



# Species and Habitat Action Plan Assessment Form

*Please refer to the accompanying guidance for information about how to complete this form and an explanation of terms used*

## Field 1: Action Plan details

<b>Species/Habitat Action Plan</b>	<b>Ley's Whitebeam (<i>Sorbus leyana</i>)</b>
<b>Lead Partner/Agency</b>	<b>National Botanic Garden of Wales</b>
<b>Steering Group/Other organisations</b>	<b><i>Steering group in existence? Please state yes or no. Please list the organisations represented. Yes. NBGW, CCW, BSBI, UWales Swansea, RBG Kew, Forest Enterprise/Forestry Commission, Brecknock Wildlife Trust.</i></b>
<b>Work programme in existence?</b>	<b><i>Please state yes or no. If in existence, please use the agreed work programme to update Field 3 and Table B. Yes - but flexible, informally agreed and subject to revision as circumstances require.</i></b>

## Field 2: Objectives and targets overview

*Please list the targets for the action plan, indicating in which country/region the target is applicable, and additional comments including the rationale for new targets. For each new target please add new sequential paragraph numbers and target text. Please provide information about progress and country disaggregation in Table A for all targets.*

Number and text	UK	E	NI	S	W	Comments
4.1. Maintain and, where possible, enhance populations of Ley's whitebeam at its extant sites					x	In progress. See Section 5.
4.2 By 2003, identify two sites which would be suitable for the introduction of cultivated material should the wild population be lost					x	In progress. Ongoing discussion and evaluation of possibilities with CCW and other bodies; field survey soon.

## Field 3: Proposed actions overview

*Please list the proposed actions for the action plan, indicating in which country/region the action is applicable. For each new action please add new*

**sequential paragraph numbers and action text. If the action is regarded as significant (please see guidance) indicate this in the box and provide further details in Table B. For actions not regarded as significant simply state if the action is ongoing or complete. Remember any action which is being dropped from the workplan will be regarded as significant for the first round of reporting.**

Number and text	UK	E	NI	S	W	Action significant?	Action complete or ongoing? (Please state yes, not started, or ongoing.)
5.1.1 Consider the inclusion of this taxon on Schedule 8 of the Wildlife and Countryside Act 1981, at the earliest possible opportunity					x	x	Ongoing
5.2.1. Following the research outlined in 5.5.3, assess the need for site management at extant sites in order to create favourable conditions for growth and recruitment. If a management programme is considered necessary, it should be implemented by 2003.					x	x	Ongoing
5.2.2. Seek opportunities for the creation of suitable habitats for Ley's whitebeam within currently afforested areas.					x	x	Ongoing
5.3.1. Coordinate existing programmes for the <i>ex-situ</i> conservation of Ley's whitebeam and seek to involve Wakehurst Place and the new National Botanic Garden of Wales. The material cultivated for any future introduction schemes should be genetically representative, as identified by the research outlined under 5.5.4. Priority should also be given to the maintenance of <i>ex-situ</i> populations of budded material and, if possible, seed from all existing wild individuals.	x				x	x	Ongoing
5.3.2. Undertake a survey to identify suitable sites away from (but close to) native localities where cultivated seedlings of Ley's whitebeam could be introduced in the event of wild populations being lost (although sites with <i>S. minima</i> or <i>S. anglica</i> should be avoided). This work should also serve to identify potential sites for natural recruitment.					x	x	Ongoing
5.4.1. Advise landowners and managers of sites supporting native populations (and sites proposed for introduction), of the importance of this taxon and					x	x	Ongoing

<b>any activities which may be damaging to it.</b>							
<b>5.5.1 Survey the two known sites for this species and map all surviving trees and any seedlings found. The sites should then be monitored frequently for at least 10 years and the need to protect individual seedlings reviewed at each visit.</b>					<b>x</b>	<b>x</b>	<b>Ongoing</b>
<b>5.5.2. Make a demographic assessment of each population, and use the findings to inform site and species management.</b>					<b>x</b>	<b>x</b>	<b>Ongoing</b>
<b>5.5.3 Assess potential factors which may be limiting the population size, including the effects of disease, herbivores and the spread of non-native trees, with a view to developing a beneficial management programme for both sites.</b>					<b>x</b>	<b>x</b>	<b>Ongoing</b>
<b>5.5.4 Consider a genetic screening programme to add to existing data on intra- and inter-population genetic variation</b>					<b>x</b>	<b>x</b>	<b>Ongoing</b>
<b>5.6.1 Promote the development of existing visitor interpretation about endemic whitebeams at the Garw Nant Centre and seek to establish a similar educational resource at the new Welsh National Botanic Garden.</b>					<b>x</b>	<b>x</b>	<b>Partly started</b>
<b>5.7.1 (Links with other action plans). This plan should be considered in conjunction with those for upland mixed ash woodland and lowland calcareous grassland.</b>	<b>x</b>	<b>x</b>			<b>x</b>	<b>x</b>	<b>Ongoing</b>

**Field 4: Assessment of status**

**Please tick the appropriate category to indicate the assessment of status of the species or habitat, for each country/region where appropriate, and provide a statement supporting the category selected.**

	Not appropriate	Recovered	Signs of recovery	No change	Declining	Lost	Insufficient information
<i>UK</i>							
<b>England</b>							
<b>Northern Ireland</b>							
<b>Scotland</b>							
<b>Wales</b>				x (Popn)	x (Habitat)		

**Brief text description justifying assessment of status: (~ no more than 100 words for each country/region)**

Surveys carried out during the period from 1971 onwards indicate that the number of mature wild trees of Ley's Whitebeam has probably remained constant (1998 surveys suggest that the correct total number is 11, growing on limestone cliffs at two localities about 1 km apart) but that their habitat conditions are worsening, with declining fruit production and decreasing potential for recruitment.

**Field 5: Summary statement**

**Please provide an overview of plan implementation, including new factors affecting the species or habitat which will accelerate or constrain progress towards meeting of the targets. Where a factor results in new action(s) please cross-reference back to the relevant numbers under Field 3 and Table B.**

Several of the actions and objectives included in the plan for Ley's Whitebeam have already, at least in part, been incorporated in previous or ongoing projects carried out by CCW (monitoring surveys), Dr Q.O.N. Kay of the University of Wales, Swansea and NBGW (surveys, biological and genetic studies and ex-situ cultivation), the Forestry Commission (ex-situ cultivation, a reintroduction and habitat protection) the Brecknock Naturalists' Trust (habitat protection) and others. As a result, some of the initial objectives of the plan, in particular the initial population survey, had already been largely achieved, and previous work has provided a firm basis for implementation of many other parts of the plan, as has been described in other parts of this report. Because of the small number and ecological distinctness of the two present sites and of potential new localities, preliminary surveys and assessments are relatively easy, but detailed surveys requiring close examination of individual trees, and especially monitoring of establishment and recruitment, are difficult in the cliff habitat of Ley's Whitebeam. Difficulties are also anticipated in the ex-situ production of seedlings from seeds gathered from wild individuals, although previous experience has shown that this can be done and the work is already in hand (see Section 5.3.1).

**Field 6: Signing off**

**Please 'sign off' the form below to confirm that steering group members or key**

**contacts have been consulted and agreed the information provided.**

<b>Contact details</b>	<b>Lead Partner</b>	<b>Contact Point</b>
<b>Name</b>	<b>Dr Q.O.N. Kay</b>	<b>Andy Jones (for Ray Woods)</b>
<b>Organisation</b>	<b>National Botanic Garden of Wales</b>	<b>Countryside Council for Wales</b>
<b>Assessment date (dd/mm/yy)</b>	<b>27/09/99</b>	<b>28/09/99</b>

**Completed forms should be submitted to JNCC**

**Biodiversity Information Service  
Joint Nature Conservation Committee  
Monkstone House  
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Peterborough PE1 1JY  
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**Table A: Action Plan objectives and targets (Copiable table)**

**For each target please state how, if applicable, it has been disaggregated to the country level. Please insert the paragraph number, UK target and country-specific disaggregated target(s) into the table. Please tick the appropriate category to indicate progress against published and disaggregated targets. For each target please copy the table and detail the (existing or new [new paragraph numbers should run sequentially, under relevant headings in the published volumes]) paragraph number, target text and an assessment of progress.**

Objective/target <i>(For new or revised targets please provide the new paragraph number and target text.)</i>			4.1. Maintain and, where possible, enhance populations of Ley's whitebeam at its extant sites		
Country	Not appropriate	Target achieved	Some progress	No progress	Insufficient information
<i>UK (where appropriate)</i>					
<i>England</i>					
<i>Northern Ireland</i>					
<i>Scotland</i>					
<i>Wales (all targets)</i>			x		
<p><b>Text description of target progress (separate for each country/region):</b> Wales: Both extant populations and all potential sites for new populations envisaged in the Plan are in Wales. Work on the plan by NBGW and CCW began in 1998. The initial surveys of the two extant sites are complete (5.5.1), published information has been reviewed, and unpublished information on file from previous surveys made by CCW and others has been collated. A search for additional unpublished information, especially in correspondence and as annotations on herbarium specimens, is planned for 1999/2000. Monitoring, including searches for seedlings, is ongoing (5.5.1). Some demographic assessments have been made (5.5.2) and more detailed assessments of the size, age and reproductive performance of each tree are planned. CCW have advised the owner of the Daren-fach site of the importance of Ley's Whitebeam and reached agreement on potential management actions by CCW at the site, including, if necessary, the felling or lopping of overshadowing or invasive trees that may be adversely affecting the whitebeams (5.4.1, 5.5.3). Existing biological and genetic studies of Ley's Whitebeam were summarised and discussed at a meeting at Ledbury in November 1998. Further biological studies, especially of the effects of herbivores and disease (5.5.3), and more detailed genetic screening studies of inter- and intrapopulation variation (5.5.4), perhaps using the RAPD techniques that were used by Elin Lemche in her recent Cambridge Ph.D. study of <i>Sorbus</i> microspecies, are planned. These would probably be carried out collaboratively, perhaps with small research contracts being involved, rather than as a single Ph.D project. A survey of Ley's Whitebeam trees at present in cultivation is in progress (nearly all the few trees in <i>ex situ</i> cultivation, with the exception of a single 22-year old tree from Daren-fach seed at Swansea, apparently originate from the Penmoelallt population, possibly from a single original grafted cutting). A start has been made on a programme to establish representative <i>ex situ</i> populations with the collection and sowing under appropriate conditions, September 1999 of small numbers of seeds from three Daren-fach trees (5.3.1).</p>					

<b>Objective/target</b> <i>(For new or revised targets please provide the new paragraph number and target text.)</i>			4.2 By 2003, identify two sites which would be suitable for the introduction of cultivated material should the wild population be lost		
<b>Country</b>	<b>Not appropriate</b>	<b>Target achieved</b>	<b>Some progress</b>	<b>No progress</b>	<b>Insufficient information</b>
<i>UK (where appropriate)</i>					
<i>England</i>					
<i>Northern Ireland</i>					
<i>Scotland</i>					
<i>Wales (all targets)</i>			x		
Desk studies to identify sites where new populations might be established have commenced, and fieldwork to evaluate potential sites is planned for 1999/2000.					

**Table B: Proposed actions (Copiable table)**

For each significant action please copy and complete the table below.

Published action/organisation(s) responsible <i>(For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.1.1 Consider the inclusion of this taxon on Schedule 8 of the Wildlife and Countryside Act 1981, at the earliest possible opportunity</b>	
Work plan/organisation(s) responsible <i>(Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	CCW, NBGW	
Action/workplan undertaken? <i>(Please state yes or no.)</i>	In progress	
Description of work taken and organisation responsible.	Ley's Whitebeam is <b>not yet on Schedule 8. Preliminary discussions among Steering Group members suggest that inclusion may not be necessary or beneficial at this stage</b>	
<b>Output and timescale</b>	Not appropriate	<i>Action by</i>
Constraints to action <i>(Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	Not appropriate	
Action complete or ongoing? <i>(Please state yes, not started, or ongoing.)</i>	Ongoing	
Next steps	To be kept under review.	
<b>Output and timescale</b>	Ongoing	<b>Action by</b>

Published action/organisation(s) responsible <i>(For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.2.1. Following the research outlined in 5.5.3, assess the need for site management at extant sites in order to create favourable conditions for growth and recruitment. If a management programme is considered necessary, it should be implemented by 2003.</b>	
Work plan/organisation(s) responsible <i>(Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	CCW, FE	
Action/workplan undertaken?	The actions that are taken are dependent upon prior research and	

<i>(Please state yes or no.)</i>	assessment, so a 'yes or no' answer is inappropriate.	
<i>Description of work taken and organisation responsible.</i>	To be determined (and see above and below). CCW, FE	
<b>Output and timescale</b>	<b>Ongoing surveys have shown that some management work (lopping or removal of increasingly tall ash trees below some sections of the cliffs where a number of <i>S. leyana</i> trees grow at the Daren-fach site) is urgently necessary; a management agreement has recently been obtained by CCW and the work should be carried out soon. Similar, cautious, management work is also likely at the Penmoelallt site, with FE approval. Other and further actions are dependent on further prior research and assessment, including monitoring of the effects of earlier management actions.</b>	<i>Action by</i> CCW, FE
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	See above. The actions that are taken are dependent upon prior research and assessment	
<i>Action complete or ongoing? (Please state yes, not started, or ongoing.)</i>	Ongoing	
<i>Next steps</i>	The future actions that are taken are dependent upon prior research and assessment	
<b>Output and timescale</b>	To be determined	<b>Action by</b> CCW,FE

<i>Published action/organisation(s) responsible (For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.2.2. Seek opportunities for the creation of suitable habitats for Ley's whitebeam within currently afforested areas</b>	
<i>Work plan/organisation(s) responsible (Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	NBGW, CCW, FE	
<i>Action/workplan undertaken? (Please state yes or no.)</i>	In progress	
<i>Description of work taken and organisation responsible.</i>	<b>The seeking of opportunities for the creation of suitable habitats for Ley's whitebeam within currently afforested areas... NBGW and CCW, (rationale and surveys) FE (possible implementation as owner and manager)</b>	
<b>Output and timescale</b>	See next box	<i>Action by</i> CCW,

		<i>NBGW, FE</i>
<b>Constraints to action</b> <i>(Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	<b>Under consideration in conjunction with 4.2; dependent on presence of potentially suitable limestone cliffs (few of which are likely to exist), ownership and management considerations, and other limiting factors.</b>	
<b>Action complete or ongoing?</b> <i>(Please state yes, not started, or ongoing.)</i>	Ongoing	
<b>Next steps</b>	As for 4.2; completion of desk study, with field surveys in 1999/2000	
<b>Output and timescale</b>	As above	<b>Action by NBGW, CCW</b>

<b>Published action/organisation(s) responsible</b> <i>(For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.3.1. Coordinate existing programmes for the <i>ex-situ</i> conservation of Ley's whitebeam and seek to involve Wakehurst Place and the new National Botanic Garden of Wales. The material cultivated for any future introduction schemes should be genetically representative, as identified by the research outlined under 5.5.4. Priority should also be given to the maintenance of <i>ex-situ</i> populations of budded material and, if possible, seed from all existing wild individuals.</b>	
<b>Work plan/organisation(s) responsible</b> <i>(Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	<ol style="list-style-type: none"> <li>1. Involve NBGW and Wakehurst Place/RBGKew (NBGW)</li> <li>2. Trace and catalogue existing <i>ex-situ</i> trees (NBGW)</li> <li>3. Ensure that material cultivated for <i>ex-situ</i> conservation and potential future introductions is genetically representative (NBGW, WP)</li> <li>4. Establish genetically representative <i>ex-situ</i> populations from budded material and also, if possible, seed from all existing wild individuals (NBGW, CCW)</li> </ol>	
<b>Action/workplan undertaken?</b> <i>(Please state yes or no.)</i>	Yes	
<b>Description of work taken and organisation responsible.</b>	<b>In progress. See later sections. NBGW is now centrally involved in these actions as the Lead Partner (and Q.O.N. Kay of NBGW is preparing this report...). Existing <i>ex-situ</i> trees are being traced and catalogued, with assessments of their status and parentage. Steps are being taken to obtain seed-raised progeny from as many extant wild trees as possible. Arrangements for the establishment of <i>ex-situ</i> populations of budded material representing all the less than 20 wild trees, preferably maintained in duplicate at separate centres, are under consideration, if possible commencing in 1999/2000.</b>	
<b>Output and timescale</b>	Action point 1 complete Action point 2 in progress Action point 3 ensured by collection from all wild trees Action point 4 in progress	<b>Action by NBGW, CCW, WP</b>

<p><b>Constraints to action</b> (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</p>	<p><b>Production of seed-raised progeny from wild individuals is constrained by their low seed fertility, the need to restrict seed collection to no more than 20% of the individual's crop so that natural regeneration could still take place, the low and short viability of the seeds that are produced, and their scanty, if any fruit production in most years under present conditions. 1999-crop seeds (5, 9 and 13 seeds respectively) have already been set to germinate (by QK for NBGW), using proved techniques that succeeded with <i>S. leyana</i> in 1976; the fruits were collected from 3 of the c. 7 established trees at Daren Fach by CCW.</b></p>	
<p><b>Action complete or ongoing?</b> (Please state yes, not started, or ongoing.)</p>	<p>Ongoing</p>	
<p><b>Next steps</b></p>	<p>Action point 4 is of particular importance and has the highest priority. Ley's Whitebeam is a small but potentially very long-lived tree; there are very few extant wild trees and it should not be difficult to maintain <i>ex-situ</i>, completely genetically representative populations permanently, in duplicate at two separate centres. To obtain these populations, and also young trees suitable for possible introductions to new wild sites, progeny must be obtained successfully by grafting or, especially for the possible introductions, from seed; this is dependent on the uncertain success of the propagation programme (see above) which will continue until hopefully full coverage is achieved. The effectiveness of long-term seed storage is uncertain but this will also be attempted.</p>	
<p><b>Output and timescale</b></p>	<p>Continuing</p>	<p><b>Action by NBGW, CCW</b></p>

<p><b>Published action/organisation(s) responsible</b> (For new or revised actions please provide the new paragraph number and action text.)</p>	<p><b>5.3.2. Undertake a survey to identify suitable sites away from (but close to) native localities where cultivated seedlings of Ley's whitebeam could be introduced in the event of wild populations being lost (although sites with <i>S. minima</i> or <i>S. anglica</i> should be avoided). This work should also serve to identify potential sites for natural recruitment.</b></p>	
<p><b>Work plan/organisation(s) responsible</b> (Summary of work plan agreed by the steering group, broken down by year if possible.)</p>	<p>1. Desk study to establish distribution of possibly suitable limestone and base-rich cliffs and exposures (NBGW, CCW) 2. Field survey to confirm their existence, assess their actual or potential ecological suitability (CCW, NBGW) and identify ownership and management constraints (CCW)</p>	
<p><b>Action/workplan undertaken?</b> (Please state yes or no.)</p>	<p>Yes</p>	
<p><b>Description of work taken and organisation responsible.</b></p>	<p><b>Under discussion. A preliminary field survey should be in progress in the next few months. Ecologically suitable limestone or base-rich cliffs are likely to be few in number and easily identifiable, but their ownership and management are crucial.</b> NBGW, CCW.</p>	
<p><b>Output and timescale</b></p>	<p>Action point 1 started Action point 2 not started</p>	<p><b>Action by NBGW,</b></p>

		CCW
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	<b>Ecologically suitable limestone or base-rich cliffs are likely to be few in number. Their ownership and management are crucial.</b> Some otherwise suitable sites may exist in quarries or roadside cuttings, but these are particularly likely to be subject to disturbance and to potential competition from introduced and invasive species.	
<i>Action complete or ongoing? (Please state yes, not started, or ongoing.)</i>	Ongoing	
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>	
<b>Output and timescale</b>	Action point 1: completion in winter 1999/2000. Action point 2: winter 1999/2000 onwards.	<b>Action by</b> NBGW, CCW

<i>Published action/organisation(s) responsible (For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.4.1. Advise landowners and managers of sites supporting native populations (and sites proposed for introduction), of the importance of this taxon and any activities which may be damaging to it</b>	
<i>Work plan/organisation(s) responsible (Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	<ol style="list-style-type: none"> <li>1. Establish ownership of the Daren-fach site (a cliff forming the boundary between areas in different ownership), advise the owner and manager of the importance of the taxon, and if possible obtain a management agreement. (CCW)</li> <li>2. Confirm existing understanding and management arrangements for the Penmoelallt site with the Forestry Commission and Forest Enterprise. (CCW, FE)</li> <li>3. Establish ownership of potential introduction sites, advise owners of the importance of the taxon and the suitability of the site for a potential introduction, and if possible obtain a secure potential management agreement.</li> </ol>	
<i>Action/workplan undertaken? (Please state yes or no.)</i>	Yes	
<i>Description of work taken and organisation responsible.</i>	<i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i>	
<b>Output and timescale</b>	Action point 1 complete Action point 2 under way Action point 3 not started	<b>Action by</b> CCW, FE
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	No insuperable local difficulties or conflicts have been encountered so far.	
<i>Action complete or ongoing?</i>	Ongoing	

<i>(Please state yes, not started, or ongoing.)</i>	
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>
<b>Output and timescale</b>	Action point 2 1999-2000 Action point 3 2000 onwards <b>Action by</b> CCW,FE

<i>Published action/organisation(s) responsible</i> <i>(For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.5.1 Survey the two known sites for this species and map all surviving trees and any seedlings found. The sites should then be monitored frequently for at least 10 years and the need to protect individual seedlings reviewed at each visit.</b>
<i>Work plan/organisation(s) responsible</i> <i>(Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	<b>1. Survey the two known sites for this species and map all surviving trees and any seedlings found (CCW, NBGW). 2. Monitor the sites for at least 10 years, reviewing the need to protect individual seedlings at each visit (CCW, NBGW)</b>
<i>Action/workplan undertaken?</i> <i>(Please state yes or no.)</i>	Yes
<i>Description of work taken and organisation responsible.</i>	<i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i>
<b>Output and timescale</b>	Action point 1 complete Action point 2 ongoing <b>Action by</b> CCW, NBGW
<i>Constraints to action</i> <i>(Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	The cliff habitats of the two extant populations are difficult to reach, arduous to traverse and partly inaccessible on foot; surveys are time-consuming and exhausting.
<i>Action complete or ongoing?</i> <i>(Please state yes, not started, or ongoing.)</i>	Ongoing
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>
<b>Output and timescale</b>	Action point 2, 1999-2009 and possibly beyond. <b>Action by</b> CCW, NBGW

<i>Published action/organisation(s) responsible</i> <i>(For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.5.2. Make a demographic assessment of each population, and use the findings to inform site and species management.</b>
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<p><i>Work plan/organisation(s) responsible</i> (Summary of work plan agreed by the steering group, broken down by year if possible.)</p>	<ol style="list-style-type: none"> <li>1. Collate all existing information about the history and size of each population from published and unpublished material, previous survey data held on file, etc. (NBGW, CCW, BWT)</li> <li>2. Identify and locate all established trees and seedlings in the wild populations, measure the distances between them, and note the number, girth and height of their trunks or main branches, with sketches and preferably photographs of each tree. (CCW, NBGW)</li> <li>3. Estimate the age of each individual as precisely as possible; for established trees, it may be possible to obtain information on age and growth-rate by measurements and counts of annual rings in the stumps of dead former trunks or basal branches. (CCW, NBGW)</li> </ol>	
<p><i>Action/workplan undertaken?</i> (Please state yes or no.)</p>	Yes	
<p><i>Description of work taken and organisation responsible.</i></p>	<p><i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i></p>	
<p><b>Output and timescale</b></p>	<p>Action point 1 about 75% complete Action point 2; initial survey complete; ongoing survey for seedlings Action point 3 not started but partly prepared for during 2</p>	<p><b>Action by</b> NBGW, CCW</p>
<p><i>Constraints to action</i> (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</p>	<p>The cliff habitats of the two extant populations are difficult to reach, arduous to traverse and partly inaccessible on foot; surveys are time-consuming and exhausting, and some trees are largely or entirely impossible to reach without specialised equipment, the use of which may not be acceptable in any case. The surveys themselves, and any attempt to measure the age of individual trees, must be involve minimal disturbance and not cause any harm to the very small numbers of extant trees (coring, for example, is not acceptable).</p>	
<p><i>Action complete or ongoing?</i> (Please state yes, not started, or ongoing.)</p>	Ongoing	
<p><i>Next steps</i></p>	<p><i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i></p>	
<p><b>Output and timescale</b></p>	<p>Action point 1: completion hoped for during 1999-2000. Action point 2: initial completion anticipated during 1999-2000, with annual updates subsequently Action point 3: completion hoped for during 1999-2000.</p>	<p><b>Action by</b> CCW, NBGW</p>

<p><i>Published action/organisation(s) responsible</i> (For new or revised actions please provide the new paragraph number and action text.)</p>	<p><b>5.5.3 Assess potential factors which may be limiting the population size, including the effects of disease, herbivores and the spread of non-native trees, with a view to developing a beneficial management programme for both sites.</b></p>	
<p><i>Work plan/organisation(s) responsible</i> (Summary of work plan agreed by the steering group, broken down by year if possible.)</p>	<ol style="list-style-type: none"> <li>1. Obtain historical data on observations of disease and herbivory in the Ley's Whitebeam population from published and unpublished sources and from examination of herbarium specimens (NBGW)</li> <li>2. Collate data on disease and herbivory in related <i>Sorbus</i> species from published sources (NBGW, FE).</li> </ol>	

	<p>3. Make observations on the occurrence and effects of disease and herbivory at the extant Ley's Whitebeam sites, identifying the causative organisms where possible (NBGW, CCW)</p> <p>4. Make field surveys and assessments of the actual or potential occurrence and effects of invasive or introduced non-native species at the extant Ley's Whitebeam sites (NBGW, CCW).</p> <p>5. Make field surveys and assessments of the actual or potential occurrence and effects of invasive or introduced non-native species at proposed introduction sites (NBGW,CCW, FE).</p> <p>6. Assess other observable or potential limiting factors (NBGW, CCW, FE)</p> <p>7. Draft and prioritise an ongoing, flexible management plan for each site on the basis of these observations (NBGW, CCW, FE).</p>		
<p><i>Action/workplan undertaken? (Please state yes or no.)</i></p>	<p>Yes</p>		
<p><i>Description of work taken and organisation responsible.</i></p>	<p><b><i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i></b></p>		
<p><b>Output and timescale</b></p>	<table border="1"> <tr> <td> <p>Action point 1: perhaps 50% complete, amount of further information that can be obtained uncertain. (1999-2000)</p> <p>Action point 2: not started (1999-2001)</p> <p>Action point 3: started, less than 10% complete (1999 onwards)</p> <p>Action point 4: about 50% complete (1999 onwards)</p> <p>Action point 5: not started (1999 or 2000 onwards)</p> <p>Action point 6: started, less than 10% complete (1999 onwards)</p> <p>Action point 7: started, less than 10% progress towards likely final version. (1999 onwards)</p> </td> <td> <p><b>Action by</b> NBGW, CCW, FE</p> </td> </tr> </table>	<p>Action point 1: perhaps 50% complete, amount of further information that can be obtained uncertain. (1999-2000)</p> <p>Action point 2: not started (1999-2001)</p> <p>Action point 3: started, less than 10% complete (1999 onwards)</p> <p>Action point 4: about 50% complete (1999 onwards)</p> <p>Action point 5: not started (1999 or 2000 onwards)</p> <p>Action point 6: started, less than 10% complete (1999 onwards)</p> <p>Action point 7: started, less than 10% progress towards likely final version. (1999 onwards)</p>	<p><b>Action by</b> NBGW, CCW, FE</p>
<p>Action point 1: perhaps 50% complete, amount of further information that can be obtained uncertain. (1999-2000)</p> <p>Action point 2: not started (1999-2001)</p> <p>Action point 3: started, less than 10% complete (1999 onwards)</p> <p>Action point 4: about 50% complete (1999 onwards)</p> <p>Action point 5: not started (1999 or 2000 onwards)</p> <p>Action point 6: started, less than 10% complete (1999 onwards)</p> <p>Action point 7: started, less than 10% progress towards likely final version. (1999 onwards)</p>	<p><b>Action by</b> NBGW, CCW, FE</p>		
<p><b>Constraints to action</b> <i>(Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i></p>	<p>Difficulties of identifying some disease organisms and herbivores, fairly certainly resolvable by tapping the expertise and experience of colleagues and specialist authorities; uncertainty about the occurrence and/or importance of these and other real or apparent limiting factors, and the ways in which these might be overcome or minimised; constraints imposed by lack of time, resources and personnel..</p>		
<p><b>Action complete or ongoing?</b> <i>(Please state yes, not started, or ongoing.)</i></p>	<p>Ongoing</p>		
<p><b>Next steps</b></p>	<p><b><i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i></b></p>		
<p><b>Output and timescale</b></p>	<table border="1"> <tr> <td> <p>See above for action points 1-7; 'onwards' action points in this list are likely to continue throughout the project</p> </td> <td> <p><b>Action by</b> NBGW, CCW, FE</p> </td> </tr> </table>	<p>See above for action points 1-7; 'onwards' action points in this list are likely to continue throughout the project</p>	<p><b>Action by</b> NBGW, CCW, FE</p>
<p>See above for action points 1-7; 'onwards' action points in this list are likely to continue throughout the project</p>	<p><b>Action by</b> NBGW, CCW, FE</p>		
<p><b>Published action/organisation(s) responsible</b> <i>(For new or revised actions please</i></p>	<p><b>5.5.4 Consider a genetic screening programme to add to existing data on intra- and inter-population genetic variation</b></p>		

<i>provide the new paragraph number and action text.)</i>		
<i>Work plan/organisation(s) responsible (Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	<b>Under discussion for implementation, perhaps in a joint small-scale study at Cambridge or at the University of Wales, Swansea (CCW, NBGW). DNA techniques similar to those used in the recent study of <i>Sorbus</i> microspecies, including a single accession of <i>S. leyana</i>, by Elin Lemche may be suitable for population studies and would be particularly appropriate for the identification of seedlings, etc. of uncertain identity . Preliminary morphological assessments of variation within the Daren-fach population, using large samples of fallen leaves from each tree, have already been made (by QK) and have indicated the limits of variation and shown that leaf-shape is highly variable among different leaves from a single individual; it was uncertain whether differences between individuals were purely phenotypic, reflecting differences in vigour or degree of shading, or had a genetic component.</b>	
<i>Action/workplan undertaken? (Please state yes or no.)</i>	Under discussion but not yet implemented.	
<i>Description of work taken and organisation responsible.</i>	<i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i>	
<b>Output and timescale</b>	<p><i>(Possible implementation)</i></p> <ol style="list-style-type: none"> <li>1. Collection of samples for DNA studies; CCW/NBGW, early summer 2000</li> <li>2. DNA studies at Cambridge BG, RBG Kew or UWales Swansea; summer or autumn 2000 (c. 3 or 4 weeks work, ancillary to other projects with similar technical requirements?)</li> </ol>	<b>Action by</b> CCW, NBGW
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	Availability of groups/workers with suitable expertise, techniques and apparatus, probes etc., time and willingness to undertake this small but significant molecular project	
<i>Action complete or ongoing? (Please state yes, not started, or ongoing.)</i>	Not started	
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>	
<b>Output and timescale</b>	See above	<b>Action by</b>
<i>Published action/organisation(s) responsible (For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.6.1 Promote the development of existing visitor interpretation about endemic whitebeams at the Garw Nant Centre and seek to establish a similar educational resource at the new Welsh National Botanic Garden.</b>	

<i>Work plan/organisation(s) responsible (Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	<b>1. Promote the development of existing visitor interpretation about endemic whitebeams at the Garw Nant Centre (FE, CCW). 2. Seek to establish a similar educational resource at the new Welsh National Botanic Garden (NBGW).</b>	
<i>Action/workplan undertaken? (Please state yes or no.)</i>	Yes (but little progress to date)	
<i>Description of work taken and organisation responsible.</i>	<i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being undertaken</i>	
<b>Output and timescale</b>	Action point 1. Not started Action point 2: <b>At NBGW, some coverage of Ley's Whitebeam already appears in NBGW posters describing proposed scientific and educational programmes, and much more will be incorporated when these programmes are fully implemented.</b>	<i>Action by</i> CCW, NBGW
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>		
<i>Action complete or ongoing? (Please state yes, not started, or ongoing.)</i>	Ongoing	
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>	
<b>Output and timescale</b>	Implementation of Action Point 1 (2000 onwards) and further development of Action Point 2 (1999 onwards)	<b>Action by</b> CCW, NBGW, FE

<i>Published action/organisation(s) responsible (For new or revised actions please provide the new paragraph number and action text.)</i>	<b>5.7.1 (Links with other action plans). This plan should be considered in conjunction with those for upland mixed ash woodland and lowland calcareous grassland.</b>	
<i>Work plan/organisation(s) responsible (Summary of work plan agreed by the steering group, broken down by year if possible.)</i>	Under consideration	
<i>Action/workplan undertaken? (Please state yes or no.)</i>	No further action immediately necessary	
<i>Description of work taken and organisation responsible.</i>	<i>Please provide details of progress to date, including information about outputs, deadlines, which organisations and where action is being</i>	

	<i>undertaken</i>	
<b>Output and timescale</b>	Under consideration	<b>Action by</b> CCW
<i>Constraints to action (Please provide an explanation of the significant issues or difficulties encountered and how they have been or will be resolved. Any constraints which the steering group are unable to resolve should also be detailed.)</i>	These HAPs are of debatable relevance to the calcareous cliff habitat of Ley's Whitebeam	
<i>Action complete or ongoing? (Please state yes, not started, or ongoing.)</i>	Ongoing consideration	
<i>Next steps</i>	<i>Please outline future action/work including an indication of expected output, timescale and organisation responsible.</i>	
<b>Output and timescale</b>	Uncertain	<b>Action by</b>