



**Costs of the UK Biodiversity Action Plan - Update**

**May 2010**

Costs of Implementing the UK Biodiversity Action Plan –

2010 Update

Defra

A final report submitted by GHK

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# INTRODUCTION

GHK Consulting Ltd (GHK), in conjunction with RPS Ecology (RPS), was commissioned by Defra in January 2010 to update estimates of the costs of delivering the UK Biodiversity Action Plan (UKBAP).

The aim of this short study was to update previous estimates developed through a more detailed assessment completed by GHK and RPS in 2006, in order to make comparisons with new estimates of the benefits of the UK Biodiversity Action Plan derived from a current study by the University of Aberystwyth. Together these two projects will help to inform an analysis of the relative costs and benefits of the UK BAP and to identify implications for policy.

This draft final report presents the findings of the study for discussion with Defra and partners. It is structured as follows:

* Section 2 sets out the methods used to update the cost estimates;
* Section 3 presents an updated estimate of the costs of delivering Habitat Action Plans (HAPs);
* Section 4 presents an updated estimate of the costs of delivering individual species action plans (SAPs);
* Section 5 presents updated estimates of the costs of action for widespread species;
* Section 6 presents new estimates of the levels of funding that help to contribute to UKBAP priorities;
* Section 7 presents the overall conclusions of the study, with regard to the overall costs of the UKBAP and the extent to which these are matched by available funding.

There are three annexes:

* Annex 1 lists the consultees who provided information for the HAP costings update;
* Annex 2 describes the work completed to update the widespread species costs;
* Annex 3 presents details of the revised estimates of UK BAP expenditures.

# Method

## Overview of Approach

The previous costings study involved a detailed assessment of the costs of delivering the UKBAP, including examination of:

* The costs of delivering each individual HAP, based on identification of appropriate unit costs of targets and actions;
* The costs of delivery of a sample of individual SAPs, which were extrapolated to estimate the costs of delivering SAPs overall;
* The costs of actions for a group of widespread species, based on the development of an ecological model for farmland bird populations;
* An analysis of funding relevant to UK BAP priorities[[1]](#footnote-1).

An update of the previous costings needs to reflect a variety of developments since 2006, which include:

* Updated species and habitat targets, through the recent targets review which was not fully complete when the previous costings were undertaken;
* A revision of the list of priority species and habitats, completed in 2007;
* Changes in some of the payment rates under agri-environment and woodland grant schemes, which accounted for a large proportion of the previous cost estimates;
* Possible changes in priorities and actions for the delivery of some HAPs;
* Changes in BAP related expenditures since 2006;
* General inflation.

Despite these changes, the overall basis of the previous costings remains valid. The earlier costings exercise provided a cost model designed to be updated as targets and unit cost estimates changed in future. Therefore, rather than repeating the previous costings exercise in detail, the current study has updated the previous estimates using the existing model, employing targeted research to update data inputs where appropriate.

The current study has updated each of the main elements of the previous estimates, providing revised estimates of:

* HAP costs;
* SAP costs – individual species;
* SAP costs – widespread species;
* BAP funding estimates.

The work completed to update these different elements is described in the following sections.

The work has sought to provide estimates of the annual cost of HAP and SAP delivery in the 2010 to 2020 period, and latest estimates of BAP funding. All estimates are expressed in 2009 prices, to facilitate comparison with estimates of the annual benefits of delivering the UK BAP.

## HAP Costings

The original costing for terrestrial HAPs identified appropriate per hectare management, creation and restoration costs, and applied these to the HAP targets. For freshwater and marine HAPs that do not involve a land management approach the broad areas of activity required for delivering HAP targets were identified and costed, in consultation with HAP partners. An allowance was added to identified costs of habitat management to allow for administration and central costs.

Cost estimates for each HAP were developed using a spreadsheet model combining data on targets and unit costs. The estimates were provisional as the costings work coincided with the targets review, and not all of the revised targets had been finalised by the time the costings work was concluded. The methodology and results were set out in a detailed report with annexes[[2]](#footnote-2).

Key changes since the 2006 costings report include:

* The completion of the targets review, which has resulted in changes in agreed targets for some habitats;
* New developments in agri-environment and woodland management schemes, which have changed payment rates on which many of the terrestrial HAP costings in particular were based;
* Other changes in unit costs, for example as a result of general inflation;
* Progress in HAP implementation, which may potentially have changed planned actions. This is most likely to affect costings for those marine, coastal and freshwater HAPs that were based on anticipated actions rather than land management targets.

This update applies a similar methodology to the earlier costings, taking into account revised HAP targets and unit costs. Where unit costs are based on agri-environment (AES) or other grant schemes these have been updated to reflect the latest payment rates. Capital costs have been adjusted for inflation where figures are based on historic cost estimates. As before an allowance of 15% is added to land management costs to cover administrative and co-ordination costs.

For those non-terrestrial HAPs where costs are based on an identified programme of work rather than on area targets, interviews have been undertaken with lead partners for the relevant HAP in order to review progress and identify whether additional or different activities are considered necessary. These interviews focused largely on marine, freshwater and coastal habitats. Interviews were conducted for eutrophic standing waters, chalk rivers, machair; vegetated shingle; maritime cliff and slope; sand dunes; saltmarsh; mudflats; saline lagoons; and marine habitats (Annex 1).

Table 2.1 summarises the changes that have been made to the costings for each individual HAP.

**Table 2.1: HAP Costings: Updates and Changes for each HAP**

|  |  |
| --- | --- |
| **HAP / group of HAPs** | **Update from previous costing of HAP** |
| Wood pasture and parkland | Targets unchanged  AES payments updated  Capital costs of restoration adjusted for inflation  Capital costs of expansion updated by relevant AES payments |
| Native woodland  (7 HAPs) | Targets updated  AES and woodland scheme payments updated  Capital costs of restoration adjusted for inflation  Capital costs of expansion updated by relevant AES and woodland scheme payments |
| Lowland heathland | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Upland heathland | Targets updated  AES payments updated  Capital costs of restoration adjusted for inflation |
| Blanket bog | Targets updated  AES payments updated  Capital costs of restoration adjusted for inflation |
| Lowland raised bog | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Coastal and floodplain grazing marsh | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Purple moor grass and rush pasture | Targets unchanged  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Lowland calcareous grassland | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Lowland dry acid grassland | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Upland calcareous grassland | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Upland hay meadow | Targets unchanged  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Lowland meadow | Targets unchanged  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Hedgerows | Targets unchanged  AES payments updated |
| Arable field margins | Targets unchanged  AES payments updated |
| Limestone pavement | Targets updated  AES payments updated  Capital costs of restoration adjusted for inflation |
| Fens | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Reedbeds | Targets updated  AES payments updated  Capital costs of restoration and expansion adjusted for inflation |
| Aquifer fed naturally fluctuating water bodies | Targets unchanged  Annual costs estimates adjusted to account for two new sites in Northern Ireland  Unit costs adjusted for inflation |
| Eutrophic standing waters | Targets unchanged  Costed activities verified with lead partner  Unit costs adjusted for inflation |
| Mesotrophic lakes | Targets unchanged  Unit costs adjusted for inflation |
| Chalk rivers | Targets unchanged  Costed activities updated in consultation with lead partner  Unit costs adjusted for inflation |
| Machair | Targets unchanged  Costed activities verified with lead partner  AES payments updated  Unit costs updated for inflation |
| Coastal vegetated shingle | Maintenance costs updated for inflation  Unit costs updated in consultation with lead partner |
| Maritime cliff and slope | Targets updated  Costed activities verified with lead partner  AES payments updated  Unit costs adjusted for inflation |
| Sand dunes | Targets updated  Costed activities verified with lead partner  AES payments updated  Capital costs of restoration and expansion adjusted for inflation  Unit costs adjusted for inflation |
| Saltmarsh | Targets unchanged  Capital costs of expansion updated in consultation with lead partner |
| Mudflats | Targets unchanged  Capital costs of expansion updated in consultation with lead partner  Unit costs adjusted for inflation |
| Saline lagoons | Targets unchanged  Costed activities verified with lead partner  Maintenance costs adjusted for inflation  Capital costs of restoration and expansion adjusted for inflation  Unit costs adjusted for inflation |
| Marine habitats  (12 HAPs) | Targets unchanged  Costed activities verified with lead partner  Unit costs adjusted for inflation  Additional costs adjusted for inflation |

For many HAPs there has been progress towards reaching targets, either because of more research and survey work, increased guidance and awareness or improved management regimes and new coordinating bodies. For coastal HAPs there has been a general move towards a more integrated approach to habitat management that recognises the connectivity of habitats. Focus has shifted to a wider coastal management approach assuming that managing the coastline in a sympathetic manner will provide benefits across habitats as well as more cost effective management.

The interviews largely confirmed the core activities involved in the previous costing of HAPs where costs are based on a set of activities considered necessary to reach the HAP targets. However, in some cases the cost of these activities has changed, either because the extent of the activity itself has changed or because a more recent estimate has been established. The largest changes in HAP costings have occurred in coastal vegetated shingle, mudflats and saltmarsh.

For coastal vegetated shingle comprehensive surveys have been carried out and a new dune and shingle network has been set up. A series of pilot sites on key shingle areas have been established to illustrate good practice and standards for mapping and surveying. Such progress means that a national HAP co-ordinator is no longer needed exclusively for this HAP and the cost of updating the advisory handbook would focus mainly on updating the relevant case studies which would bring down costs further.

For mudflats and saltmarsh the basic activities relating to research and coordination still need funding although new initiatives, such as surveys and online guidance, have been implemented since the previous costing. The change in cost for these habitats is associated with a new Environment Agency estimate of the cost for creating new habitats. This has risen from £15,000 to £50,000 and accounts for land purchase costs, modelling costs and planning application costs.

As before, the HAP costings may be conservative because they:

1. Are based on current payment rates for agri-environment and land management schemes. This provides the most realistic basis for costing HAP land management activities. However, it should be noted that current prescriptions may be insufficient to achieve habitat outcomes (i.e. favourable condition) and that higher costs may need to be incurred to achieve this. Furthermore, current payment rates may not always be high enough to achieve the desired levels of uptake of schemes.
2. Focus on unit costs of habitat management and may exclude some fixed costs associated with multi-objective delivery. For example, terrestrial HAPs are costed using agri-environment payment rates, and exclude additional measures such as farm management plans that meet multiple objectives but may facilitate the delivery of the HAP.

## SAP Costings – Individual Species

The previous costings exercise involved interviews with lead partners to estimate the costs of delivering a sample of SAPs. The interviews established the key actions deemed to be necessary to deliver the SAP targets, and the resources required to deliver them. They focused on action for individual species, and excluded the costs of delivering habitat change at the landscape scale that would benefit a variety of species (see section 2.4). Extrapolation from the sample enabled the costs of delivering all of the SAPs (which numbered 391 at the time) to be estimated.

The cost of delivering these 391 SAPs was estimated at £21.8 million per annum between 2006 and 2010. This total was low compared to the estimates for HAPs and action for widespread species. Details are given in the 2006 report on SAP costings[[3]](#footnote-3).

In order to facilitate future cost estimates, the earlier work estimated the average costs of delivering individual SAPs for plants, vertebrates and invertebrates (Table 2.2). It was proposed that these average costs could be used to estimate the costs of new SAPs as they were developed.

**Table 2.2: Average Annual Costs of Delivering Individual SAPs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average cost per plan (2006 to 2010, £k)** | **Number of plans, 2006 costings** | **Estimated cost, 2006 costings (£k)** | **Average cost at 2009 prices (£k)** |
| Vertebrates | 206.1 | 55 | 11,338 | 227.8 |
| Invertebrates | 39.0 | 172 | 6,709 | 43.1 |
| Plants | 23.2 | 164 | 3,801 | 25.6 |
| All SAPs | **55.9** | **391** | **21,847** |  |

When the previous costings were undertaken, the priority species list numbered 577, which were covered by a combination of species action plans, grouped species action plans (covering various species of marine mammals, sea fish, invertebrates and plants) and species statements.

Since 2006, the priority species list has been approximately doubled in length to include 1149 species, with some species removed and many more added. Actions to further the conservation of the new species have been proposed[[4]](#footnote-4).

In order to update the individual species cost estimates, we have applied the previously estimated average costs per plan for each group, updating them to 2009 prices (Table 2.2). We have assumed that annual costs in the 2010 to 2020 period are similar to those in the 2006 to 2010 period, on the assumption that the level of activity required per plan will remain broadly constant.

A complicating factor is that the previous costings estimated the costs of delivering 391 species action plans, while the priority species list covered 577 species, many of which did not have individual plans but were dealt with through grouped plans or species statements. Therefore the number of SAPs was just more than two thirds (68%) of the number of priority species. Because many of the new species are also likely to be addressed through grouped actions in this way, it would be misleading to apply the previous cost estimates to the new priority list of 1149 species. This issue has been addressed by applying a similar scaling factor of 0.68 to the species list in order to estimate the number of plans requiring action on a comparable basis to the previous estimate.

While these are significant assumptions, they need to be seen in the context of the relatively small scale of the individual SAP costings estimates (which at £22m accounted for only 3% of the estimated costs of delivering the UKBAP between 2006 and 2010) and the substantial effort that would be required to revise them in detail.

## SAP Costings – Widespread Species

The earlier costings included the development of an ecological model to estimate the cost of habitat provision at the landscape scale for species of the wider countryside. Further details are given by RPS (2006)[[5]](#footnote-5).

The widespread species cost estimates were updated as part of the current study. The objectives of this update were:

1. To update and rerun the widespread species cost model to reflect species targets for 2015 and 2020. Previous estimates were for 2010 only.

2. To update the costs to reflect any changes in areas of habitat required, as well as any changes in per hectare payment rates.

3. To provide updated estimates of the costs of widespread species SAP delivery in each year from 2010 - 2015, and 2015 - 2020, at 2009 prices.

The six step method that was used in the earlier study was again applied. Consideration was given to developments and changes that had occurred since the earlier study that would need to be accounted for in the estimation of the costs for the two five year periods to 2020. The changes and developments that were identified and how they are addressed in this study were:

* New species have been added to the UK BAP list. There was the potential need to consider those new species against the criteria developed in the earlier study to identify if they qualified as wider countryside species. Such species that would qualify as wider countryside species include, taking bird species as examples, Lapwing, Marsh Tit, Yellowhammer and Starling. These and similar species could have been added in to the modelling process. However, these new species have yet to be given quantitative targets and, in the absence of those targets, it is not possible to include them in the modelling process.
* Species have been removed from the UK BAP list. Though 123 species have been removed from the list, the 10 wider countryside bird species that formed the basis for the model remain on the list, so the widespread species costings are not affected.
* Species that continue to be on the UK BAP list and have new targets. Those species that continued on the UK BAP list were given new targets in 2006 that extended from 2010 to 2020. Listed in Table 1 of Annex 2 are the targets for the suite of 10 wider countryside birds that is used in the modelling process that provides the basis for the wider countryside SAP costing.
* Current trends in populations. The populations of the species used in the modelling process are subject to ongoing changes in their population that result from a combination of factors, including land use change, climate change and the current application of land management measures through agri-environment schemes. It is against these background trends in populations that additional measures are identified and costed in the modelling process to achieve the SAP targets. In the earlier costing exercise such background population trends were applied. Those background trends have been updated for the costing for the period 2010-2020. Five year trends for the suite of ten wider countryside species are presented in Table 2 of Annex 2, and range from -45% for turtle dove to +25% for reed bunting. These trends, expressed as an annual change figure, were included in the modelling of the populations of the wider countryside birds in response to scenarios of agri-environment scheme uptake.
* Advances in knowledge about species’ response to habitat management. A literature review was carried out to identify if there had been significant advances in knowledge about how species respond to land use and habitat management. This review did not identify a need to change the basic model used in the estimation of bird response to agri-environment scheme uptake.
* Changes in agri-environment scheme payment rates. Revisions were made to the costs of scheme uptake used in the modelling process, in line with revisions made in the HAP costings work.

Further details of the methodology employed to update the widespread species cost estimates are given in Annex 2.

## BAP Expenditures

### Overall approach

As with the previous costings (GHK, 2006, 2007)[[6]](#footnote-6), we have collected data on expenditures contributing to the UKBAP in different countries, in order to enable comparisons to be made between estimated costs and overall levels of current expenditure.

The following steps were taken to estimate current BAP-related expenditures in the UK:

1. The organisations and initiatives identified by the previous study as being involved in funding biodiversity conservation in the different countries of the UK were contacted again;
2. Some changes had taken place, since the earlier study, to organisations, initiatives and personnel, so the original list of funding streams and contacts was amended accordingly;
3. In consultation with the organisations and initiatives concerned, information on current biodiversity-related expenditures was obtained under the various schemes and by different organisations, across England, Scotland, Wales and Northern Ireland;
4. Where it was not possible to obtain a figure for expenditure directly related to the BAP, a relevant proportion of the overall biodiversity-related expenditure that is contributing specifically to the delivery of the BAP was estimated;
5. Separate estimates were then obtained, wherever possible, for future BAP related expenditure in the year 2010/11, along with reasons for any expected change;
6. Where it was not possible to obtain the necessary information directly from the relevant organisations:

* A web search was undertaken in order to compile published evidence of current expenditure and, where available, evidence of expected future changes to the level of expenditure. Sources included annual reports, and financial information found on respective websites.
* Reference was made to figures previously compiled by Defra on UK public sector expenditures on biodiversity. These estimates related to overall biodiversity expenditures, rather than those specifically on the UK BAP. These were compared to figures sourced elsewhere. If other sources were unavailable, the figures compiled by Defra were used, with the assumption that 50% of biodiversity related expenditures could be attributed to UK BAP priorities.
* If none of the above information was available, the expenditure levels of the previous study have been assumed to continue to the year 2010/11.

1. Where only aggregate figures were available for the whole of the UK, estimates were made of expenditure at the country level by disaggregating expenditure as necessary (either through best estimates, or by landmass);

All estimates are expressed in 2009 prices.

Some of the key methodological issues that had to be addressed in this process are discussed in the following sections.

### Identifying BAP Expenditures

The analysis attempts to identify current and future expenditures that contribute to the delivery of species and habitat action plans under the UK BAP. In practice, many organisations provided data relating to programmes or budgets with wider environmental, landscape or rural development objectives, so it was necessary to identify what proportion of these expenditures was BAP related. Also important is the distinction between biodiversity related and BAP related expenditures, since not all spending on biodiversity conservation contributes directly to the UK BAP. For example, some national expenditure by statutory agencies on policy, educational and research activities may be designed to benefit biodiversity as a whole but does not necessarily contribute to the delivery of HAPs and SAPs. Some expenditure on habitat management may produce direct biodiversity benefits without contributing to BAP targets, where it focuses on non-priority habitats such as coniferous woodland or improved grassland without benefiting priority species.

In order to estimate current and future BAP related expenditure, it has therefore been necessary to identify that proportion of the relevant budgets that is likely to be attributable to BAP species and BAP habitats. The major issue remains the limited availability of reliable data on BAP related expenditure and the ability of the organisations to distinguish between general biodiversity expenditure and BAP-related expenditure. In many cases information systems could not enable this segregation and so an informed view of key individuals within each organisation was the best possible estimate.

In the absence of feedback from the relevant organisations, GHK estimated the proportion of expenditure that is BAP-related, based on information provided by similar organisations in the other countries. Where organisations were unable to respond within the project’s timetable, previously collected estimates of expenditure were used as the next best available figures.

### Agri-environment schemes

Much of the expenditure attributed to the UKBAP is from agri-environment schemes. Comprehensive information on open and closed agri-environment schemes in England, and the options under each, was provided by Defra. For Entry Level Stewardship, for which eligibility for payments depends on the award of points for uptake of different options, the annual expenditure per option was calculated on the basis of points awarded for each option. This was done by calculating the proportion of total points allocated to each option in each year, and then multiplying that by total annual expenditure to estimate “spend per option”.

It was then determined which options were likely to contribute towards the UKBAP, and of these, what proportion of each was likely to contribute to the delivery of HAPs or SAPs. Attributing expenditures to HAPs involved identification of options that correspond with priority habitats; for SAPs, the likelihood of benefits for priority species (including widespread species) was assessed. Because the widespread species costings are based on estimates of the area of habitat requiring broadly sympathetic management at the landscape scale, a relatively inclusive approach to allocation of agri-environment expenditures was taken, incorporating a wide variety of arable and grassland options, other habitats and farmland features.

Allocation of ELS and HLS options to HAPs was also informed by data provided by Natural England on the physical coverage of agri-environment schemes of different HAPs. A percentage of relevant capital items and supplements in proportion to the percentage of other BAP-related spend was also included.

As a result of these methodological refinements, as well as increased agri-environment expenditures, the estimated BAP-related spend in England from agri-environment schemes has increased since the last update.

For Wales, the Welsh Assembly was unable to respond within the project's timetable. Instead, data was sourced online[[7]](#footnote-7) on 2009 expenditure under Tir Gofal (£9.8 million) and Tir Cynnal (£8.2 million). This was considered to be a good estimate given the total (£18.5 million) was close to the figure provided to Defra by the Welsh Assembly on expenditure on biodiversity (£18.35 million). The proportion used in the last update, of expenditure related to the UKBAP, was still thought to be the best estimate (59%).

The Scottish Executive was also unable to respond within the project's timetable. Figures on relevant expenditure were instead taken from annual report of the Rural Payments and Inspections Directorate[[8]](#footnote-8) totalling £22.2 million, which again compared closely to that provided to Defra on biodiversity expenditure (£20.7 million).

DARDNI was able to provide actual data on biodiversity related expenditure in Northern Ireland. It thought that 50% of this figure contributed towards the UKBAP.

### Estimating Future BAP Expenditures

There are inevitable difficulties with estimating future expenditure, particularly given the complexities of estimating current levels of BAP-related expenditure. Many organisations stated that the task of forecasting future expenditure levels was particularly difficult because of uncertainty over future priorities, targets, and budgets, especially given possible changes in government.

### Estimating Country Level Costs

While some organisations such as the statutory nature conservation agencies and agriculture departments focus their expenditures on individual countries, others such as the Forestry Commission, Heritage Lottery Fund, the Big Lottery, Wildlife and Countryside Link Organisations, Landfill Communities Fund, Environment Agency, Ministry of Defence, and [Natural Environment Research Council](http://www.nerc.ac.uk/) spend money in more than one country. Where data has permitted, the expenditure has been split to accurately reflect actual expenditure in each country. Where this was not possible the organisations were asked to provide their best estimate. If this was still not possible the UK expenditure was split between the four UK countries relative to their land mass.

### Avoiding Double Counting

Double counting is a significant issue in relation to some of the funding programmes. For example, the biodiversity work of voluntary sector organisations such as the RSPB and Wildlife Trusts benefits from significant funding from agri-environment programmes, the Heritage Lottery Fund, Landfill Communities Fund and other sources. There is therefore a risk that recording expenditures under all of these organisations and programmes will double count some expenditure. Care has therefore been taken to avoid double counting in producing the expenditure estimates.

Sections 3-6 present updated estimates of costs and expenditures relating to delivery of the UKBAP.

# hap costings

The total annual cost of delivering the UK Habitat Action Plans is estimated at £516 million between 2010 and 2015, falling to £477 million between 2015 and 2020 (Table 3.1). The main reason for the decrease in costs is that no target has been set for restoration of blanket bog after 2015.

**Table 3.1: Updated Cost Estimates of Habitat Action Plans, and Comparison to Previous Estimates (£000)\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2010 to 2015** | | **2015 to 2020** | |
| **Previous** | **Update** | **Previous** | **Update** |
| Wood Pasture and Parkland | 6,693 | **6,834** | 7,982 | **8,178** |
| Native Woodlands | 73,631 | **108,013** | 78,442 | **115,861** |
| Lowland Heathland | 17,747 | **13,793** | 20,180 | **14,444** |
| Upland Heath | 17,148 | **27,142** | 16,254 | **24,095** |
| Blanket Bog | 59,949 | **64,349** | 59,949 | **21,789** |
| Lowland Raised Bogs | 2,388 | **2,521** | 3,500 | **3,721** |
| Coastal and Floodplain Grazing Marsh | 49,750 | **50,644** | 51,475 | **53,260** |
| Purple Moor Grass and Rush Pastures | 8,927 | **10,316** | 10,180 | **12,029** |
| Lowland Calcareous Grassland | 10,786 | **10,784** | 9,848 | **9,843** |
| Lowland Dry Acid Grassland | 5,336 | **5,275** | 5,803 | **5,744** |
| Upland Calcareous Grassland | 2,309 | **2,618** | 2,320 | **2,651** |
| Upland Hay Meadows | 244 | **245** | 242 | **242** |
| Lowland Meadows | 1,962 | **2,000** | 2,129 | **2,178** |
| Hedgerows | 72,279 | **103,576** | 72,541 | **111,074** |
| Arable Field Margins | 32,021 | **35,569** | 33,418 | **37,033** |
| Limestone Pavements | 545 | **562** | 545 | **562** |
| Fens | 1,209 | **1,114** | 1,530 | **1,431** |
| Reedbed | 1,707 | **1,767** | 1,718 | **1,861** |
| Aquifer Fed Naturally Fluctuating Water Bodies | 17 | **21** | 8 | **11** |
| Eutrophic Standing Waters | 1,590 | **1,727** | 1,570 | **1,705** |
| Mesotrophic Lakes | 1,372 | **1,490** | 1,362 | **1,479** |
| Chalk Rivers | 1,394 | **1,405** | 1,250 | **1,249** |
| Machair | 1,479 | **1,479** | 1,438 | **1,438** |
| Vegetated Shingle | 636 | **623** | 636 | **623** |
| Maritime Cliff and Slope | 2,522 | **2,536** | 2,520 | **2,533** |
| Sand Dunes | 2,913 | **2,986** | 2,913 | **2,986** |
| Saltmarsh | 3,423 | **14,786** | 2,793 | **12,686** |
| Mudflats | 10,524 | **35,026** | 7,524 | **25,026** |
| Saline Lagoons | 510 | **553** | 373 | **405** |
| Marine Habitats (12 HAPs) | 5,912 | **6,420** | 912 | **990** |
|  | 396,924 | **516,174** | 401,354 | **477,130** |

\* *Previous estimates in 2005 prices; updated estimates in 2009 prices*

This is an increase from the previous estimates, which were £397 million in 2010-15 and £401 million between 2015 and 2020. Adjusting the previous estimates for general price increases indicates that there has been a significant increase in the cost of reaching HAP targets in real terms in both periods (Table 3.2).

**Table 3.2: Total Costs of HAP Delivery: Comparison with Previous Cost Estimates (£000)**

|  |  |  |
| --- | --- | --- |
|  | **2010 to 2015** | **2015 to 2020** |
| Previous estimate (2005 prices) | 396,924 | 401,354 |
| Previous estimate (inflated to 2009 prices)\* | 438,111 | 444,000 |
| New estimate | 516,174 | 477,130 |

*\*Adjusted using HM Treasury GDP Deflator*

The main cost increases relate to:

* Native woodlands
* Upland Heath
* Hedgerows
* Saltmarsh
* Mudflats.

Together the estimated costs of delivery of these five HAPs have increased by £111 million annually, accounting for the entire increase in the estimated cost of HAP delivery. The combined costs of the remaining HAPs have therefore declined in real terms over the period.

The estimated cost increases for these habitats result from:

* An increase in HAP targets for native woodlands and upland heath;
* An increase in agri-environment payment rates for hedgerows;
* A large increase in the estimated unit cost of creating intertidal habitats. The Environment Agency estimates mudflat and saltmarsh creation at £50,000/ha compared to an earlier estimate of £15,000/ha. This alone adds another £35.8 million for these two HAPs.

As with the previous costings, the costs are concentrated among a few expensive HAPs. Native woodlands, blanket bog, hedgerows, coastal and floodplain grazing marsh and arable field margins together cost an estimated £362 million between 2010 and 2015, accounting for 70% of the total cost (Table 3.3). In the previous cost estimates, the same 5 HAPs also had the highest cost estimates and accounted for 70% of the estimated total HAP costs. However, the estimated costs of delivering the HAPs for mudflats and upland heath have increased and are now almost as high as those for arable field margins.

Including mudflats and upland heath, the seven most expensive HAPs account for 83% of the total revised cost estimate.

**Table 3.3: Combined Annual Costs of Five Most Expensive HAPs**

|  |  |  |
| --- | --- | --- |
|  | **2010 to 2015** | **2015 to 2020** |
| Combined cost (£k) of five most expensive HAPs | 362,151 | 342,254 |
| % of overall cost | 70% | 72% |

The largest costs are in England, accounting for 67% of the annual total between 2010 and 2015, followed by Scotland (20%), Wales (9%) and Northern Ireland (4%, Table 3.3). This is roughly similar to the previous period 2005-2010 when England accounted for 65%, Scotland 25%, Wales 7% and Northern Ireland 3%. The proportion of the cost occurring in England is estimated at 74% in the 2015 to 2020 period.

**Table 3.4: Estimated Costs by Country for Delivery of all HAPs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2010 to 2015** | | **2015 to 2020** | |
|  | **Previous** | **Update** | **Previous** | **Update** |
| England | 276,104 | 345,495 | 280,474 | 353,634 |
| Northern Ireland | 14,147 | 20,605 | 14,562 | 18,113 |
| Scotland | 73,005 | 104,781 | 71,059 | 59,052 |
| Wales | 33,668 | 45,293 | 35,260 | 46,330 |
| UK | 396,924 | **516,174** | 401,354 | **477,130** |

# Sap Costings – Individual Species

Applying the method described in Section 2.3 above, we estimate that the cost of implementing Species Action Plans for the new priority species list at £47 million per annum (Table 4.1).

This increase is a result of:

* An increase in the number of priority species (which has approximately doubled);
* The effects of general price inflation.

The unit costs of SAP delivery are assumed to remain the same as before.

The new estimate is roughly twice as high in real terms as the previous estimate of £21.8 million (2005 prices, equivalent to £24 million at 2009 prices).

**Table 4.1: Revised SAP Costs Estimate – Individual Species**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Previous estimate (2005 prices, £k)** | **Revised estimate (2009 prices, £k)** | **% of revised total** |
| Vertebrates | 11,338 | 25,012 | 53% |
| Invertebrates | 6,709 | 12,620 | 27% |
| Plants | 3,801 | 9,634 | 20% |
| **All SAPs** | **21,847** | **47,267** | **100%** |

It is estimated that vertebrates account for just more than half of the revised total (53%), with invertebrates accounting for 27% and plants 20%.

An estimated breakdown of these costs by country is given in Table 4.2. As in the previous estimates, costs are assumed to be proportionate to land area.

**Table 4.2: Estimated Breakdown of Individual SAP Costs per Country**

|  |  |  |
| --- | --- | --- |
| **Country** | **Estimated Annual Costs (£k)** | **Percentage of Total** |
| England | 30,534 | 65% |
| Northern Ireland | 1,513 | 3% |
| Scotland | 11,580 | 25% |
| Wales | 3,640 | 8% |
| **UK** | **47,267** | **100%** |

These estimates refer to the costs of actions for individual species only. Delivery of many of the SAP targets depends on sympathetic habitat management for widespread species at the landscape scale, the costs of which are estimated in the next section.

Despite the estimated increase, the costs of action for individual species remain low compared to those for habitats and widespread species.

# Sap costings – Widespread species

The UK wide total annual cost to achieve the SAP targets for widespread countryside species over the two five year periods 2011 – 2015 and 2016 – 2020 was modelled to be £293 million per year. This is based on the costs for achieving the UK BAP targets for a suite of 10 birds occurring in the wider countryside.

To attain these targets, within each 1,000 ha landscape unit, the uptake of agri-environment schemes was modelled to provide in each of the five year periods additional habitat and land management through:

* 375 ha in ‘Entry’ level schemes
* 65 ha in ‘Higher’ level schemes
* 40 ha in woodland management schemes

This additional habitat and land management needs to be targeted at the lowlands of the UK, reflecting the distribution of the suite of wider countryside birds and the widespread species.

This predicted cost of £293 million per year compares to the estimate of £353 million per year made in the earlier study for the five year period up to 2006 – 2010 for the same suite of wider countryside birds.

The previous costing exercise underwent a process of accounting for habitat action that will benefit wider countryside species that were not used in the modelling. In the previous exercise this did not add any significant costs. It is likely that delivering the wider countryside SAPs to 2020 will require significant additional costs to be estimated. This is considered to be the case because the new SAPs include a number of freshwater species, including migratory fish, of widespread occurrence. The uptake of agri-environment schemes modelled above will provide benefit to these species through a likely reduction in diffuse water pollution and the creation and management of riparian habitat. Those agri-environment schemes will not though provide the channel restoration works that would benefit many species and not provide the removal of structures that are an obstruction to migratory fish passage. These actions would need additional costing.

The previous costing exercise also underwent a process of removing any habitat costs that had been, in effect, ‘double-counted’ between the costs produced for the HAPs and the habitat creation for the wider countryside species. If similar adjustments (in the order of £19 million/yr) are appropriate for the wider countryside SAPs over the period 2010 to 2020 then the adjusted cost of achieving those targets is in the order of £274 million per year.

Based on this estimate, the revised cost estimates are given in Table 5.1.

**Table 5.1: Estimated breakdown of widespread species costs by country, 2011-2020, in addition to HAP costs**

|  |  |
| --- | --- |
| **Area** | **Additional Cost 2011-2020 (£m/yr)** |
| England | 197 |
| Northern Ireland | 15 |
| Scotland | 45 |
| Wales | 17 |
| **UK total** | **274** |

# BAP funding

Current annual expenditure contributing to the delivery of the UK BAP is estimated at £568 million (Table 6.1). By comparison GHK’s last estimate (made in 2007) was that UK BAP expenditures totalled £467 million in 2006. The increase is a result of significant increases in agri-environment expenditures, as well as general price inflation.

A slight decrease is expected in the future, with expenditure estimated in 2010/11 at £564 million. The current estimates indicate that 74% of the total expenditure is judged to contribute to HAPs, with 26% contributing towards SAPs. The proportion of expenditure judged to benefit SAPs has increased compared to the previous estimate of 19%. This reflects an increase in “entry-level” agri-environment expenditures which are judged to benefit widespread species.

**Table 6.1: Overview of estimated BAP expenditure in the UK**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **2008/09** | **2010/11** | **% change** |
| **England** | **BAP-related expenditure** | **406.9** | **399.9** | **-2%** |
| Of which HAP | 275.7 | 270.1 | -2% |
| Of which SAP | 131.2 | 129.8 | -1% |
| **Scotland** | **BAP-related expenditure** | **92.5** | **97.1** | **5%** |
| Of which HAP | 82.4 | 86.6 | 5% |
| Of which SAP | 10.1 | 10.5 | 4% |
| **Wales** | **BAP-related expenditure** | **46.3** | **43.3** | **-6%** |
| Of which HAP | 41.1 | 38.3 | -7% |
| Of which SAP | 05.2 | 5.1 | -2% |
| **Northern Ireland** | **BAP-related expenditure** | **22.6** | **23.8** | **5%** |
| Of which HAP | 19.2 | 20.3 | 6% |
| Of which SAP | 3.3 | 3.5 | 4% |
| **UK TOTAL** | **BAP-related expenditure** | **568.3** | **564.0** | **-1%** |
| Of which HAP | 418.5 | 415.3 | -1% |
| Of which SAP | 149.8 | 148.8 | -1% |

The estimates for 2010/11 indicate that the largest expenditures are in England, accounting for 71% of the total. This proportion has increased since the previous estimates. Scotland accounts for 17% of estimated UK BAP expenditure, Wales for 8% and Northern Ireland 4% (Table 6.2).

**Table 6.2: Proportion of BAP expenditure in each country**

|  |  |  |
| --- | --- | --- |
|  | **2008/09** | **2010/11** |
| England | 72% | 71% |
| Scotland | 16% | 17% |
| Wales | 8% | 8% |
| Northern Ireland | 4% | 4% |
| **UK (£ million )** | **568.3** | **564.0** |

The figures also suggest that there are significant variations between the UK countries in the breakdown of expenditure by organisation and programme. These reflect variations in land use and management, as well as in the funding schemes themselves.

The main contributor towards spending on the UKBAP in England is the agri-environment programme, accounting for 65% of expenditure. Wildlife and Countryside Link Organisations and the Forestry Commission each account for just less than 10% of total expenditure. Other expenditures by Natural England and the Environment Agency are the other significant contributors, each accounting for about 6% of BAP spending.

In Scotland, the largest proportion of spending is by the Forestry Commission, at 39%, followed by Wildlife and Countryside Link Organisations (25%) and the Scottish Executive agri-environment schemes (19%). The other significant contribution is that of Scottish Natural Heritage, at 11%.

In Wales, as in Scotland, the Forestry Commission is the most significant contributor (42%), followed by the agri-environment programme. The Countryside Council for Wales contributes a further 17%, with Wildlife and Countryside Link Organisations accounting for a further 13% of the BAP expenditure.

In Northern Ireland, the situation more closely resembles that of England, with agri-environment schemes accounting for the bulk of BAP expenditure (55%). The other significant contributors are the Environment and Heritage Service (20%), and Wildlife and Countryside Link Organisations (19%).

The Annexes provide further detail about expenditure by different organisations and programmes.

# Summary and Conclusions

## Total Costs of Delivering the UKBAP

The total costs of delivering the UK Biodiversity Action Plan are estimated at £837 million per year between 2010 and 2015, declining slightly to £798 million annually between 2015 and 2020.

HAPs account for more than 60%, and action for widespread species an additional third of the overall cost estimates. Despite a significant increase on previous estimates, the costs of action for individual species are estimated at only 6% of the total (Table 7.1).

**Table 7.1: Estimated Costs of UK BAP Delivery, by Category**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2010 to 2015** | | **2015 to 2020** | |
|  | **£m** | **Percent** | **£m** | **Percent** |
| Habitat Action Plans | 516 | 62% | 477 | 60% |
| Individual Species Action Plans | 47 | 6% | 47 | 6% |
| Action for Widespread Species | 274 | 33% | 274 | 34% |
| **Total** | **837** | **100%** | **798** | **100%** |

The largest costs occur in England, at roughly 70% of the total (Table 7.2). Scotland’s share declines between 2015 and 2020 largely as a result of a forecast decline in the costs of particular HAPs, especially blanket bog.

**Table 7.2: Estimated Costs of UK BAP Delivery, by Country**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2010 to 2015** | | **2015 to 2020** | |
|  | **£m** | **Percent** | **£m** | **Percent** |
| England | 573 | 68% | 581 | 73% |
| Northern Ireland | 37 | 4% | 35 | 4% |
| Scotland | 161 | 19% | 116 | 14% |
| Wales | 66 | 8% | 67 | 8% |
| **UK** | **837** | **100%** | **798** | **100%** |

## Comparison of Costs and Expenditures

The estimated costs of delivering the UK BAP of £837 million per annum between 2010 and 2015 compare with estimates of current expenditures on UK BAP action of £564 million per year in 2010/11.

This suggests a current shortfall of £273 million in annual expenditure required to meet BAP priorities. The figures suggest that expenditures for both species and habitats are less than those required to meet BAP priorities in each of the UK countries.

It should also be noted that the estimates of expenditures contributing to BAP priorities and estimates of BAP related costs are aggregates, and do not take account of the allocation of funding to particular priorities. It is likely that the aggregate figures conceal instances where current expenditures are well short of those needed, while in other cases current spending may be sufficient to meet priorities.

**Table 7.3: Comparison of BAP Costs and Current Expenditures (£m per annum)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **England** | **Northern Ireland** | **Scotland** | **Wales** | **UK** |
| **Estimated Costs, 2010 to 2015** |  |  |  |  |  |
| Habitat Action Plans | 346 | 21 | 105 | 45 | **516** |
| *Individual Species Action Plans* | *31* | *2* | *12* | *4* | ***47*** |
| *Action for Widespread Species* | *197* | *15* | *45* | *17* | ***274*** |
| Species Action Plans | 228 | 17 | 57 | 21 | **321** |
| **UK BAP Costs** | **573** | **37** | **161** | **66** | **837** |
| **Estimated Expenditures, 2010/11** |  |  |  |  |  |
| HAP Expenditures | 270 | 20 | 87 | 38 | **415** |
| SAP Expenditures | 130 | 5 | 11 | 4 | **149** |
| **UK BAP Expenditures** | **400** | **25** | **97** | **42** | **564** |
| Estimated Shortfall | 173 | 12 | 64 | 24 | **273** |

Table 7.4 compares the estimated funding gap (for the 2010 to 2015 period) with that estimated in the previous cost estimates (for the 2005 to 2010 period). The estimated annual cost of delivering the UK BAP has increased from £677 million to £837 million, with BAP related expenditures increasing from £339 million to £564 million per annum. The increase in expenditure has been greater than the estimated increase in costs, resulting a decline in the annual funding shortfall from £338 million to £273 million (at 2009 prices).

**Table 7.4: Comparison with Previous Cost and Expenditure Estimates**

|  |  |  |
| --- | --- | --- |
|  | **Revised Estimates, 2010-2015, UK, 2009 Prices** | **Previous Estimates, 2005 to 2010, UK, 2005 Prices** |
| **Estimated Costs, 2010 to 2015** |  |  |
| Habitat Action Plans | **516** | **321** |
| *Individual Species Action Plans* | ***47*** | ***22*** |
| *Action for Widespread Species* | ***274*** | ***334*** |
| Species Action Plans | **321** | ***356*** |
| **UK BAP Costs** | **837** | **677** |
| **Estimated Expenditures, 2010/11** |  |  |
| HAP Expenditures | **415** | **294** |
| SAP Expenditures | **149** | **45** |
| **UK BAP Expenditures** | **564** | **339** |
| Estimated Shortfall | **273** | **338** |

# Annex 1: Consultees for hap costings

The consultants are grateful to the following consultees for assistance with the HAP costings update.

|  |  |  |
| --- | --- | --- |
| Eutrophic standing waters | Simon Leaf | Environment Agency |
| Chalk rivers | Lawrence Talks | Environment Agency |
| Maritime cliff and slopes | Dr Peter Rhind | Countryside Council for Wales |
| Coastal sand dunes | Stewart Angus | Scottish Natural Heritage |
| Coastal vegetated shingle | Sue Rees | Natural England |
| Coastal saltmarsh | Amy Parrot | Environment Agency |
| Mudflats | Amy Parrot | Environment Agency |
| Saline lagoons | Ian Reach | Natural England |
| Machair | Janet Khan | Scottish Environment Protection Agency |
| Marine habitats | Janet Khan | Scottish Environment Protection Agency |

We are also grateful to the numerous organisations and individuals who provided updated data on BAP related expenditures.

# Annex 2: Widespread Species Costs

UK Biodiversity Action Plan

Costing Habitat Action for Widespread Countryside Species: 2010 - 2020

Final Report

Report by RPS Planning & Development Ltd

*in association with*

*GHK Consulting Ltd*

*March 2010*

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| *Prepared by* | *Roger Buisson, RPS* |
| *Checked by* | *Matt Rayment* |

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# Summary

GHK Consulting Ltd and RPS Planning & Development Ltd were commissioned by Defra to update earlier work on the costs of delivering the UK Biodiversity Action Plan to provide costings for the period 2010 to 2020.

The component of the contract described in this report is the update of the work undertaken to provide an estimate for the cost of habitat provision at the landscape scale for species of the wider countryside. The objectives were:

1. To update and rerun the widespread species cost model to reflect species targets for 2015 and 2020.

2. To update the costs to reflect any changes in areas of habitat required, as well as any changes in per hectare payment rates.

3. To provide updated estimates of the costs of widespread species SAP delivery.

The UK wide total annual cost to achieve the SAP targets for widespread countryside species over the two five year periods 2011 – 2015 and 2016 – 2020 is predicted to be £293 million per year. This is based on the costs for achieving the UK BAP targets for a suite of 10 birds occurring in the wider countryside.

To attain these targets, within each 1,000 ha landscape unit, the uptake of agri-environment schemes was modelled to provide in each of the five year periods additional habitat and land management through:

* 375 ha in ‘Entry’ level schemes
* 65 ha in ‘Higher’ level schemes
* 40 ha in woodland management schemes

This additional habitat and land management needs to be targeted at the lowlands of the UK, reflecting the distribution of the suite of wider countryside birds and the widespread species.

The predicted cost of £293 million per year compares to the estimate of £353 million per year made in the earlier study for the five year period up to 2006 – 2010 for the same suite of wider countryside birds. After accounting for habitat action that will benefit wider countryside species that were not used in the modelling and the extent of ‘double-counting’ with the costs produced for the HAPs, an estimate of up to £334 million/yr was made for the wider countryside SAPs in the earlier costing. If similar adjustments are appropriate for the wider countryside SAPs over the period 2010 to 2020 then the cost of achieving those targets is in the order of £274 million per year.

# INTRODUCTION

GHK Consulting Ltd and RPS Planning & Development Ltd were commissioned by Defra to update earlier work on the costs of delivering the UK Biodiversity Action Plan (GHK, 2006) to provide costings for the period 2010 to 2020.

The component of the contract described in this report is the update of the work (RPS, 2006) undertaken to provide an estimate for the cost of habitat provision at the landscape scale for species of the wider countryside.

The objectives of update were:

1. To update and rerun the widespread species cost model to reflect species targets for 2015 and 2020. Previous estimates were for 2010 only.

2. To update the costs to reflect any changes in areas of habitat required, as well as any changes in per hectare payment rates.

3. To provide updated estimates of the costs of widespread species SAP delivery in each year from 2010 - 2015, and 2015 - 2020, at 2009 prices.

# METHODOLOGY

The six step method that was used in the earlier study was applied again in this updating work. Full details of that method can be found in RPS (2006).

Consideration was given to developments and changes that had occurred since the earlier study that would need to be accounted for in the estimation of the costs for the two five year periods to 2020. The changes and developments that were identified and how they are addressed in this study were:

* New species have been added to the UK BAP list.

There was the potential need to consider those new species against the criteria developed in the earlier study to identify if they qualified as wider countryside species. Such species that would qualify as wider countryside species include, taking bird species as examples, Lapwing, Marsh Tit, Yellowhammer and Starling. These and similar species could have been added in to the modelling process. However, these new species have yet to be given quantitative targets and, in the absence of those targets, it is not possible to include them in the modelling process.

* Species have been removed from the UK BAP list

If these were wider countryside species, account would have to be taken of this in the rerun of the costing. There were 123 species removed from the UK BAP list when it was reviewed (listed in Annex 2 of BRIG, 2007). Of the species identified as fitting the criteria of a wider countryside species in the earlier costing (that is present in more than 100 10km squares in the UK) there were three species that were removed from the UK BAP list: Pipistrelle Bat, Buttoned Snout and Killarney Fern. Since none of these species were used in the modelling of land use changes and biodiversity response that was the core of the costing process (it was limited to a list of 10 bird species) then their removal does not affect the modelling process. It should be noted that all of the wider countryside bird species that were used in the modelling have been retained on the UK BAP list.

* Species that continue to be on the UK BAP list and have new targets

Those species that continued on the UK BAP list were given new targets in 2006 that extended from 2010 to 2020. Listed below in Table 1 are the targets for the suite of 10 wider countryside birds that is used in the modelling process that provides the basis for the wider countryside SAP costing. The targets are expressed as an index derived from the BTO/JNCC/RSPB Breeding Bird Survey. The targets have been sourced from the relevant SAP, accessed through the BARS website (www.ukbap-reporting.org.uk/plans/targets). Where the target was expressed in words as a stable or positive trend in the BBS index this was taken as being an index of 100 for modelling purposes.

**Table 1: SAP targets to 2020 for the suite of wider countryside birds used in the modelling process.**

| **Species** | **2005** | **2010** | **2015** | **2020** |
| --- | --- | --- | --- | --- |
| Skylark | 100 | 100 | 115 | 130 |
| Linnet | 100 | 115 | 130 | 150 |
| Reed Bunting | 100 | 115 | 130 | 150 |
| Corn Bunting | 100 | 100 | 100 | 150 |
| Spotted Flycatcher | 100 | 100 | 100 | 115 |
| Tree Sparrow | 100 | 150 | 220 | 330 |
| Grey Partridge | n/a | 100 | 133 | 178 |
| Bullfinch | 100 | 100 | 100 | 115 |
| Turtle Dove | 100 | 100 | 100 | 115 |
| Song Thrush | 100 | 115 | 130 | 150 |

* Current trends in populations

The populations of the species used in the modelling process are subject to ongoing changes in their population that result from a combination of factors, including land use change, climate change and the current application of land management measures through agri-environment schemes. It is against these background trends in populations that additional measures are identified and costed in the modelling process to achieve the SAP targets. In the earlier costing exercise such backgrounds population trends were applied. Those background trends have been updated for the costing for the period 2010-2020. The most recent population trend data, expressed as a BBS population index, was accessed from the BTO website using the “Table Generator” (blx1.bto.org/misc/wcr/changeform2009). The most recent five year trend figure that this is able to produce is for the period 2003-07. The trends for the suite of ten wider countryside species are presented in Table 2. These trends, expressed as an annual change figure, were included in the modelling of the populations of the wider countryside birds in response to scenarios of agri-environment scheme uptake.

**Table 2: Trends in the populations of the suite of wider countryside birds over the period 2003-07.**

| **Species** | **BBS index change 2003-2007** |
| --- | --- |
| Skylark | -2 |
| Linnet | -19 |
| Reed Bunting | 25 |
| Corn Bunting | -1 |
| Spotted Flycatcher | -12 |
| Tree Sparrow | 9 |
| Grey Partridge | -18 |
| Bullfinch | 6 |
| Turtle Dove | -45 |
| Song Thrush | 4 |

* Advances in knowledge about species’ response to habitat management

A literature review was carried out to identify if there had been significant advances in knowledge about how species respond to land use and habitat management. This included the specific consideration of agri-environment schemes (eg Natural England 2009, Roberts and Pullin 2007, Scott Wilson 2009) and species specific studies that were relevant to the suite of bird species used in the modelling process (eg Chamberlain *et al* 2009, Davey *et al in press*, Siriwardena *et al* 2006, Siriwardena *et al* 2008). This review did not identify a need to change the basic model used in the estimation of bird response to agri-environment scheme uptake.

* Changes in agri-environment scheme payment rates

GHK (Rayment *in litt* 2010) advised that revisions should be made to the costs of scheme uptake used in the modelling process, in line with revisions made in the HAP costings work. The costs of habitat management through agri-environment schemes applied in the calculation of the costs to achieve the targets for the suite of widespread bird species are listed in Table 3 with greater detail given later.

**Table 3: Costs of habitat management through agri-environment schemes.**

| **Scheme type** | **Locality** | **Annual cost (ha/annum)** |
| --- | --- | --- |
| Woodland management | UK | £81 |
| ‘Entry’ level scheme | UK | £30 |
| ‘Higher’ level scheme | England - Lowland | £358 |
| ‘Higher’ level scheme | England - Upland | £404 |
| ‘Higher’ level scheme | N Ireland - Lowland | £281 |
| ‘Higher’ level scheme | N Ireland - Upland | £266 |
| ‘Higher’ level scheme | Scotland - Lowland | £326 |
| ‘Higher’ level scheme | Scotland - Upland | £372 |
| ‘Higher’ level scheme | Wales - Lowland | £231 |
| ‘Higher’ level scheme | Wales - Upland | £216 |

# Results of the updated modelling and costing

The previous modelling exercise had carried out a series of model runs in order to optimise the targeting of agri-environment schemes to achieve the SAP targets for the suite of wider countryside birds for the least uptake of schemes and hence cost. The optimised scenario from the 2006 costing exercise was rerun to identify how well it satisfied the updated targets to 2020. The scenario was to:

* Concentrate spending in the lowlands
* Maintain a high ratio of woodland scheme and higher level scheme to entry level scheme.

The areas of scheme delivered per annum were 50 ha of ‘Entry’ level, 15 ha of ‘Higher’ level and 10 ha of woodland schemes. This was modelled over the two five year periods with the result that in the 1,000 ha modelled landscape units in the lowlands of the UK there would have been in each of the five year periods an additional:

* 250 ha in ‘Entry’ level scheme
* 75 ha in ‘Higher’ level scheme
* 50 ha in woodland management

The results of the rerun of the optimum model from 2006, presented as the BBS index and whether or not the target was achieved, are presented in Table 4.

**Table 4: Rerun of optimum model from 2006**

| **Species** | **Index at end of 2015** | **Target achieved** | **Index at end of 2020** | **Target achieved** |
| --- | --- | --- | --- | --- |
| Skylark | 151 | Yes | 229 | Yes |
| Linnet | 132 | Yes | 182 | Yes |
| Reed Bunting | 176 | Yes | 287 | Yes |
| Corn Bunting | 157 | Yes | 248 | Yes |
| Spotted Flycatcher | 115 | Yes | 137 | Yes |
| Tree Sparrow | 205 | No | 372 | Yes |
| Grey Partridge | 140 | Yes | 203 | Yes |
| Bullfinch | 167 | Yes | 276 | Yes |
| Turtle Dove | 120 | Yes | 152 | Yes |
| Song Thrush | 183 | Yes | 332 | Yes |

The rerun of the model from 2006 does not achieve an optimum outcome because there is considerable overshoot of the targets at the end of the second five year period.

As a result the iterative optimisation process that was carried out in 2006 was repeated to identify the optimum mix of scheme type and uptake to achieve the targets without significant overshoot of any modelled population. This iterative process identified that the optimum mix under the targets for the two five year periods was:

* Concentrate spending in the lowlands
* Maintain a high, but adjusted, ratio of woodland scheme and higher level scheme to entry level scheme.

The iteration identified that the optimum mix of scheme type delivered per annum was 75 ha of ‘Entry’ level, 13 ha of ‘Higher’ level and 8 ha of woodland schemes. This was modelled over the two five year periods. In the 1,000 ha modelled landscape units in the lowlands of the UK in each of the five year periods there would have been an additional:

* 375 ha in ‘Entry’ level scheme
* 65 ha in ‘Higher’ level scheme
* 40 ha in woodland management

The results of the new optimum model, presented as the BBS index and whether or not the target was achieved, are presented in Table 5.

**Table 5: The new optimum model**

| **Species** | **Index at end of 2015** | **Target achieved** | **Index at end of 2020** | **Target achieved** |
| --- | --- | --- | --- | --- |
| Skylark | 153 | Yes | 234 | Yes |
| Linnet | 127 | Almost | 166 | Yes |
| Reed Bunting | 171 | Yes | 271 | Yes |
| Corn Bunting | 151 | Yes | 228 | Yes |
| Spotted Flycatcher | 106 | Yes | 115 | Yes |
| Tree Sparrow | 197 | Almost | 345 | Yes |
| Grey Partridge | 134 | Almost | 184 | Yes |
| Bullfinch | 158 | Yes | 247 | Yes |
| Turtle Dove | 110 | Yes | 126 | Yes |
| Song Thrush | 167 | Yes | 277 | Yes |

There is still some ‘overshoot’ but it has been reduced although with the consequence that after the first five year period the targets for Linnet, Tree Sparrow and Grey Partridge are approached but not exceeded.

As was found in the process of optimisation in the previous modelling exercise two species were the primary influence on the mix and area of habitats required to be delivered to achieve the targets - Spotted Flycatcher and Turtle Dove. The secondary influences were Grey Partridge and Tree Sparrow.

As had been undertaken in 2006 a process of model optimisation was carried out that did not seek to achieve the Spotted Flycatcher and Turtle Dove targets. This found that the need to achieve the Grey Partridge and Tree Sparrow targets required a continuing high ratio of woodland scheme and ‘Higher’ level scheme to ‘Entry’ level scheme. As a result an optimum model was not found that had a scenario where the ‘Entry’ level scheme prescriptions played the main role in target delivery recognising that there would be failure to achieve the targets for Spotted Flycatcher and Turtle Dove.

The ‘new optimum’ model provides the basis for costing the achievement of the wider countryside targets. Table 3 above summarised the costs of the habitat management through the three components of agri-environment scheme across the UK - ‘Entry’ level schemes, the ‘Higher’ level schemes and woodland schemes. The costs of the ‘Higher’ level schemes vary by country and include both capital and annual payment elements. Table 6 and Table 7 provide information on how the capital and annual payments have been expressed as a single annual payment for lowland habitats and upland habitats respectively.

**Table 6: Costs of ‘Higher’ level schemes for lowland habitats**

| **Country** | **Lowland Habitat** |  | **Average annualised cost** |
| --- | --- | --- | --- |
|  | Lowland calcareous grassland | Lowland dry acid grassland |  |
| England | £631/ha capital  £280/ha annual | £925/ha capital  £280/ha annual | £358/ha/yr |
| N Ireland | £631/ha capital  £203/ha annual | £925/ha capital  £203/ha annual | £281/ha/yr |
| Scotland | £631/ha capital  £248/ha annual | £925/ha capital  £248/ha annual | £326/ha/yr |
| Wales | £631/ha capital  £153/ha annual | £925/ha capital  £153/ha annual | £231/ha/yr |

**Table 7: Costs of ‘Higher’ level schemes for upland habitats**

| **Country** | **Upland Habitat** |  | **Average annualised cost** |
| --- | --- | --- | --- |
|  | Upland calcareous grassland | Upland hay meadow |  |
| England | £631/ha capital  £280/ha annual | £1,852/ha capital  £280/ha annual | £404/ha/yr |
| N Ireland | £631/ha capital  £203/ha annual |  | £266/ha/yr |
| Scotland | £631/ha capital  £248/ha annual | £1,852/ha capital  £248/ha annual | £372/ha/yr |
| Wales | £631/ha capitals  £153/ha annual |  | £216/ha/yr |

The costs of the delivery of the new optimum model are presented in Table 8 below. They are presented as a cost per year that has been averaged over each of the five year periods. It should be noted that expenditure is not even across the years but rises progressively as additional habitat is created through environmental schemes. It should also be noted that these costs are additional to environmental scheme expenditure in the preceding years. For the period 2011-15 the costs are additional to current agri-environment scheme expenditure. For the period 2016-20 the costs are additional to both current agri-environment scheme expenditure and the expenditure identified for the period 2011-15. Such expenditure is needed to retain the gains in habitat management and creation of preceding years.

**Table 8: The cost of the new optimum model**

|  |  |  |
| --- | --- | --- |
| **Area** | **Additional Cost 2011-15 (£m/yr average over 5 years)** | **Additional Cost 2016-2020 (£m/yr average over 5 years)** |
| **United Kingdom total** | **293** | **293** |
| England | 211 | 211 |
| Northern Ireland | 16 | 16 |
| Scotland | 48 | 48 |
| Wales | 18 | 18 |

This predicted cost of £293 million per year compares to the estimate of £353 million per year made in the earlier study for the five year period up to 2006 – 2010 for the same suite of wider countryside birds.

# Discussion

The previous costing exercise underwent a process of accounting for habitat action that will benefit wider countryside species that were not used in the modelling. In the previous exercise this did not add any significant costs. It is likely that delivering the wider countryside SAPs to 2020 will require significant additional costs to be estimated. This is considered to be the case because the new SAPs include a number of freshwater species, including migratory fish, of widespread occurrence. The uptake of agri-environment schemes modelled above will provide benefit to these species through a likely reduction in diffuse water pollution and the creation and management of riparian habitat. Those agri-environment schemes will not though provide the channel restoration works that would benefit many species and not provide the removal of structures that are an obstruction to migratory fish passage. These actions would need additional costing.

The previous costing exercise also underwent a process of removing any habitat costs that had been, in effect, ‘double-counted’ between the costs produced for the HAPs and the habitat creation for the wider countryside species. If similar adjustments (in the order of £19 million/yr) are appropriate for the wider countryside SAPs over the period 2010 to 2020 then the adjusted cost of achieving those targets is in the order of £274 million per year. An estimated breakdown of this cost by country is given in Table 9.

**Table 9: Estimated breakdown of widespread species costs by country, 2011-2020**

|  |  |
| --- | --- |
| **Area** | **Additional Cost 2011-2020 (£m/yr)** |
| England | 197 |
| Northern Ireland | 15 |
| Scotland | 45 |
| Wales | 17 |
| **UK total** | **274** |

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# Annex 3: Revised Estimates of BAP Funding

# Annex 3: estimated expenditures contributing to uk bap

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