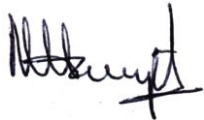






Mechanisms for filling knowledge gaps for Biodiversity Action Plan Species

January 2009

Client	Joint Nature Conservation Committee			
Project Title	Developing a mechanism for filling knowledge gaps in UK Biodiversity Action Plan Species.			
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The appendix is an associated Excel Workbook with six spreadsheets titled:

- Suite 1
- Suite 2
- Actions not considered
- Suite 1 with additional information
- Combining actions
- Action groupings

1.0 INTRODUCTION

1.1 Background information

The UK Biodiversity Reporting and Information Group (BRIG) co-ordinates and supports the UK Biodiversity Action Plan (BAP) process. The UK Biodiversity Research Advisory Group (BRAG) promotes and facilitates biodiversity research within the UK and links to research initiatives internationally. In 2007 BRIG reviewed and updated the UK BAP species and habitats thereby highlighting the priorities for conservation action.

As part of the review, a UK list of priority species and habitats was published, together with 'signposts' for each of the 1150 UK BAP species. A large database has been developed that includes over 3500 signposts. It was intended that each of these signposts should give rise to one or more actions, and it is these actions that are the subject of the workshop described in this report ([UK BAP signposting data](#)).

It is important that, where identified, these actions are implemented soon. All the actions will be dealt with by separate UK BAP processes. The current report deals with only those actions that were categorised as research or one-off survey. A contract to do this work was filled by Peak Ecology Limited and managed by a Steering Group comprising Ant Maddock and Paul Rose (JNCC), in conjunction with Margaret Palmer (Wildlife and Countryside Link), and Deborah Long (Scottish Environment Link). This Steering Group represents the BRIG/BRAG research sub-group.

This report summarises a project to identify the UK BAP research and one-off survey actions that can be implemented immediately and those for which further work is required before the actions can be implemented.

1.2 The Project

To fulfil the aims of the project, Peak Ecology were contracted to organise, host and facilitate a workshop to assess and identify research and one-off survey actions for single species and groups of species from the overall signposting database, which can be taken forward without delay. In addition, a process for further developing outstanding research requirements was required.

An original spreadsheet of 2048 actions was sent to Peak Ecology, which was a sub-section of the overall signposting database (UK BAP signposting data). The actions to be assessed within this project had been categorised in the database as:

- species specific monitoring/survey

- non-species specific monitoring/survey
- species specific research
- non-species specific research

These categories had been assigned to the database by the JNCC.

Peak Ecology, initially, would assess and organise the information provided in readiness for presentation at the workshop. All aspects of the workshop would also need to be organised (venue, catering etc.) and the relevant experts would need to be identified and invited.

Key Aim 1 – identify ‘Suite 1’ actions

The first key aim of the workshop was to identify the research and one-off survey actions that could go forward immediately, and to assess their urgency. These are identified within the report as ‘Suite 1’ actions. A subsidiary aim was to identify individual actions within Suite 1 that could be grouped into larger survey or research projects.

Key Aim 2 – identify ‘Suite 2’ actions

The second aim was to identify actions that do not fall under Suite 1. These would be actions that could not be dealt with at the workshop (relevant expert was not present), or were not clear and needed referral back to the originator. These are identified as ‘Suite 2’ actions.

Both suites, rationalised from the signposting database and identified in this report, are equally important, and should be further developed, beyond the workshop, to ensure the conservation of the priority species.

2.0 METHODOLOGY

The main aim of the workshop was to identify those actions that were one-off survey and research, which could be taken forward straight away, and importantly those which would have an impact in terms of filling knowledge gaps for Biodiversity Action Plan species. The workshop outputs would enable biodiversity delivery partners to take forward research and one-off survey actions as efficiently as possible; this process was designed as a sorting mechanism to identify actions and/or groups of actions for immediate implementation.

2.1 Pre-workshop database rationalisation

The first requirement was to rationalise the database for use at the workshop. The rationalisation process began by separating the actions into the different taxa (birds,

mammals, fungi, lichens, marine species, vascular and non-vascular plants, fish, herptiles and invertebrates). The invertebrate actions were then split further, into the different taxonomic groups (Hymenoptera, Lepidoptera, Coleoptera etc.).

Following this initial rationalisation and on assessing the database, it was clear that some actions were long-term or ongoing monitoring/surveillance projects or management actions, which would fall outside the remit of the workshop. These actions were identified by Peak Ecology and were marked TBC ('To Be Confirmed') as such by the experts at the workshop. All on-going surveillance/ monitoring and management actions so identified are listed in the Appendix (as the spreadsheet titled 'Actions not considered').

All other actions were given the number 1, to indicate that they were to be discussed fully by the experts in terms of answering workshop questions (see below).

The aim of this rationalisation was to ensure the data were manageable, and to identify those actions that were the specific focus of the workshop i.e. research and one-off survey.

2.2 Workshop participants

The workshop was held on December 4th and 5th in Peterborough, and was generously hosted by Natural England.

An important part of ensuring the success of the workshop would be to invite the relevant experts for the different species groups. The people given information regarding the workshop were academics working in biodiversity, taxonomic experts (both amateur and professional) and staff of relevant research organisations, statutory agencies and Non-Governmental Organisations (NGOs).

Information was sent to 150 experts. A mix of experts from the different species groups was required, and the number of experts invited for each group (invertebrates, vascular plants, non-vascular plants, mammals, birds, fish, reptiles and amphibia, marine species, lichens and fungi) was dependent on the number of actions to be assessed and the degree of specialism of the experts. For example, invertebrates had the most actions to be considered and the experts generally dealt with narrow taxonomic groups, so this is reflected in the fact that a relatively large number of invertebrate specialists were invited.

Table 1 shows the experts who attended the workshop. Of the 150 invitees, 30 were present.

Table 1. List of participants to attend the Biodiversity Action Plan species workshop to rationalise actions from the signposting database.

Surname	First Name	Organisation
Ainsworth	Martyn	British Mycological Society
Baker	Helen	JNCC
Bidartondo	Martin	Imperial College
Bielby	Jon	Zoological Society of London
Brereton	Tom	Butterfly Conservation
Brooks	David	Rothampstead
Broome	Alice	Forestry Commission Wales
Cheffings	Christine	JNCC
Dobson	Mike	FBA
Driver	Alastair	Environment Agency
Eaton	Mark	RSPB
Edwards,	Bryan	British Lichen Society
Foster	Garth	Balfour Browne Club
Henderson	Ian	BTO
Hodgetts	Nick	British Bryological Society
Hurt	Laura	Peoples Trust for Endangered Species
Hutchinson	Nicola	Plantlife
Ismay	Barbara	Consultant - Dipterists Forum
Lambrick	Camilla	Oxford rare plants group
Lee	Paul	Hymettus Ltd
MacAdam	Craig	Ephemeroptera Recording Scheme/Buglife
Mitchell-Jones	Tony	Natural England
Peaty	Sarah	Environment Agency
Strachan	Ian	SNH
Stubbs	Alan	Buglife
Taylor	Ian	Natural England
Walker	Kevin	BSBI
Wallace	Ian	Liverpool museum
Whitehouse	Andrew	Buglife
Willing	Martin	Conchological Society

Two members of the Project Steering Group, Ant Maddock (JNCC) and Margaret Palmer (representing Wildlife and Countryside Link) attended and four members of Peak Ecology's staff acted as facilitators.

Table 2 (see below) shows the breakdown of the number of experts present for the different species groups. Fish had no representation and marine species only one expert. Some attendees covered more than one group. Northern Ireland was not represented.

2.3 Workshop details

Peak Ecology and the Project Steering Group agreed that the workshop should be a mix of plenary and break-out group sessions. The initial plenary session would be used to introduce the aims of the workshop and how it was proposed to carry out the assessment of actions; two interim plenary sessions would allow groups to feed back and would help promote consistency between groups. A final plenary session would allow open discussion on how to take the process forward, after the workshop.

The six break-out groups would deal with specific taxonomic groups; these were freshwater invertebrates, terrestrial invertebrates, vascular and non-vascular plants, fungi and lichens, vertebrates (birds, herptiles, fish and mammals) and marine species. Each group would have a computer and a paper copy of the information to fill in as they went.

A key issue within the break-out groups would be to focus the participants on whether the action is a one-off survey or research action and, most importantly, on assessing the actions as to their value in terms of filling a knowledge gap.

Highly ranked priority actions

Peak Ecology proposed that a series of questions be presented at the workshop for the experts to answer for each action for each species. The aim was to gather information on the action in order to assess its value in comparison with other actions, and to identify those actions that were clear enough to go forward immediately and those needing more work.

Four general questions were developed, these were:

- 1. To what degree will this action fill a gap in our current knowledge?**
- 2. Will this research or survey action yield direct management recommendations?**
- 3. Are other actions for this species reliant on the completion of this action?**
- 4. Grouping – can actions be grouped within or between taxa (habitat groups for example)?**

Question 1 was scored A, B or C reflecting a major, moderate or small gap in our knowledge that would be filled by the action.

Question 2 was scored A, B or C, to indicate clear, indirect or no obvious recommendations for management.

Question 3 was scored A (yes) or B (no).

The outcome for questions 1 to 3 would be a series of letter combinations for each action such that some would be scored AAA. This process would indicate where important knowledge gaps would be filled given the action for the species, and would identify those actions that were ready to go forward immediately and the level of relative urgency. Later on in the workshop, a further overall ranking of the actions would be undertaken, to check the impression given by the scores.

Question 4 was the grouping exercise and involved the provisional assignment of species/actions into groups (based on, for example, habitat or specific action) that could be put forward for funding together as one project., This could lead to a more efficient use of resources or a more effective overall project proposal.

As the lists were worked through, the status of species marked 'TBC' on the spreadsheets would be checked, to make sure that they were correctly categorised as monitoring/surveillance or management and so would not need to be considered further during the workshop.

3.0 RESULTS

3.1 Summary

Overall, 2048 actions across the different taxa were assessed at the workshop. Table 2 (see below) shows the overall breakdown of the results from the workshop. Comments made by the experts on all the actions are given in the Appendix to this report.

Of the 2048 actions listed on the spreadsheets, 842 were confirmed at the workshop as actions that were long term monitoring/surveillance or management and are not considered further in this report (see appendix spreadsheet entitled 'Actions not considered'). It should be noted that within the 'actions not considered' spreadsheet within the appendix, 3 actions are recommended to be combined into one action to give a single surveillance programme for 71 moth species.

1017 spreadsheet actions were assigned to Suite 1 (priority actions that could go forward now). 401 Suite 1 actions were ranked as highly important, either AAA or highly ranked by the relevant expert in the subsequent, post workshop assessment.

184 new actions and 99 additional actions were assigned to Suite 1 at the workshop (see section 3.4); of these extra 283 priority actions, 155 were ranked as highly important.

Suite 1 therefore has a total of 1300 priority actions, with 556 ranked as highly important.

189 actions were assigned to Suite 2, as they were already being carried out, or could not be assessed for another reason, such as insufficient time at the workshop or the relevant expert not being present.

It was agreed at the workshop that because there was no expert on fish present it would be appropriate to ask for additional assessments from experts after the workshop, using the same methods as the workshop, if they were able to provide input by 22 December 2008. This work was completed and the results are included.

This approach was similarly offered to the invertebrate group and the vascular plant group, as not all actions were assessed (no expert present or the group ran out of time). Actions for which no input could be obtained by 22 December 2008 would be dealt with as Suite 2 actions as outlined below. All information received by the deadline was included in the results.

Additional marine experts were also contacted to provide input as there was only one expert for marine issues at the workshop. However, no-one contacted for marine was able to provide input by the deadline and it is recommended that the marine actions be moved to Suite 2 for co-ordination by the BRIG secretariat.

The main focus of the workshop was to go through the actions and categorise them within the different suites. There was also discussion in a final plenary session about how the process was to be taken forward after the workshop and this is discussed in Section 4 (Final Plenary Session) of the report (see below).

The rest of the results section considers the results for the different groups separately.

Table 2. Overall workshop statistics broken down into the different taxonomic groups.

Column 2 shows the number of actions considered at and after the workshop. Column 3 shows Suite 1 actions, which are those research or one-off survey actions that could go forward immediately. Column 4 shows actions identified by the experts either as AAA from the workshop questions, or as highly ranked but not AAA. Column 5 shows Suite 2 actions considered not relevant to one-off survey or research, or where the actions needed to go back to the expert for clarification etc. Column 6 shows the new and additional actions for Suite 1. Column 7 shows the number of experts at the workshop for the different taxa (in brackets is the total overall contributing to breakout groups, due to some experts covering different groups). Column 6 shows the number of experts contacted outside of the workshop for clarification of the results and for gap filling.

Species Groups	Overall Actions prior to workshop	Number of actions rationalised for Suite 1	Number of highly ranked actions in Suite 1	Number of actions for Suite 2	New and additional actions proposed for Suite 1 at workshop	Number of experts at workshop	Number of experts contacted outside the workshop
Invertebrates	760	406	126	33	123	12 (13)	4
Birds	120	92	1	0	2	2 (3)	2
Herptiles	9	1	1	0	37	1	2
Fungi	199	128	73	0	4	2	1
Lichens	204	93	52	2	1	2	1
Vascular Plants	284	111	43	18	63	6 (7)	5
Non-Vascular Plants	165	103	63	0	50	2	2
Marine	203	0	0	130	0	1	5
Fish	70	61	37	3	0	0	2
Mammals	34	22	5	3	3	2	2
Totals	2048	1017	401	189	283	30 (33)	26

3.2 Suite 1 Actions

In total there were 1017 actions from the original spreadsheet assigned to Suite 1 of which 401 were highly ranked; in addition 283 new and additional actions were proposed for Suite 1 (see section 3.4 below) of which 155 were highly ranked (see appendix – Suite 1 spreadsheet). These are the priority actions that could be carried out straight away. Of these 1300 identified actions, 556 were highly ranked.

It should be noted that 36 of these Suite 1 actions include those actions that are proposed to be split into two actions (see below) and were therefore scored as a one-off survey. These were actions identified in the workshop that had more than one action within the text, and generally included both a monitoring element and a one-off survey element.

Table 3 summarises the number of actions that the experts proposed to split into two actions, one of which would become a new one-off survey or research action (so included in Suite 1 spreadsheet within the appendix) and the other would be a monitoring action (not included in 'actions not considered' spreadsheet in appendix).

For example, 16 of the vascular plant surveillance strategy actions were recommended to be split, creating one-off survey actions. This was described as - *Need to split this into ongoing surveillance and one-off surveys as part of the database development.*

All these actions were scored as one-off survey (Suite 1) by the experts.

Table 3. Number of actions proposed to be split to create a one-off survey action and a monitoring action across the different groups.

Species Groups	Number of actions experts proposed to split to create a one-off survey or research action
Invertebrates	20
Vascular Plants	16
Totals	36

3.2.1 Invertebrates

The invertebrates have been broken down into taxonomic groups for ease and clarity of reporting. Table 4 shows the Suite 1 actions assigned to the different taxonomic groups and the numbers that are highly ranked.

Table 4. Suite 1 actions from the original spreadsheet (not including new and additional actions) for the different taxonomic invertebrate groups considered at and after the workshop

Invertebrate Family Groups	Number of actions categorised as Suite 1	Number of highly ranked actions from Suite 1
Hymenoptera	15	2
Diptera	57	36
Lepidoptera	149	13
Coleoptera	65	34
Orthoptera	5	0
Neuroptera	2	2
Plecoptera	0	0
Hemiptera	4	3
Ephemeroptera	4	1
Trichoptera	6	4
Odonata	2	0
Arachnida	49	11
Crustacea	5	1
Other Arthropoda	6	1
Mollusca	33	15
Bryozoa	2	2
Worms	2	1
Totals	406	126

3.2.3 Numbers of research and survey actions

Table 5 shows the number of Suite 1 actions from the original spreadsheet (not including new or additional actions (see section 3.4) that were either research or one-off survey or in two cases where the action was considered to be both by the expert.

Table 5. Number of Suite 1 actions from the original spreadsheet that were either research or one-off survey or both (this does not include new or additional actions – see section 3.4)

Number of Suite 1 research actions	Number of Suite 1 one-off survey actions	Number of Suite 1 actions considered to be both research and one-off survey
484	531	2

3.3 Suite 2 Actions

Table 6 shows a summary of the actions assigned to Suite 2. In total there were 189 actions.

There were two reasons for an action being placed in being in Suite 2:

- actions which appear to be one-off survey or research, but which need clarification by the experts (174 actions)
- survey or research actions that are already being undertaken or are complete (14 actions)

Many of the actions for referral were the marine species. The reason for this was that there was only one marine expert at the workshop, and no other input from other marine experts could be carried out before the deadline. Further input is required before these actions can be allocated to Suite 1.

Table 6. Summary of Suite 2 actions for all taxonomic groups. These actions were separated into different categories for Suite 2 as actions needing referral or actions being completed already.

Species Groups	Number of Suite 2 actions	Number of actions to be referred back to expert for clarification	Number of actions that were completed or being done
Invertebrates	33	30	3
Vascular Plants	18	12	6
Lichen	2	0	2
Marine	130	130	0
Fish	3	3	0
Mammals	3	0	3
Totals	189	175	14

3.3.1 Invertebrates

Table 7 shows the breakdown of invertebrate actions for Suite 2.

Table 7. Total number of Suite 2 actions for invertebrates, broken down into the different taxonomic groups. These actions were separated into different categories for Suite 2 as actions needing referral or actions being completed already.

Invertebrate Groups	Number of Suite 2 actions	Actions which were to be referred back to expert for clarification	Actions that were completed or being done
Hymenoptera	3	0	3
Diptera	1	1	0
Coleoptera	26	26	0
Arachnida	3	3	0
Totals	33	30	3

3.4 New and additional actions

As part of the workshop, experts proposed a number of new actions for addition to Suite 1. The general feeling was that the signposting actions had originally been written in a general way, whilst the criteria discussed at the workshop were specific. In addition, some experts proposed to add actions already in the signposting database but which were not categorised as survey/monitoring or research and were not included in the 2048 actions assessed for the workshop.

Table 8 shows the overall number of proposed new and additional actions for the different groups.

Table 8. New actions and additional existing signposting actions proposed to be put forward as one-off survey or research by experts both prior to the workshop (herptiles) and within the workshop.

Species Groups	Number of new actions for Suite 1 proposed by experts	Number of actions to be added to Suite 1 from wider signposting spreadsheet	Number of highly ranked new actions	Number of highly ranked additional actions
Invertebrates	120	3	103	1
Birds	2	0	0	0
Herptiles	37	0	20	0
Fungi	4	0	4	0
Lichen	0	1	0	1
Vascular Plants	18	45	18	5
Non-vascular Plants	0	50	0	1
Mammals	3	0	2	0
Totals	184	99	147	8

The majority of new actions proposed were for the invertebrate group (see Table 9 for breakdown). Also, 18 new actions were proposed for the Herptiles prior to the workshop and were assessed at the workshop. Subsequently, another 17 actions were added, and one was removed giving a total of 37 new Herptile actions. These were proposed and assessed by the relevant experts, which gives weight to adding them into the database to go forward as Suite 1.

18 new vascular plant actions were added in by the relevant experts, and relate to species that require a baseline of survey information. These are considered to be urgent, and are highly recommended to be added in as Suite 1 actions.

Table 9 shows the breakdown of new invertebrate actions across the groups.

Table 9. New actions proposed to be put forward as one-off survey or research by experts for invertebrate groups both prior to the workshop and within the workshop.

Invertebrate Groups	Number of new actions for invertebrate groups for Suite 1 proposed by experts	Number of highly ranked new actions
Diptera	1	1
Coleoptera	12	9
Lepidoptera	95	92
Arachnida	1	0
Orthoptera	1	0
Plecoptera	3	0
Hemiptera	3	0
Bryozoan	1	0
Other Arthropoda (Millipede)	2	0
Trichoptera	1	1
Totals	120	103

The majority of new actions proposed for the invertebrates were within the Lepidoptera and Coleoptera. 24 of the Lepidoptera actions are concerned with identifying management prescriptions for butterfly species habitats, which would involve initial survey work to gather baseline information. The other 71 actions are based on a research proposal for 71 moth species that are in decline.

The majority of the existing actions that were proposed for addition to the Suite 1 one-off survey and research actions from the wider signposting database were for the vascular and non-vascular plants. They were considered to have a research component and needed to be

included within Suite 1. The three actions to be added into Suite 1 for invertebrates were for Odonata species.

Table 10 shows the breakdown of new and additional actions in terms of whether they were research or survey actions.

Table 10. New and additional actions that were either one-off survey or research.

New one-off survey actions	New research actions	One-off survey actions added from wider spreadsheet	Research actions added from wider spreadsheet
27	157	30	69

3.5 Actions recommended to be combined

Experts from different groups decided that some actions, for a given species, that were worded differently were essentially the same action. It was proposed that these should be combined into one action. These actions are highlighted within the 'combining actions' spreadsheet in the appendix, but are not combined within the Suite 1 spreadsheet; the decision to combine these actions is outside the remit of this report.

Table 11 shows the breakdown of proposed actions to be combined across groups. The majority of these were for the invertebrates. Only two vascular plant actions were proposed to be combined into one (Actions 2 & 3 for *Stellaria palustris*).

Table 11. Number of actions proposed to be combined into one action for the different taxon groups. These actions have yet to be combined, and therefore remain as separate actions within Suite 1.

Species Groups	Number of actions which can be combined into one action.	Number of actions resulting from combining actions into one.
Invertebrates	52	25
Vascular Plants	2	1
Totals	54	26

Table 12 shows the number of proposed actions to be combined within the invertebrates.

Table 12. Number of invertebrate actions proposed to be combined into one action within taxonomic groups. These actions have yet to be combined, and therefore remain as separate actions within Suite 1.

Invertebrate Family Groups	Number of actions which can be combined into one action.	Number of actions resulting from combining actions into one.
Diptera	21	10
Coleoptera	4	2
Arachnida	25	12
Other Arthropoda	2	1
Totals	52	25

3.6 Actions needing additional information

Following analysis of the database, there were actions that were identified as having only a small amount of information, which made it difficult to assess the work required in terms of being taken forward. These had additional information proposed for the action by the relevant expert at the workshop, which then made them valid for inclusion as Suite 1 (these actions are included within Suite 1, but are also put into a separate spreadsheet within the appendix ('Suite 1 with additional info') so that they can be easily identified (with the proposed new text in the comments column).

Table 13 shows the taxonomic groups which had additional information written to clarify the detail required for the action to be taken forward. The majority were in the invertebrate group.

Table 13. Number of actions for which experts wrote additional information to clarify or develop the original action.

Species Groups	Number of actions the experts proposed to add information for clarification or additional survey/research at workshop
Invertebrates	55
Birds	3
Lichens	2
Totals	60

3.7 Groupings

Groups of Suite 1 actions were put together on a provisional basis by the experts, and decisions were made on a potential cost saving basis. This was often driven by the fact that if a survey was going to be done for one species within a particular habitat then it would make sense combine actions to survey for other BAP species found within the same habitat.

Other groupings were based on the same action for a group of species, such as DNA work; again this was a logical rationalisation given that the same equipment would be used and therefore the cost of doing several species as a group would most likely cost less than doing the same work individually.

Potential groups were assigned as the experts worked through the actions and sometimes another species for a potential group did not come up. These cases ('failed action groupings') are not included within the report, but are highlighted within the Suite 1 spreadsheet in the appendix.

The analysis is again split into the different taxonomic groups for ease of presentation.

3.7.1 Invertebrate Grouping

The invertebrate experts considered grouping for both inter-taxonomic and intra-taxonomic projects. Although time constraints meant that inter-taxonomic groupings were not fully explored, some potential groups, usually based around shared habitats, were identified. Further work to expand these to include other taxonomic groups and to identify more groups may be of benefit.

Intra-taxonomic groupings were identified for five groups for both research and one-off survey actions, some of which can be found in the inter-taxonomic groupings as well. Those taxonomic groups where groupings were not made were either not suitable or were not worked through, due to a lack of time. Again, work to identify more intra-taxonomic groups may be of value.

Tables 14a and 14b summarise the invertebrate research groups and Table 15a and 15b summarise the invertebrate one-off survey groups. The details for the groupings are found in the appendix, within the 'Suite 1' spreadsheet and in the 'action groupings' spreadsheet.

It should be noted that within the inter-taxonomic groups some species groups only have one action and are therefore not included within the intra-taxonomic groupings. For example, in the heathland research inter-taxonomic group (Table 14a) there were nine actions across four taxonomic groups. Five of these are for Arachnida, two are for Lepidoptera and one is for Diptera and Coleoptera. The Arachnida and Lepidoptera research actions are found in the intra-taxonomic groups (Table 14b) also, as they had more than one species associated with heathland. However, Diptera and Coleoptera are not because there was only one heathland research action for Diptera and Coleoptera identified, but the single actions are retained to facilitate inter-taxon groupings.

Table 14a. A summary of Inter-taxonomic grouped research actions for invertebrates. The managed retreat group consists of different habitat types, which are included for clarity.

Research Group		Number of actions	Number of species	No. of taxonomic groups
Managed Retreat	Lagoons	1	1	1
	Dunes	2	2	1
	Coastal Flood Plain	3	2	1
	No habitat specified	2	2	2
Heathland		9	9	4
Brownfield		4	4	2
Fen		2	2	2
Rotten Tree Stumps		2	2	2
Exposed and other Riverine Sediments		5	5	2

Table 14b. A summary of Intra-taxonomic grouped research actions for invertebrates.

Taxonomic Group	Research Group	Number of actions	Number of species
Coleoptera	Exposed and other Riverine Sediment	3	3
	Oil Beetles	3	3
	Soft Cliffs	3	2
Diptera	Riverine Sediment	2	2
	Malloch Society ¹	4	4
	Lipsothrix species	3	3
Arachnida	Managed Retreat – Dunes	2	2
	Heathland	5	5
Lepidoptera	Reedbeds	2	2
	Declining Moths	71	71
	Brownfield	3	3
	Bracken	3	3
	Grassland	5	5
	Heathland	2	2
	Woodland	6	6
Mollusca	Managed Retreat - Coastal Flood Plain	3	2
	Bivalve	2	2

¹ The Malloch Society is already set up to carry out research on Diptera. It was considered that a cost effective research project would be for the Society to carry out the actions identified.

Table 15a. Inter-taxonomic grouped one-off survey actions for invertebrates. The managed retreat group consists of different habitat types, which are included for clarity.

Survey Group		Number of actions	Number of species	No. of taxonomic groups
Managed Retreat	Lagoons	3	3	3
	Dunes	5	5	2
	Coastal Flood Plain	3	2	1
	Saltmarsh	2	2	1
	No habitat specified	2	2	2
Heathland		16	16	3
Fen		3	3	3
Rotten Tree Stumps		2	2	2
Damp Acid Grassland		2	2	2
Pisidium Group		2	2	2
Temporary Ponds Group		3	3	3
Exposed and other Riverine Sediment		5	5	2

Table 15b. Intra-taxonomic grouped one-off survey actions for invertebrates.

Taxonomic Group	Research Group	Number of actions	Number of species
Coleoptera	Saproxyllic	3	3
	Soft Cliffs	2	2
	Oil Beetles	3	3
	Heathland	6	6
Diptera	Fungi Associated	2	2
	Malloch Society	5	5
	Exposed and other Riverine Sediment	4	4
	Heathland	3	3
	Dolichopus	2	2
Arachnida	Managed retreat - Dune	4	4
	Managed retreat - Saltmarsh	2	2
	Heathland	7	7
Lepidoptera	Reedbeds	2	2
	Arctostaphylos heath	2	2
Mollusca	Managed retreat - Coastal Flood Plain	3	2
	Bivalve	2	2

Other cross taxonomic groupings suggested by the mollusc group have been left out of this table because they were species-specific groups. These groupings were:

- *Myxas glutinosa* (mollusc – species no. 468) with *Corrigiola litoralis* (vascular plant – species no. 2195).

- *Margaritifera margaritifera* (mollusc – species no. 437) with the fish *Salmo salar* (species no. 2579) and *Salmo trutta* (species no. 2580).
- *Pisidium tenuilineatum* (mollusc – species no. 520) with the fish *Petromyzon marinus* (species no. 2494) and *Lampetra fluviatilis* (species no. 2360).
- *Segmentina nitida* (mollusc – species no. 570) with the bird *Vanellus vanellus* (species no. 2687) – possible addition to managed retreat – grazing marsh.

It was also suggested that a project could be undertaken to search for BAP priority species in preserved invertebrate samples, obtained during routine river monitoring by the Environment Agency.

3.7.2 Non-invertebrate groupings

Groupings for all the non-invertebrate species actions (birds, fungi, lichen, vascular plants, non-vascular plants, marine and fish) are summarised in Tables 16 & 17. Table 16 summarises the grouped research actions and Table 17 summarises the grouped one-off survey actions. The detail and actions involved are found in the appendix, within the 'Suite 1' spreadsheet and in the 'action groupings' spreadsheet.

Table 16. Intra-specific grouped research actions for birds, fungi, vascular plants, non-vascular plants, fish and lichens.

Species Group	Research Group	Number of actions	Number of species
Birds	Migrant decline research	7	7
	Effects of climate and land-use change	4	4
	Western Atlantic bird community	2	2
	Special Protection Area effectiveness	2	2
	Effects of forestry management	2	2
	Taxonomic research into endemic status	2	2
	Research on pastoral management	8	8
	Effects of renewable energy projects	2	2
Fungi	All fungi for DNA based studied (DNA bar-coding, probe development) and analysing habitat variables	60 (inc. 4 new actions)	60 (inc. 4 new actions)

Continued...

Species Group	Research Group	Number of actions	Number of species
Vascular Plants	Mycorrhizal association research	10	10
	Research into understanding dispersal methods and vectors of dispersal	6	6
	Research into native status	3	3
	Research into species autecology	5	5
	Eyebright identification handbook	11	11
	Montane species on skeletal substrate	7	7
	Nutrient rich habitats	2	2
	Woodland edge	2	2
	Restoration of under-grazed grassland	3	3
	Alchemilla species	5	5
Non-Vascular plants	Ex-situ group (needs further clarification)	40	40
Fish	Atlantic salmon and sea trout	7	2
	Allis and twaite shad	7	2
	River and sea Lamprey	10	2
	Coregonus species	5	3
Lichen	Calcareous terricolous (Brecklands) group	3	3
	Rain track Group	3	3
	Wound track Group	3	3

Table 17. Intra-specific grouped Survey actions for fungi, lichen, vascular plants, non-vascular plants and fish.

Species Group	Survey Group	Number of Actions	Number of Species
Fungi	Wetland	3	3
	Scotland - scots pine	12	12
	England & Scotland – scots pine	3	3
	Botanical linked fungi	11	11
	Waxcaps in grassland	2	2
	Beech woodland	3	3
	Earthstars	6	6
	Boletes	5	5
Stipulate hydroids	4	4	

Continued...

Species Group	Research Group	Number of actions	Number of species
Lichen	Atlantic hazelwood group	2	2
	Calcareous terricolous (Brecklands) group	2	2
	Limestone lichens	2	2
	Mendip limestone group	2	2
	Rain Track	5	5
	Oceanic woodland group	11	11
Vascular Plants	Arable	4	4
Non-Vascular Plants	Coastal <i>Bryum</i> species	3	3
	Dung/animal remains group	3	3
	Mine-waste	2	2
	Reservoir margins	4	2
Fish	Allis and twaite shad	4	2

4.0 FINAL PLENARY SESSION

A plenary session at the end of the workshop was conducted to assess the way forward in terms of the work done at the workshop. Three issues were raised and discussed:

- Prioritisation of Suite 1 actions
- Dealing with actions not covered at the workshop
- Taking forward project proposals

Ranking Suite 1 Actions

This discussion focussed on whether the actions that scored AAA should be put forward as the most important. The consensus was that although all actions in Suite 1 were priority, the most highly ranked actions should be taken forward first. These would incorporate most of the AAA actions, but there may be some highly ranked actions that were not AAA.

There had not been time in the workshop to rank all the Suite 1 species, so this process needed to be completed for some groups. It was agreed that Peak Ecology would send out the spreadsheets to relevant experts, who would be asked to complete the ranking exercise by 22/12/08. All relevant groups carried this out and the information received was included in the results

Actions not covered at the workshop

Some actions (for fish, some invertebrate groups and some marine groups) were not covered at the workshop because the experts were unable to attend. It was agreed that sections of

the spreadsheet would be sent to the relevant people, with a request that they score and rank these actions by 22/12/08. All information received was included within the results.

Taking forward project proposals

There was strong support for taking these actions forward, especially for the more obscure species that have consistently missed out on funding opportunities. Further, it was hoped that the workshop outputs would give weight to funding proposals and that BRIG and BRAG would endorse the findings and support the recommendations.

Notwithstanding this, there was a recognition that there is no structure in place for such funding proposals to be worked up and delivered. To resolve this problem, it will be essential to agree a structure for delivery that enables all relevant partners to be involved.

5.0 SUMMARY AND RECOMMENDATIONS

The aim of this workshop was to assess and rationalise the research and survey/monitoring actions from the signposting database. In essence this meant making the database more manageable, in order to facilitate the implementation of the actions written for the 1150 BAP priority species. The project involved bringing together relevant experts to analyse this element of the database and to place the research and one-off actions into different Suites. The rationalised actions will then be taken forward to BRIG and BRAG, with the ultimate aim of agreeing a structure to enable implementation and delivery of conservation actions.

Suite 1 actions

1300 actions were put forward as 'Suite 1' (see the Suite 1 spreadsheet in Appendix). It was agreed that these actions were clear, ready for implementation and relevant in terms of taking forward the conservation of the species. 556 of these priority actions were highly ranked.

New Suite 1 issues arising in the workshop

In the original spreadsheet, 1017 actions were highlighted as Suite 1, but as the workshop progressed, new issues were highlighted by the experts. The most important were:

- the identification of a limited number of new actions that were not included in the original spreadsheet
- the need to consider additional actions for research and survey that had been misplaced in other sections of the wider signposting database

All these actions have been incorporated into Suite 1. This amounts to 283 actions, of which 155 actions were highly ranked.

This gives a total of 1300 Suite 1 actions, of which 556 were highly ranked.

A key recommendation of the workshop is that Suite 1 actions, all of which are priority, should be implemented without delay. The initial focus should be on actions flagged up by the experts as highly ranked.

Suite 2 actions

189 actions were proposed as Suite 2 actions (see the Suite 2 spreadsheet in Appendix).

There were two categories:

- actions which appear to be one-off survey or research, but which need clarification by the experts (175 actions)
- survey or research actions that are already being undertaken or are complete (14 actions)

The recommendation is that all these actions should be referred back to the originators for clarification. Those Suite 2 actions confirmed as one-off survey or research will be put forward for implementation in the same way as Suite 1 actions.

Grouped actions within Suite 1

Whilst working through the actions, workshop participants were asked to consider if similar actions for different species could be grouped. The reason for identifying possible groups was to promote effectiveness and efficiency of delivery.

The recommendation is that some research and one-off survey actions should be grouped, in the manner indicated in Section 3. These grouped Suite 1 actions should be taken forward as soon as possible.

6.0 BEYOND THE WORKSHOP

The workshop fulfilled its aims of bringing together experts to endorse proposals for research and one-off survey actions for priority species, and to produce suites of actions that can be taken forward in a logical way. The success of the workshop will be judged by the effectiveness of the programmes that are developed as a result of this rationalisation process.

7.0 APPENDIX

The appendix is an associated Excel Workbook with six spreadsheets titled:

- Suite 1
- Suite 2
- Actions not considered
- Suite 1 with additional information
- Combining actions
- Action groupings