



**The
UK Terrestrial Biodiversity Surveillance
Strategy**

**Providing sampling that measures the success
criteria for UK BAP species and habitats**

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Providing sampling that measures the success criteria for UK BAP species and habitats

1. Introduction

- 1.1 Following a priority review process, a new UK Biodiversity Action Plan list of 1149 priority species and 65 priority habitats was produced in June 2007. Each of the species and habitats has a status related success criterion, which is the point where priority attention is no longer needed to retain the species or habitat as part of the environment in the UK.
- 1.2 The purpose of this paper is to propose a cost effective means of providing the repeat sampling¹ that would allow the success criteria to be assessed.
- 1.3 A paper was presented to the Standing Committee in October 2006, advising on how to meet the sampling gaps identified in the reporting process for the original priority list of 577 species and 49 habitats.² This paper builds on that advice, recognising that the priority list has now increased considerably in size. The paper presents the results of an investigation undertaken by JNCC to deliver sampling relevant to the success criteria for the majority of priority species and habitats in the most cost effective way. The methods used in the investigation and the results obtained are outlined below. Surveillance requirements other than BAP were also considered during the investigation.

2. Methods

- 2.1 *Information collation.* Information on existing species or habitat annual or multi year cycle repeat sampling was collated to provide an overview of the current situation. All 'survey schemes' were included, whether organised by public agencies, NGOs, academic bodies or industry³. Information included details of scheme objectives, the organisations/bodies involved, cost, periodicity, and species/habitat coverage. The results of the collation exercise are provided in a table as Appendix 1 and covers 73 separate schemes, or groups of schemes, both currently running or as proposed schemes. The survey schemes cover all the biodiversity that is sampled, not just the BAP species or habitats.
- 2.2 *Assessing current coverage.* The effectiveness of the existing survey schemes was assessed for:
- providing sampling that covers the UK BAP priority species and habitats, and
 - measuring the success criteria.

To make a judgement on the effectiveness of a scheme it was assumed that sampling would have to deliver information that would allow change in status of the species or

¹ Surveillance and monitoring are both terms widely used interchangeably and this can cause confusion. Repeat sampling is used here to mean periodically measuring the state of a species or habitat using a method that allows detection of change in status through time.

² Paper to UK Standing Committee 'Proposed Method to Fill Survey Gaps in the Current List of UK BAP Species'.

³ The summary is believed by JNCC to be pretty complete, it is based on the Environmental Research Funders Forum collation of sampling activity but considerably updated.

habitat to be assessed at least every 6 years. This periodicity was selected because of the existing time frame for protected site monitoring e.g. the Common Standards Monitoring 6 year reporting cycle and Habitats Directive Article 17 reporting of conservation status. Current coverage is identified in column 2 of Table 1 and shows percentage of BAP species or habitats that have information on short term trends, unless otherwise stated.

- 2.3 *Assessing surveillance gaps.* The Priority Habitats and Species Review Group have provided signposting and actions for the listed species, and these include the need for survey where it was thought sampling is not in place. This information was used as a cross check on the gaps in coverage from sampling schemes.
- 2.4 *Assessing cost of filling surveillance gaps.* Once gaps in coverage were identified, the most cost effective ways of providing the required sampling were considered. The results of the collation and gap identification exercises showed that many species and habitats are not covered by current sampling for good reasons. They may have a limited but fragmented distribution that does not overlap with other BAP species or habitats. Where distributions do overlap it may take multiple visits to deliver the sampling, because the species/habitats require a variety of methods or expertise to undertake the sampling. Volunteers make a huge contribution to sampling generally, but in these situations the number of sampling locations and effort required is, in many cases, beyond the realistically available volunteer time or interests.
- 2.5 *Costs of recommended adjustments.* Given the problems of sampling, two cost estimates were made for closing the gaps. The first estimate considered modifications or enhancements to the existing sampling that would yield additional species or habitat cover for modest cost and that would be reasonably easy to introduce. Considerations included: modifying existing schemes; whether volunteers could undertake sampling or whether professionals would need to be employed; and whether there were simple ways of aggregating sampling of different kinds for different species or habitats. The co-ordination and sampling effort was then estimated and costed using the closest comparable existing sampling as a model. The cost of recommended adjustments for species groups and habitats is provided in column 3 of Table 1. Column 4 of Table 1 indicates the additional percentage coverage achieved through the recommended adjustments.
- 2.6 *Costs of full coverage.* The second estimate was produced assuming full coverage of listed species and habitats is needed within 6 years. A solution to each gap in coverage was identified using knowledge of existing methods, and then the costs of the solutions were estimated. Where full coverage was considered possible, the cost is provided in column 5 of Table 1 and is additional to the costs of the recommended adjustments.
- 2.7 In order to allow the costs of all sampling to be compared, cost estimates for existing sampling and for the additional sampling have been calculated as annual expenditure for both the recommended adjustments and for full coverage. Where sampling is organised on a multi-year basis, i.e. expenditure is on periodic surveys, the costs have been converted to the annual equivalent.
- 2.8 The additional costs identified in table 1 and appendix 2 would be needed by the organisations involved in each area of surveillance i.e. there is no implication that the identified costs would either be funded by JNCC or that JNCC would necessarily be the body to deliver any additional sampling. Appendix 1 identifies the relevant organisations for each area of sampling.

3. Results

- 3.1 *Summary of cost.* Table 1 provides the summary of the costs produced from the work outlined above. It is supported by appendix 2 which gives a summary of the actual sampling, the way it could be modified and the basis of the costs. It also identifies the organisations involved in each area of surveillance. There is no implication at this stage that these bodies have the resources to meet any new costs identified to meet any of the additional sampling.
- 3.2 It is estimated that the current known expenditure by the public sector and NGOs on species surveillance is roughly £2,880,000. The current known expenditure on habitat surveillance is estimated to be £4,200,000, which includes major individual multi delivery schemes such as Common Standards Monitoring, the Countryside Survey and Agri-Environment Schemes. The overall total known annual expenditure on species and habitats surveillance is estimated to be roughly £7,080,000. This figure is a rough estimate and is likely to increase when more complete information is available.
- 3.3 In addition, approximately £4,000,000 is spent annually on other multi delivery habitat/species schemes such as the Ecological Change Network which measures environmental change and Local Record Centres that collate and manage species and habitat recording information and are involved in some survey. These schemes are included as part of the 73 species and habitat schemes documented in appendix 1. However, it is difficult to know what proportion of expenditure can be applied to species or habitat surveillance directly.
- 3.4 *Current coverage.* For habitats sampling, current coverage delivers sufficient information to assess success criteria for 19% of BAP priority habitats. Some species groups have much better coverage than others, with birds, butterflies and moths and mammals having the highest percentage coverage and other invertebrates, lichens and vascular plants having the lowest percentage coverage. For bryophytes and fungi it is not possible at present to provide short term trends. On average across all species groups current surveillance provides information on 48% of BAP priority species.

Table 1. Summary of costing of adjustments to improve surveillance cover of BAP species and habitats. (refer to Appendix 2 for further detail)

HABITAT/ SPECIES GROUP	CURRENT COVER <i>% of BAP priority listed habitats/ species covered now</i>	COST OF RECOMMENDED ADJUSTMENTS (£ PER ANNUM) <i>Cost effective additions or changes to the existing sampling effort</i>	COVER WITH RECOMMENDED ADDITION <i>% of BAP priority listed habitats/ species covered after adjustments</i>	COST FOR 100% COVER (£ PER ANNUM) <i>Additional to the recommended adjustments</i>	OTHER PRIORITIES FOR SAMPLING <i>A flag that JNCC believes there are other objectives that need to be considered before making adjustments.</i>
Amphibians and Reptiles	40% (4 of 10)	72,000	100%	not applicable	Yes
Birds	92% (54 of 59)	22,000	97%	117,000	
Bryophytes	40-60% (44-66	10,000	100% (111 species)	40,000 (to	Yes

	of 111) with baseline information, no trends.		with baseline information and probably 25 year trends. Only approximately 10% (11 of 111) with short term trends i.e. 6 years	cover 100% species for short term trend i.e. 6 years)	
Butterflies and Moths	85% (149 of 174)	0	85%	85,000	
Invertebrates (other than butterflies and moths)	8% (20 of 237)	20,000	~ 82% possible	30,000	Yes
Freshwater Fish	Information being compiled				Yes
Fungi	100% (77 of 77) with baseline data accumulated since 1960, possibly 30% with more recent baseline, no trends	10,000	No improved cover but information on whether there are viable sampling methods produced.	Full coverage not possible currently	
Lichens	22% (30 of 138)	15,000	100%	90,000	Yes
Mammals (Terrestrial and Freshwater)	72% (13 of 18)	30,000	83% (15 of 18)	40,000	Yes
Vascular plants	25% (54 of 212)	150,000	71% (151 of 212)	80,000	Yes
Habitats	19% (8 of 42)	440,000	100% (26% [11] not fully covered on 6 year cycle)	>500,000 (to provide full coverage on 6 year cycle)	Yes

3.5 *Cost of recommended adjustments.* The recommended additional sampling for species adds £330,000, or 12%, to the existing species costs. The recommended additional sampling for habitats adds £440,000, or 11% to the existing habitat costs. The total cost of recommended adjustments for both species and habitats is approximately £770,000 adding 11% to the overall budget of £7,080,000 currently spent.

3.6 The recommended adjustments for species increase the average coverage across all species groups from 48% to 83%. This is a 35% increase in coverage for a 12% increase in expenditure. The recommended adjustments for habitats increase coverage from 19% to 74% fully covered on a six year cycle. This is a 55% increase in coverage for an 11% increase in expenditure.

- 3.7 *Cost of full coverage.* Aiming for 100% coverage adds a total of £811,000, or 28%, to the existing sampling effort for species. The overall coverage for habitats adds at least £940,000, or 22%, to the existing sampling effort. Full coverage, including recommended adjustments, adds £1,750,000, or 25%, to the overall costs.
- 3.8 *Volunteer value.* The contribution by volunteers to all existing sampling (i.e. not just BAP) is estimated at £16,010,028. The cost of paying professionals to cover the sampling time undertaken for free by volunteers would not be the same as the total estimated volunteer value, because it is likely surveillance schemes would be designed slightly differently if professionals were routinely employed. However, the enormous value of the volunteer effort is an indication of the true cost of providing this level of surveillance if all aspects had to be fully funded.
- 3.9 *Other considerations for sampling.* The cost estimates are provisional and based on incomplete information at present. Some reduction in the estimated costs to provide 100% cover would be possible if resources were put into logistical planning i.e. comparing the distributions of BAP species and habitats and developing analytical methods to combine representative sampling with the most economical visit patterns and deploying of available expertise. Detailed planning would also reveal the true overlap of the BAP requirement with others, for example many BAP species will have a significant portion of their distribution on SSSIs. Common standards monitoring on SSSI may provide some of the picture, or place people with relevant expertise on the sites able to do the BAP sampling. However, the reduction is unlikely to be more than 10 or 20% in effort.
- 3.10 There is a more complex factor affecting surveillance costs. If management of the locations where many of the scarce BAP priority species occurs involves ensuring the features of the habitats they need are maintained, it is likely that the management activity will sample the species, negating the need for separate surveillance. However it may still be more efficient for sampling of the species to be done by experts and locations to be managed for the features they need by others who don't have the identification expertise for the species.. This level of integration will be come clearer as the actions for priority species become available..

4. Conclusions

- 4.1 The UK Biodiversity Partnership has produced a new strategic framework 'Conserving Biodiversity – The UK Approach', in which the country biodiversity strategies link their aims to provide important overall outcomes for biodiversity. The framework focuses on the importance of the ecosystem approach for delivering biodiversity conservation and coping with the overall threats from climate change. One of the main priorities to deliver biodiversity objectives is to develop and interpret the evidence base. This involves: assessing the current status and trends in biodiversity; understanding the value of biodiversity and ecosystem services; understanding the reasons for unfavourable status and decline in biodiversity; assessing future vulnerability and identifying effective remedial measures and strategies; assessing the outcomes and effectiveness of policy; and being innovative in the way we collect, manage and use evidence to support policy and action.
- 4.2 The need to measure UKBAP species and habitats against their critical success factors is identified as one important driver for sampling, but to get the best solutions and to make the most cost effective investments, sampling needs to be planned by considering the range of requirements for measuring change in biodiversity and looking for synergy in the way they are delivered.

- 4.3 We know with climate change, and lots of factors likely to drive land use change (e.g. food and fuel security), that there is a new generation of problems in retaining biodiversity whilst achieving sustainable development. Well designed sampling has a role in providing early evidence of the impacts on biodiversity to help identify the best policy response. Finally the Habitats Directive, Birds Directive, Wildlife and Countryside Act add further reporting requirements imply or require relevant sampling.
- 4.4 During the work to identify how to provide the sampling for the BAP list these other types of requirement were considered. Table 1 and appendices 1 and 2 indicate where there are 'other priorities for sampling' and where there is clearly a need to balance BAP requirements against the resource needs of the other objectives. For example, is it better to have 100% sampling coverage of BAP priority habitats and species or to meet one of the other requirements and to try to provide the best synergistic approach to surveillance?
- 4.5 We need a mechanism that can build up an integrated solution to requirements as they emerge and change, so that we don't have wholly separate mechanisms for picking out how biodiversity responds to climate change, non natives are detected, alerting us to the implications of land use change, and for providing cover for each of the needs of the various policy and legislative requirements.