS FOR FOCUS GROUP DISCUSSION:

1. Divide yourselves into equal halves. Try and avoid remaining in a group if you know other team members well.

2. Elect a spokesperson.

3. Individually read the show cards provided by the chairperson.

4. As a group discuss these cards and agree the positive and negative aspects of each forest. Record your opinion by placing colored post-its onto the flip chart provided.

Type	**good**	**bad**
Upland Conifer		
Lowland Conifer		
Lowland New Broadleaved Native Woods		
Lowland Ancient Semi-natural Woods		

5. Once you have completed this task let the chairperson know and reform into one large group. The elected spokesperson for each group should describe the group opinions.

RECONVENE GROUP

6 (1) In the large group, decide how many counters (you will receive 100), should be allocated to each forest type according to their value for biodiversity. Base your response on the points raised on the post-it notes.

6 (2) How many counters would you allocate to each forest type, i.e. How much greater do you think the value would be to increase each forest type by 12,000 hectares? Get agreement on how many counters you would allocate to increasing each forest type.

7. "A previous study of the general public in the UK asked people whether they would be willing to pay for the costs of increasing the area of upland conifer forests (forest number 1) by 1%, or 12,000 hectares, Remember that a hectare is roughly equal to a football pitch. Taking into account those folk who were not willing to pay anything at all for this increase, the average "value" the study came up with was **35p per household per year**. Think about this as the "value" people in the study put on having an extra 12,000 hectares of upland conifer forest, together with the biodiversity that you find in these forests (which you have been talking about). It's quite a small number because a lot of people did not put any value on increasing this kind of forest.

We would now like to ask you **how much more (or less!) valuable** a similar increase in the other two/three forests we have been thinking about would be to you in terms of the biodiversity they contain, compared to this £0.35 for upland conifers. Remember we are only thinking about the value of forests for biodiversity, and not for timber production or anything else. Can you complete the following table as a group? You will get the chance to do this individually at the end."

For the lowland groups:

Forest	*Increase in area*	*What's it worth for the biodiversity this provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Lowland conifers	Planting 12,000 hectares, which is about a 3% rise	??
Lowland new native woods	Planting 12,000 hectares, which means more than doubling the existing area	??
Lowland ancient semi-natural	Protecting/re-generating 12,000 extra hectares, which is also about a 3% rise	??

FORM TWO - INDIVIDUAL RESPONDENT DETAILS

FULL NAME:

ADDRESS (including postcode):

SIGNATURE: **DATE:**

INDIVIDUAL RESPONSES TO BIODIVERSITY ISSUES

1. Assuming the 100 counter system how much value, in terms of biodiversity, would you place on each forest? (If the answer is nothing state 0).These values should add to 100:

Present Biodiversity value	Upland Conifer Forest	Lowland Conifer	Lowland New Broadleaved Woods	Lowland Ancient Semi-natural Woods
Number of counters				

2. Assuming the 100 counter system, how much greater do you think the value should be to increase the area of each forest type by 12, 000 hectares? (If the answer is nothing state 0):

Increasing Present Area of each Type	Upland Conifer Forest	Lowland Conifer	Lowland New Broadleaved Woods	Lowland Ancient Semi-natural Woods
Number of counters				

3. In terms of personal contributions, the most I would be prepared to pay the following for increasing the area of these forests is:

Forest	*Increase in area*	*What's it worth for the biodiversity this provides?*
Upland Conifers	Planting 12,000 hectares, which is about a 1% rise	£0.35/hsld/yr
Lowland conifers	Planting 12,000 hectares, which is about a 3% rise	??
Lowland new native woods	Planting 12,000 hectares, which means more than doubling the existing area	??
Lowland ancient semi-natural	Protecting/re-generating 12,000 extra hectares, which is also about a 3% rise	??

***** If less than £0.35 please say so *****

END OF QUESTIONS. THANK YOU FOR YOUR TIME AND CONTRIBUTIONS.

Appendix C

Expert group focus group

Centre for Environmental History and Policy
University of Stirling
21st November 2001.

Participants
The focus group was attended by:

Kate Holl – Scottish Natural Heritage
Roy Watling – Mycological Consultant
Clifton Bain – RSPB
Alistair Somerville – SWT
Lindsay Mackinlay – National Trust for Scotland
Alister Jones – Forestry Commission

REPORT OF MEETING
Introduction
This study forms part of a large research project on the value of woodlands in the UK, commissioned by the Forestry Commission. The study is looking at the economic values of non timber benefits. As well as biodiversity the study takes in recreation, landscape effects, carbon sequestration, water resources, and archaeology.

This part of the study has concentrated mainly on the values the general public hold for the intrinsic value of biodiversity. Focus groups have been run with a symbolically representative sample of members of the general public. The expert focus group was asked to go through a similar set of exercises as the general public and the materials provided were designed for their use, so some generalisation and simplification was required.

Many thanks to the group for giving up their time and for their useful and constructive comments.

Materials
The group was split in two, and materials for the lowland forest types were given to one half and upland forest types to the other half. Having read through the materials the group felt that several criticisms should be made. Firstly they felt that the categorisation did not represent the full range of forest types in the UK – particularly the regional variations in ancient forest types, and were curious as to why existing categorisations such as those used for biodiversity action plans had not been adopted. Secondly, that there were many inaccuracies in the information provided. However, the group did feel that for the general public, to provide information on the number of species of different types, and the number of rare species was appropriate, but characteristic species could be been left out, especially as this information

was thought to be misleading. They also thought that to give some indication of trends in rarity for these species would be useful, and information on the quality of the biodiversity.

Group participants were invited to give more detailed criticism in individual reports.

Positive and Negative aspects of the Forest Types
Having discussed the materials the group were asked to think about the positive and negative aspects (for biodiversity) of each forest type. They were asked to write what they considered to be the three most important of these thoughts on post it notes (colour coded for positive/negative) and stick them on to of flip chart paper pre-prepared for each forest type. The upland and lowland groups presented their thoughts to each other, and added any other points that they considered to be important. These are shown below.

Upland Forest Types.

Upland Conifer	
Positives	Negatives
1) Some old Conifer Woods have species typical of ancient woods. 2) Take pressure of recreation away from higher bird value native woods. 3) N.B. Upland Native Scots Pine is a conifer wood 4) Good rare species numbers 5) Species of birds and raptors-good mammal food chain 6) Exotic trees encourage a wider a different variety of fungi 7) Scale - internally + connectivity 8) Flexible management options.	1) Low in number of species of conservation priority i.e. rare, threatened or declining species. 2) Occupy open ground habitat of higher potential bird value. E.g. Bog or Heath. 3) Aggressive exotic tree species out compete native trees of conservation importance i.e. Sitka v. Scots Pine. 4) Poor plant and invertebrate numbers ∴ poor fungal diversity. 5) Large size- better to have a mosaic of habitats. 6) Clear fell brings about deterioration of soil ecosystems. Esp. micro-organisms 7) Predominantly non native tree species. 8) Management systems can be insensitive 9) Possibly have displaced (or fragmented) other valuable (high biod.) habitat 10) Increased acidification of water – negative effects for wildlife.

Upland New Native Woods	
Positive	Negative
1) Helps expand rare habitat of native woodland. 2) Potential value in long term to biodiversity. 3) Biodiversity potential greater than current value. 4) Predominantly native tree species. 5) Good coverage of vegetation types 6) Mosaic of habitats 7) Less disturbance	1) Not as good as existing wood for species of conservation priority 2) Species component reduces over time. 3) Poor plant and fungal activity 4) Mediocre coverage of all organisms 5) Poor biodiversity of fungi. 6) Immaturity of woodland 7) Small size and scale overall 8) Biodiversity potential limited unless close to existing woodland. 9) Essentially small woods – lack woodland interior.

Upland Native Broadleaves	
Positive	Negative
Value as pure habitat in itself 1) Higher number of species of conservation importance 2) Large number of plants and invertebrates leads to a higher fungal biodiversity. 3) Age 4) Incidence of Pole Cat and Wild Cat 5) Continuity on the site 6) Predominantly native tree species. 7) Characteristic species of otherwise declining habitat.	**Poor coverage of rare species** 1) Too small 2) Relatively small areas individually (fragmented and not connected) 3) Unmanaged probably means neglected.

Lowland Forest Types.

Lowland Ancient Semi-Natural	
Positive	Negative
1) Continuity of woodland cover on a site. 2) Presence of woodland specialist species. 3) High Number of woodland species 4) High number of rare woodland species 5) Highest percentage of deadwood habitat. 6) Often support rare species and diverse ecological communities, 7) Support species with historical continuity	1) Often small in size, fragmented and isolated from other woods. 2) Subject to impacts/influences of adjacent land uses. 3) Small size. 4) Fragmented 5) Future uncertain because of non management. 6) Often too small to support viable populations of species (rare) 7) Small size makes them vulnerable to edge effects and development 8) Potential to expand is limited.

Lowland New Native Woodlands	
Positive	Negative
1) Potential to create linkages with existing woodland networks. 2) Good for transitional ecological communities. 3) Opportunity to enhance biodiversity – create new edge/habitat. 4) Often wildlife refuges in otherwise intensive landscapes. 5) Native species of trees. 6) Potentially placed next to ancient wood. 7) Varied temporary habitats. (+species) compared to farmland.	1) Many species widespread and not specialist (with notable exceptions). 2) Often evolve as tree-lands rather than woodlands unless beside existing old woodland. 3) Often too small to support viable populations of many species. 4) Lack of woodland specialists. 5) Small total area. 6) Low number of woodland species. 7) Small size.

Lowland Conifers	
Positive	*Negative*
1) Large size 2) Non woodland habitats present 3) Less disturbance to wildlife via edge effects. 4) Often large enough to support viable populations of many species 5) Can be large and hence valuable in providing woodland interior.	1) Low number of tree species 2) Replacing more important conservation habitats? 3) Lack many species of older (mixed) woodlands. 4) Planted on recent, non woodland sites. 5) Lack of woodland/structural diversity. 6) Native tree species offer greater value for specialist species (usually). 7) Poor ground flora (generally) 8) May be valuable for range of species but subject to periodic sometimes large scale disruption. 9) Lack of species characteristic of mature/overmature senescent end of things.

The group wished several caveats to be taken into account:

1) habitat networks and the structure and mix of woodlands (both internally and on a landscape level) are the most important factors, and were not adequately represented in these exercises.
2) the quality of biodiversity is a key factor that was not illustrated in the materials
3) measurements of biodiversity represent a snapshot in time, particularly for newer woodlands, and that the potential biodiversity value of woodlands as well as their present value should be represented.
4) ancient-pinewood, in the Scottish context is a very important forest type that was not represented in the categories given as it could fit in the Upland Conifer category – but would perhaps sit more comfortably, given the description in the materials, in the Upland Broadleaved category.

Relative Valuation

Given the time that had gone in to the discussion of the materials the group were asked to complete an exercise on the relative value of these woodland types for biodiversity, and on the value of increasing these forest types (rather than completing the willingness to pay exercise).

The group was brought back together to complete the relative valuation exercise, first with the lowland forest types, together with the Upland Conifer type as a control. The group were asked to divide 100 counters between these four forest types according to how they currently valued them for biodiversity. Having scored these forest types for the current situation the group were asked to consider a situation where the area of these forest types could be increased by **1000 hectares**, and again asked to score according to how much they would value this increase for biodiversity. In the case of ancient woodlands the group were asked to consider the value of protecting an additional 1000 hectares. Having completed this exercise for the lowland forest types, the exercise was repeated for the upland forest types. The results of this exercise are shown below.

Lowland Forest Types

	Existing Situation		Expand by 1000 hectares	
	Participantsa & c-f	Participant b*	Participantsa & c-f	Participant b*
Upland Conifer (control)	4		0	
Lowland Conifer	12	30	0	20
Lowland New Broadleaved	17	10	50	30
Lowland Ancient Broadleaved	67	60	50	50

*These values were added after the focus group

Upland Forest Types

	Existing Situation		Expand by 1000 hectares			
	Participants a & c-f	Participant b	Participant a	Participants b & c	Participants d & e	Participant f
Upland Conifer	8		0	0	0	0
Upland New Broadleaved	30		70	40	30	50
Upland Native Broadleaves	62		30	60	70	50

The group were concerned about being asked to consider both protection and expansion in the same question, as they felt that these were different issues. The issue of expansion also posed problems, as again the group felt that the location of these expansions would have a great bearing on their value for biodiversity.

For the Upland Forest types the group were unable to come to a consensus on values for the expansion question, and so values specified by individuals are given. The reason for this lack of consensus centred on issue of whether enough effort had been made to expand new Upland Broadleaved Woodlands in the recent past, and whether attention should now return to preserving existing Upland Broadleaved Woodlands.