

*Focus on*

# **Biodiversity**



## **Update 2003/4**



ENVIRONMENT AGENCY

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## CHAPTER 1 INTRODUCTION

### Purpose of the report

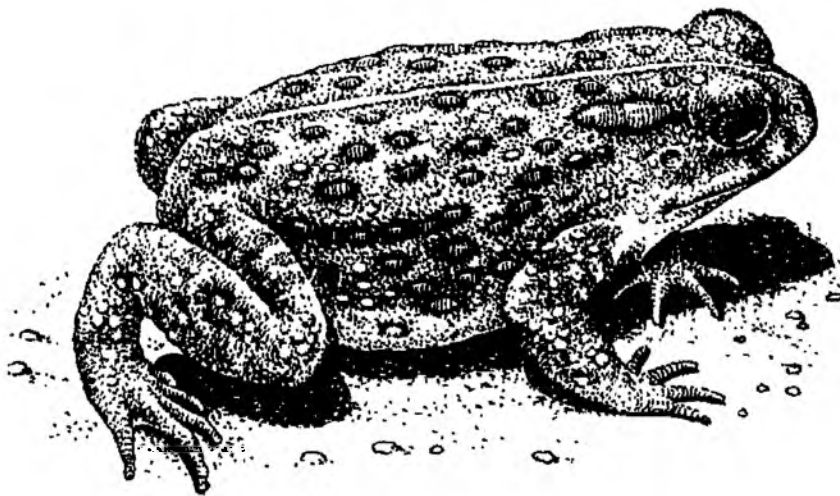
- 1.1 This report summarises progress made by the Environment Agency in carrying forward its principal obligations under the UK Biodiversity Action Plan (UK BAP), during the period 1 January 2003 – 31 March 2004.
- 1.2 It is primarily an internal report aimed at our own staff, although relevant government departments, statutory and voluntary wildlife organisations, local government and professional and academic institutions will also have an interest in the contents. An electronic version is available on our internal intranet and on our website, [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk).

### Background

- 1.3 In July 2000 we published "*Focus on biodiversity: the Environment Agency's contribution to wildlife conservation*"<sup>1</sup>. It set out comprehensively our role, obligations and involvement in wildlife conservation, and in particular our actions under the UK BAP in the 5 year period 1995-99. We said that this would set the baseline reference document for tracking progress and that we would report annually to this effect, making more detailed appraisals every 5 years. This document is the fourth annual progress report, covering the year 2003/4.

### Structure and content

- 1.4 Feedback on *Focus on Biodiversity* was extremely good, both in terms of its design and content and the 2000 edition was given a Communication in Business (CiB) award for excellence. We have tried to repeat the successful presentational style by using a simple format with a minimum amount detailed text and jargon.
- 1.5 The 2003/4 report concentrates mainly on the 39 species and 5 habitats for which we have a lead role under the UK BAP and we have identified progress on our actions for each species and habitat secured through promotional, project and research work. As before, we have also estimated, using broad categories, the amount of effort and resources used and provided a brief summary of intended action in 2004/5. Background technical information has been omitted because the ecology, distribution and main threats are all included in *Focus on Biodiversity*.
- 1.6 We also highlight actions undertaken for a selection of those species where we are not the UK BAP lead, but where we have specific actions to help.
- 1.7 An updated list of Agency co-ordinators is appended, and we also provide in subsequent appendices, lists of (i) partner organisations; (ii) abbreviations and acronyms; (iii) scientific names used in the text; and (iv) R&D project outputs.
- 1.8 Thanks again to English Nature for permission to use some of the line drawings that made *Focus on Biodiversity* so attractive.



## CHAPTER 2 AN OVERVIEW OF 2003/4

### LEGISLATION AND NATIONAL POLICY

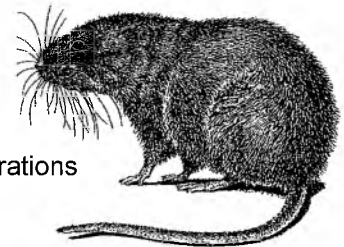
- 2.1 During the year we consolidated our implementation of the Habitats Directive and the Countryside and Rights of Way Act (CRoW Act) and stepped up our development of technical tools needed for implementing the ecological monitoring and assessment aspects of the EC Water Framework Directive (WFD).

#### **Habitats Directive**

- 2.2 Significant further progress was made with the Review of Consents programme, starting with an exercise to ensure that priority is given to tackling actions for those sites where the most benefit can be realised through changes made to Agency permissions. Work on Stage 3 appropriate assessments continued for high priority sites, using the results of local site investigation work and outputs from nationally commissioned research.  
<http://www.environment-agency.gov.uk/business/444217/444663/295641/?version=1&lang=e>
- 2.3 The Habitats Directive Handbook was extensively reviewed. Keeping the handbook up-to-date is essential so that Agency staff can confidently follow procedures and technical guidance that help them to carry out Habitats Directive assessments. The joint EA/EN/CCW technical advisory groups have continued to be a fundamental part of resolving complicated problems and improving the guidance.

#### **CRoW Act**

- 2.4 Joint Agency/EN/CCW CRoW Act guidance on 'Dispute Resolution' was approved and disseminated in October 2003. This helps to resolve areas of misunderstanding, and clarifies roles and responsibilities of all three organisations. Specific areas where this guidance has been successfully used includes issues relating to Flood Risk Management operations and Waste exemptions.



#### **Wetland policy**

- 2.5 We have produced a policy for wetlands which aims to: (i) demonstrate how the Agency will fulfil its responsibilities towards wetlands; (ii) provide an overall statement of intent and greater clarity on our role with respect to wetlands in a single strategic document for internal and external use; (iii) list key areas of work and priorities for the Agency; (iv) ensure a nationally consistent approach and make all staff are aware of the advantages of wetland conservation and their potential involvement.  
<http://intranet.ea.gov/news/articles/wetlands.htm>

#### **Water Framework Directive**

- 2.6 The Environment Agency has work in place to prepare for and to implement the detailed requirements of this Directive. This work contributes to a co-ordinated programme for the UK involving colleagues primarily from the Scottish Environmental Protection Agency and the Northern Ireland Environment and Heritage Service.

During the year progress has been made on the following items:

- A reporting typology for lakes and rivers with broad descriptions of the expected ecological reference conditions for each type was completed.
- Criteria for ecological risk assessment for lakes and rivers were developed and applied in England & Wales.
- An assessment of acid deposition and eutrophication was applied to lakes in England & Wales.
- Guidance on the risk assessment of alien species in lakes and rivers was developed and applied in consultation with the conservation agencies.
- We have begun to develop monitoring techniques using phytoplankton and macrophytes in lakes and rivers and invertebrates in lakes. By the end of the year work was in place on each of these key biological elements. Two projects that have made particularly good progress are the development of a classification method for lake macrophytes and the analysis of "chironomid exuviae" (the skins that are shed by non-biting midge larvae) in the assessment of lake quality.
- During the summer of 2003 a pilot survey of about 50 lakes was undertaken to collect data on each of the biological elements.
- A lake habitat survey technique was developed in collaboration with the conservation agencies (led by Scottish Natural History).

### **Defra PSA target for improving SSSIs**

- 2.7 Our contribution to protecting and improving the condition of SSSIs is twofold: We own about 5000ha of SSSI land (about 0.5% of the total area of SSSIs in England), but we influence a much larger area through our regulatory and operational activities affecting other SSSIs. English Nature confirmed that 76% of our SSSI land is in favourable condition, which compares with the national average of 58%. We began developing a work programme to remedy damaging action for which we have direct control. For a large number of SSSIs, we are only minor part-owners and have no influence on the condition of the site. We are represented on the Defra Major Landowners Group and also the Director-level Biodiversity Implementation Group which has representation from right across Government.

### **National Biodiversity Groups**

- 2.8 We continue to be on the England Biodiversity Group and to act as the lead co-ordinator for implementing the "Water and Wetlands" theme of the England Biodiversity Strategy. We are involved in the follow-up to the Defra Review Group on Non-native Species and consolidated our involvement with the National Biodiversity Network. We maintained a high profile role in several BAP steering groups, including those for water vole, otter, southern damselfly and chalk rivers.

### **Ramsar**

- 2.9 We continue to be actively involved in Ramsar work. The role of the UK Ramsar Committee has now evolved into separate *Natura 2000* and Ramsar groups. The reason for this is that many overriding principles and work, on *Natura 2000* sites also apply to the majority of UK Ramsar sites.
- 2.10 Defra's aim is that the Forum and the Steering Committee should together make up the UK Ramsar Committee in order to maintain an open approach. Ramsar targets and other issues can be discussed in both groups. Papers from the Steering Committee and Forum are posted on the Defra Website (<http://www.defra.gov.uk/>).



### **National initiatives**

- 2.11 Our Regions and Areas have continued to help secure biodiversity benefits through implementation of the National Environment Programme of AMP3, Water Level Management Plans, flood and coastal defence works, the Habitats Directive Review of Consents and major external funding partnership projects. We are confident that implementation of these, a good outcome for the fourth quinquennial Review of Water Company Prices (PR04), practical Catchment Flood Management Plans and implementation of the Water Framework Directive will collectively help to secure long-term improvements for wildlife, particularly in protected sites. We can help improve habitat conditions in the wider countryside with rivers acting as a network of wildlife corridors. To support this we continued to develop our non-statutory river habitat objectives (RHOs), using information from the River Habitat Survey database (now containing 17,000 sites from the UK) and other datasets.

### **UK BAP delivery**

- 2.12 During 2003/4 we spent £7 million on more than 400 UK BAP and LBAP projects. We did this in collaboration with a wide variety of external partners, yielding a further £10 million of project money. Work included large-scale wetland creation in association with flood defence schemes at locations such as Hullbridge and Halvergate in Norfolk and Sladesbridge in Cornwall. We were able to support surveys of several habitats and species including wet woodland, fens, vegetated shingle, exposed riverine sediment invertebrates, freshwater pearl mussels, water voles, crayfish, multi-fruited river moss, great-crested newts and barn owls.

### **Environment Agency Board discussion**

- 2.13 There was a good discussion session on "delivering biodiversity across the Agency" at the November Board meeting. Board members were particularly anxious that we could demonstrate all parts of the business doing their bit for biodiversity and strongly supported the need for regional biodiversity and priority-based work programmes.

### **National seminar**

- 2.14 A very successful seminar highlighting how our conservation and ecology work is applied in practice was held in Sutton Coldfield in November. It attracted more than 200 delegates and the general "buzz" reflected the infectious enthusiasm of those attending, keen to share experiences and learn about the wide range of activities going on across the Agency.

### **Otter surveys**

- 2.15 The Otter Survey of England 2000-2002 was published in May 2003. The launch produced good media interest and told a good news story with otters continuing their recovery across England. The Otter Survey of Wales 2002 published in April 2004 reports similar good news across Wales.

### **LIFE in UK Rivers**

- 2.16 Results of this highly successful EU funded project were launched in London in February 2004. Several high quality and very attractive handbooks were produced and these are available as pdf files on the website <http://www.riverlife.org.uk/> managed by English Nature. The European Commission has been very impressed and as an added bonus the favourable exchange rate when the final instalment was paid has meant that some extra money can now be spent on some follow-up promotional work.

### **Marine**

- 2.17 It has been a very busy time, with a number of key developments in relation to marine environmental policy, both within the Agency and externally.
- 2.18 In November a new senior post, that of Head of Wildlife, Recreation and Marine was created. For the first time this post brings an Agency focus for the marine that is important both internally and externally. One of the first priorities for Chris Mills, our new Head of WRM, is to develop a Marine Strategy for the Agency that will bring real clarity about our role and objectives in the marine environment and set a policy framework to work within. This is important because although the Agency is involved in a wide range of activities relating to the marine environment, currently no overarching Agency objectives for the marine environment exist. Such a strategy will enable the Agency to state its position on the marine environment and be more influential in shaping development of Government marine policy. A Marine Strategy Group comprising Policy, Process and Operational representatives has been set up to help develop the strategy by the end of March 2005.
- 2.19 Several important Government marine reviews are now finishing. These include Review of Marine Nature Conservation (RMNC); Review of Marine Fisheries and Environmental Enforcement; UK Fisheries Project (for a sustainable and profitable future for the UK fishing industry) and the Review of Development in marine and coastal waters (looking at simplifying current consenting regimes). The Review of Marine Nature Conservation endorses an 'ecosystem approach' to management and recommends a number of measures to improve marine nature conservation management. It proposes a new framework for marine nature conservation designed to allow Government to meet its international obligations to sustainable development and biodiversity. Other key recommendations from this review include a trial of marine spatial planning at a regional sea scale; establishment of an ecologically coherent network of marine protected areas and a co-ordinated UK-wide marine information network.
- 2.20 It is looking increasingly likely that Government will announce a 'Marine Bill' in response to mounting pressure for improvements to how the marine environment is managed. The Agency is working hard to develop a robust position and influence key stakeholders to ensure that any legislative changes enable us to continue to carry out our duties. This is particularly important in terms of our role in integrated management across inland freshwater and marine environments, especially as competent authority for Water Framework Directive.

### **Research and Development Programme**

- 2.21 Our Conservation R&D programme continues to produce good quality outputs and several more were produced in 2003/4: (Appendix 5).

### **Biodiversity Action Reporting System (BARS)**

- 2.22 The Biodiversity Action Reporting System or BARS, is being developed by English Nature, The Scottish Executive, Scottish Natural Heritage and the Wales Biodiversity Partnership. General release is planned for October 2004.
- 2.23 It is designed to support the planning, monitoring and reporting requirements of national and local Biodiversity Action Plans. It will be used to report the next round of progress in 2005.
- 2.24 The Agency has been involved in the design of the system from an early stage. The system is web-based so no special software is needed. The Agency will begin using the system in December 2004. At first Biodiversity staff will be responsible for entering information on the Agency's BAP Actions, but they will need to collate that information from across the Agency.



- 2.25 BARS will not hold information on the specific whereabouts, requirements or status of BAP species or habitats. It stores what each of the hundreds of organisations involved in the UK BAP are doing towards the national targets.
- 2.26 Using the BARS system, the Agency will be able to:
- summarise the cost per species or habitat of its BAP activities by catchment or Area or Region;
  - list actions which are behind schedule;
  - identify any other organisation undertaking similar activities; and
  - quantify the blockages to progress; resources, land owner engagement, lack of knowledge or habitat requirements etc.

#### **Competencies and skills**

- 2.27 We are acutely aware that we need to attract, maintain and develop the ecological expertise, and competencies to enable our staff to perform effectively. We started a competency framework, first year training plan and Continuing Professional Development initiative for Agency ecologists. We also ran some very successful introductory conservation training days for new staff and those in other functions.

#### **OVERALL MESSAGE**

- 2.28 It is pleasing to see that we're continuing to deliver significant progress on many of our UK BAP obligations, and better quantify what we are doing and what we still need to do.
- 2.29 Development of costed work programmes based on regional biodiversity strategies has confirmed that about half of our UK BAP actions are delivered as part of the routine work of core functional activities. Where we have always struggled is funding the discretionary activities associated with our duty to promote conservation.
- 2.30 The injection of £300K windfall money from Defra in the third quarter of 2003/4 enabled us to progress work with partners totalling £1m in that period, thereby demonstrating the added value return we give to what, in Agency budget terms, is a very small amount of investment.
- 2.31 This cash injection enabled us to progress 181 UK BAP-related actions in 2003/4, a marked improvement on the two previous years (Table 1 and 2). We also started work for three species (burbot, violet crystalwort and beaked beardless moss) which had previously been unfunded. Only two species (tiny fern moss and cut grass) now remain on the starting blocks.
- 2.32 The worry is that the first casualty of financial cutbacks is always the discretionary biodiversity work activities. Any cut in national and regional project money or the failure of Spending Review bids will seriously impede our ability to sustain a credible profile in the UK BAP.

**Table 1**

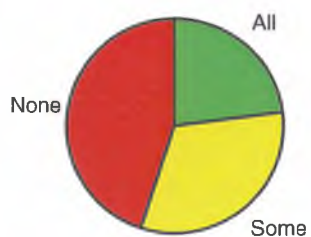
<b>All actions progressed since 1995</b>	<b>No actions since 1995</b>
Marsh warbler Allis & twaite shad White-clawed crayfish Southern damselfly Diving beetle – <i>Bidessus unistriatus</i> Shining ram's horn snail Little whirlpool ram's horn snail Depressed river mussel Water rock bristle Multi-fruited river moss Ribbon-leaved water plantain Violet crystalwort Chalk rivers Mudflats Salt marsh <i>Tolypella intricata</i> - stonewort	Tiny fern moss Cut grass



Figure 1

**UK BAP ACTIONS IN PROGRESS: SPECIES AND HABITATS WITH ALL ACTIONS UNDER WAY, SOME UNDERWAY AND NONE UNDERWAY**

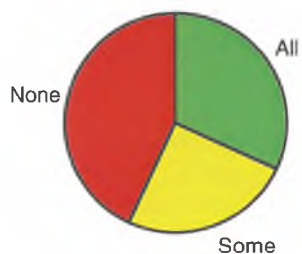
**All UK BAP species and habitats (from JNCC)  
1995-2001**



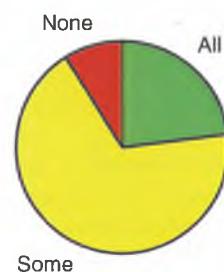
**Agency-led species and habitats  
1995-2001**



**Agency-led species and habitats  
1995-2002**



**Agency-led species and habitats  
1995-2003/4**



## CHAPTER 3

## PROGRESS IN 2003/4 – CATEGORY 1 & 2 SPECIES AND HABITATS

- 3.1 This chapter documents for each of the 39 species and 5 habitats for which we have the lead role, the UK BAP actions requiring Agency action and our contribution in 2003/4. This is summarised in broad categories: X represents no action; one, two or three ticks represent some, moderate and good progress respectively. Data for 1995-99, 2000, 2001 and 2002 are shown for comparison.
- 3.2 Some examples of project work in 2003/4 are listed along with estimates of resources invested. Where known, examples of activities planned for 2004/5 are included.
- 3.3 Table 2 gives an overview of the Agency's contribution to actions since 1995 and illustrates the trend (stable ☺, declining ☹, increasing ☺, unknown ?) of each species and habitat as assessed by the Joint Nature Conservation Committee (JNCC) for 2002. NB Given that most trends are based on qualitative data, there are many uncertainties regarding cause-effect relationships and there is often a time lag between action and response, the trends cannot be directly linked to the number of Agency actions undertaken.

Table 2

Species/habitat with trend as at the end of 2002		Actions required by Agency	1995-99	2000	2001	2002	2003/4
Water vole	☹	15	13	13	12	13	13
European otter	☺	13	12	10	11	10	9
Marsh warbler	☺	3	3	3	3	2	2
Allis & twaite shad	☹	4	4	3	1	2	1
Vendace	?	7	6	5	3	3	4
Burbot	?	8	0	0	0	0	2
<i>Bidessus unistriatus</i>	☹	5	0	1	1	4	5
<i>Bidessus minutissimus</i>	☹	5	2	4	4	1	1
<i>Agabus brunneus</i>	☹	3	0	1	1	0	0
<i>Anisodactylus poeciloides</i>	?	2	0	0	1	0	0
Hairy click beetle	?	9	2	2	3	4	7
River shingle beetles	?	10	4	3	0	4	8
White-clawed crayfish	☹	10	10	10	9	10	10
Southern damselfly	☺	4	4	4	4	4	4
<i>Clorismia rustica</i>	☹	4	1	2	0	1	1
<i>Spiriverpa lunulata</i>	☹	9	3	2	0	5	5
Glutinous snail	☺	8	7	6	3	3	3
Shining ram's horn snail	☹	4	4	4	3	3	3
Little whirlpool ram's horn snail	?	8	8	7	7	6	5
Freshwater pearl mussel	☹	9	8	5	3	5	7
Depressed river mussel	☹	3	3	3	1	3	3
Fine-lined pea mussel	☹	8	3	4	3	3	4
River jelly lichen	?	8	5	5	4	1	4
Violet crystalwort	?	1	0	0	0	0	1
Freshwater bryozoan	?	6	0	0	0	3	4
Multi-fruited river moss	☺	2	0	0	2	0	1
Tiny fern moss	?	3	0	0	0	0	0
Beaked beardless moss	?	3	0	0	0	0	2
Water rock bristle	?	1	1	1	1	1	1
Stoneworts (5 species)	☺	7	0	0	0	1	3
Ribbon-leaved water plantain	☹	2	2	2	0	0	2
Cut grass	☺	5	0	0	0	0	0
Triangular club rush	?	9	7	7	2	2	3
Greater water-parsnip	?	4	0	1	3	1	1
Chalk rivers	☹	10	9	10	10	10	10
Fluctuating water bodies	☺	13	7	4	5	6	7
Eutrophic lakes	☹	27	23	18	22	20	21
Mudflats	?	8	5	8	8	8	8
Saltmarsh	☹	16	9	16	16	16	16
<b>TOTALS</b>		<b>276</b>	<b>165</b>	<b>164</b>	<b>146</b>	<b>155</b>	<b>181</b>

## Water vole - *Arvicola terrestris*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: pages 34-36

Agency co-ordinator: Alastair Driver

Lead partner: UK Water Vole Steering Group

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1	Ensure appropriate protection under the Wildlife & Countryside Act for the water vole and its habitat	✓✓✓	✓✓✓	X	✓✓✓	✓
5.2	Incorporate water vole conservation into relevant habitat policies and agri-environment schemes	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓
5.3	Identify large, viable breeding populations of water vole and retain these with appropriate management and monitoring, from which a series of "key areas" should be designated.	✓✓✓	✓✓	✓✓✓	✓✓✓	✓
5.4	Incorporate water vole conservation into integrated area management plans (eg local BAPs, Environment Agency LEAPs, integrated catchment management plans etc), initially targeting areas as identified in Action 3.	✓✓✓	✓✓✓	✓✓✓	✓✓	✓
5.5	Ensure that development schemes do not affect the integrity of water vole populations.	✓✓	✓✓	✓	✓	✓
5.6	Using survey information, identify sites which are suitable for re-establishing populations.	✓✓	✓	✓	✓✓✓	✓
5.7	Where necessary employ appropriate mink control as a conservation tool to protect large breeding water vole populations.	✓✓	✓✓	✓✓	✓✓✓	✓
5.8	Following relevant research, establish a co-ordinated programme of translocation and reintroductions of water voles with local provenance where it is deemed appropriate and effective.	✓	✓	✓✓	✓✓✓	✓
5.9	Ensure information on water vole conservation requirements and appropriate habitat management are available to all riparian owners, managers and advisers (through guidelines and a practical handbook of water vole conservation).	✓	✓	✓✓	✓✓✓	✓
5.10	Promote European co-operation in the study and conservation of threatened populations of water voles.	X	X	X	X	X
5.11	Ensure that the relative status and distribution of the water vole in Britain is monitored through repeats of the national baseline survey together with general catchment-based surveys in each region to determine the extent of the water vole populations and level of fragmentation of suitable habitat.	✓✓	✓✓	✓✓	✓✓✓	✓
5.12	Continue existing and establish new national research initiatives on the ecology and conservation requirements of water voles.	✓	✓	✓✓	✓✓	✓
5.13	Encourage the submission of data collated on a local level to LRC or BRC for incorporation into a national database, and to facilitate easier access to information.	✓✓	✓✓	✓✓	✓✓	✓
5.14	Encourage the publication of research papers and features in popular press, magazines and the broadcast media to raise the profile of the species.	✓✓	✓✓✓	✓✓✓	✓✓✓	✓
5.15	Prepare school education resource material for nation-wide distribution.	X	X	X	X	X

### Examples of project work

- The National Key Sites partnership project was extended for another 3 years with aim of: restoring habitats in priority National Key Sites, expanding the National Key Sites series, determining whether grazing marshes and reedbeds provide a sustainable refuge for water voles from mink predation, assessing the impact of intermittent mink control on water vole populations at National Key Sites and monitoring whether the proposed measures lead to recolonisation of National Key Sites and whether populations at National Key Sites are sustained.

- Sussex's water vole population leapt by over 300% following an innovative three-year partnership project, which involved scientific surveys, mink trapping, flood defence maintenance and conservation plans to halt the decline of the water vole in the county.
- The Water Vole Slide Pack version 2 was produced in collaboration with EN and the Wildlife Trusts and distributed free to all EA, WT and EN offices, as well as to numerous other organisations working on water vole conservation.
- Contributory funding was found for several mink control projects, eg Norfolk, Romney Marsh in Kent, River Avon in Wilts, and the Lee Valley in North London. The highly successful and efficient Game Conservancy Trust rafts are now being utilised in these projects.

#### **Agency contribution in 2003/4 = £100K**

#### **Action planned for 2004/5**

- Government announcement on full legal protection for water voles expected, following public consultation now due in summer of 2004. Major publicity opportunities anticipated.
- Water Vole Conservation Handbook version 2 to be drafted, subject to available funding.
- Mink control project to continue and expand within priority areas, especially in the "Wessex" priority area, which extends from Avon and Somerset through Wilts to Hants across the South West peninsula.

## Otter - *Lutra lutra*

Category: 1

Contact Point: Environment Agency

Focus on biodiversity page: 37-39

Agency co-ordinator: Graham Scholey

Lead Partner: Environment Agency/The Wildlife Trusts

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.3	Seek to determine, by 2000, Statutory Water Quality objectives for standing and running in Britain which will sustain otters.	X	X	X	X	✓
5.1.5	Identify and resolve problems with existing legislation. Seek to clarify the definition of traps in WCA 1981 and resolve inconsistencies over the use of otter guards on fish traps.	✓	✓✓	✓✓	✓	✓
5.2.1	Seek to include action for otters in LEAPs* for all areas by 2005, including "otter havens" in relevant areas.	X	✓✓	✓✓✓	✓	✓
5.2.3	Produce catchment based local habitat management plans identifying key areas for restoration and enhancement.	✓✓	✓	✓	X	✓
5.3.3	Attempt to limit accidental killing or injury (eg by provision of road underpasses and fyke net guards) particularly on key catchments.	✓✓✓	✓✓	✓✓	✓✓	✓
5.4.1	Ensure the provision of information on otter requirements and conservation to key groups, to include landowners, through the publication of posters or guidelines.	✓✓	✓	✓✓	✓	✓
5.5.1	Collate information on prey productivity biomass and pollutions in occupied and likely recolonisation areas.	✓✓	✓	✓✓	✓	✓
5.5.2	Develop a standard methodology to analyse the level of pollution accumulation in otters.	X	X	✓	✓	✓
5.5.3	Investigate the effects of disturbance on otter populations.	X	X	X	X	X
5.5.4	Develop and implement methods to estimate otter numbers and permit population modelling.	✓✓✓	✓	✓✓	✓✓	✓
5.5.5	Monitor populations and distribution of otters throughout the UK, including local survey to monitor the expansion of fringe populations.	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓
5.5.7	Develop a methodology for identifying otter breeding areas and produce guidelines for the protection and creation of breeding habitat.	✓✓	✓✓	✓✓	✓	✓
5.6.1	Use this popular species to publicise the importance of water quality and riparian habitats to biodiversity	✓✓✓	✓	✓✓	✓	✓

\*LEAPs replaced by Local Contributions

### Examples of project work

- The publication of the Fourth Otter Survey of England was a major achievement. The Agency-produced report was launched on 12 May and received significant national and local media coverage, highlighting the continued recovery of the otter population but also the current threats and concerns in relation to the objective of full recovery to all catchments by 2010. The survey was a collaborative effort by many surveyors but the production of the report was a major achievement for survey organiser and project manager Andrew Crawford.
- The report for the Otter Survey of Wales was also completed to final stages prior to launching in the forthcoming financial year. The report highlights the continued recovery and consolidation in Wales, and the final writing up represents a major commitment of time from the Agency co-author Teg Jones.
- Area staff were involved in consolidating our knowledge of local status and distribution by organising and undertaking local surveys, which complement the information provided by the national surveys.
- Agency conservation staff in most areas continue to collect otter corpses for the post-mortem and tissue analysis R&D work, which is now at the write-up stage. However, after a substantial amount of internal liaison and discussion with Chemicals Policy, Science and other departments, the otter p-m and tissue analysis work has finally been incorporated into the Agency's routine chemicals monitoring strategy. This is a milestone achievement for all those conservation staff who have long argued that this work should be mainstream environmental monitoring for the Agency, and owes a lot to the time and effort put into liaison on this issue by Lyn Jenkins.

- Some regions and areas, particularly South West Region, have put considerable effort into the provision of otter predation advice at stillwater fisheries, especially carp fisheries. This has also prompted renewed media interest, with the need for the Agency to respond to a number of misleading articles in the angling press. Research is also underway, funded from Fisheries, to clarify best designs for otter-proof fencing and when available should inform a badly-needed update on the published advice to specialist stillwater fisheries on ways of protecting vulnerable stock.
- The Agency is currently co-funding Water for Wildlife/Otters and Rivers Project officer posts with 13 Wildlife Trusts, emphasising our continued support for the provision of conservation advice through our lead partners in the delivery of the UK BAP. These Project Officers provide a vital advisory and advocacy role in many areas where otter populations are still well below capacity, and also work to influence wider management and enhancement of rivers and wetlands, e.g. the securing of £60K of agri-environment monies for the Itchen and Test.
- Agency staff across England and Wales continue to be heavily involved in influencing the planning process to achieve satisfactory provision of safeguards against otter roadkill, primarily for new road schemes but also other developments. In addition, in Devon a collaborative Otters and Roads Mitigation Project targeted three black spots for otter roadkill to implement mitigation works, and the otter death database for South West and Southern England was converted under contract to a database that is easier to manage and interrogate. In Wales the Roads and Otters Steering Group continue to address the worst roadkill blackspots.
- The Agency contributed to the highly successful Otters in Europe Conference, held on Skye in July 2003, which attracted speakers from a range of European countries presenting papers on current conservation issues. Agency staff presented papers and chaired sessions, and some of the other papers reported on work funded and supported by the Agency, such as the otter post-mortem work and National Survey of England.
- Three valuable reports on otters were produced as outputs from the LIFE in UK Rivers Project: 'Otter Breeding Sites: Conservation and Management', 'Ecology of the European Otter' and 'Monitoring the Otter'.



**Agency contribution in 2003/4** = minimum of £95K spent directly on otter-orientated work, but at least £200K of habitat work which will indirectly benefit otters, and the total figure could be substantially more than this.

#### **Action planned for 2004/5**

- Publication of the Otter Survey of Wales 2002.
- Final reporting of the two contracts for otter post-mortem R&D, incorporating analysis of tissue samples undertaken by the Agency.
- Reporting by the Highways Agency of the national survey work undertaken for their Delivering Ministerial Targets for Otters project, with prioritised targeting of otter mitigation requirements on the Trunk road network
- Production of updated stillwater fishery predation advice, following outputs from the best practice otter-proof fencing research currently underway.
- Continued support for Water for Wildlife Officer posts.
- Further research on the use of DNA fingerprinting as a means of monitoring otter populations.
- Trialling the methodology outlined in the LIFE in UK Rivers report on Otter Breeding sites on the Taff, Ely and Vale of Glamorgan.

## Marsh warbler - *Acrocephalus palustris*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 40

Agency co-ordinator: Jeremy Burgess

Lead partner: RSPB/The Wildlife Trusts

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Incorporate riparian habitat management prescriptions into LEAPs to benefit the marsh warbler.	X	X	✓	✓	✓
5.2.1	Safeguard existing or recently abandoned breeding sites by carrying out appropriate habitat management, particularly scrub removal and maintenance of high water tables.	✓✓	✓✓	✓✓	✓✓	✓
5.4.1	Promote appropriate management of marsh warbler sites.	✓✓	✓✓	✓✓	✓✓	✓

### Examples of project work

- Habitat management works to encourage the development of willowherb in known and former breeding sites.
- Survey of additional areas where records of the species have been made for continued presence/breeding.
- Survey and monitoring of breeding populations.

**Agency contribution in 2003/4 = £4K**

### Action planned for 2004/5

- Habitat management works to facilitate population expansion.
- Collation of records outside core population in Kent and other counties.
- Monitoring of breeding populations.

## Allis and twaite shad - *Alosa alosa* & *Alosa fallax*

Category: 2

Contact point: Defra

Focus on biodiversity: page 40-41

Agency co-ordinator: Miran Aprahamian

Lead partner: Defra/Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needed Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.1	Identify and characterise spawning sites for twaite shad and use this information to identify potential spawning sites for both species of shad.	✓	✓	✓	✓✓	✓
5.4.1	Arrange workshops as necessary for conservation staff, non-Government organisations (NGOs) and land managers to explain the ecology, distribution and known requirements of shad.	X	✓	X	X	✓
5.5.1	Obtain quantitative information on spawning and nursery sites and relate these to habitat models such as RHS to aid in the prediction of potential spawning areas within catchments.	X	X	X	✓✓	✓
5.5.4	Investigate the use of hydroacoustic fish counters with shad recognition systems in rivers with known spawning populations as well as incidental catches by anglers and fishermen.	X	X	X	✓✓	✓

### Examples of project work

- Investigations into the genetic characteristics of twaite shad in the rivers Severn, Wye, Usk and Tywi.
- Assessment of burst and sustained swimming speed of twaite shad.
- Identification of spawning sites in the River Usk.
- Flow requirements of upstream migrating twaite shad in the River Wye.
- Review of consents in relation to shad.

**Agency contribution in 2003/4 = approx. £30K**

### Action planned for 2004/5

- Assessment of burst and sustained swimming speed of twaite shad.
- Identification of spawning sites in the rivers Wye, Usk & Tywi.



**Vendace – *Coregonus albula*****Category: 1**

Contact point: Environment Agency

Focus on biodiversity: page 42

Agency co-ordinator: **Cameron Durie**

Lead partner: Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	In waters of high biodiversity interest including those inhabited by vendace, stocking should be limited by legislation.	X	X	X	✓	✓
5.2.1	In Bassenthwaite and Derwentwater ensure that water quality, physical habitat and spawning grounds are protected.	✓✓✓	✓✓✓	✓	✓	✓
5.3.1	Promote local byelaws to prevent the use of livebait and associated translocation of fish into vendace waters and their catchments.	*	✓✓✓	✓✓✓	X	✓
5.5.1	Continue monitoring and research work on Bassenthwaite Lake and Derwentwater.	✓✓	✓✓	✓✓	✓✓	✓
5.5.2	Encourage periodic monitoring of populations that become established at other locations.	✓✓	X	X	X	X
5.5.6	Assess the feasibility of establishing additional self-sustaining populations in other waters in Cumbria.	X	X	X	✓	✓
5.6.1	Prepare and distribute information on vendace to interested parties in catchments of existing populations or where introduction is in progress or proposed.	X	X	X	✓	✓

\* Completed action

**Examples of project work**

- Development of the Bassenthwaite Lake Restoration Programme, which aims to restore the lake and its catchment, continued throughout the year.
- Fish population monitoring continued throughout the year. No vendace were caught on Bassenthwaite and all assumptions concerning the population size are inferred from echosounding. Due to the complexity of the fish population this situation is not considered to be satisfactory and discussions will be held with English Nature regarding the modification of the licence under which monitoring takes place.
- Limited sampling (which involved the Agency as a partner) carried out at two sites in Scotland which have been subject to introductions in recent years indicate successful breeding at one location.

**Agency contribution in 2003/4 = £10K****Action planned for 2004/5**

- Under the Bassenthwaite Lake Restoration Programme a bid for a substantial programme of work will be submitted to the Heritage Lottery Fund. The bid will include a number of projects aimed at vendace.
- Population monitoring in Bassenthwaite Lake and Derwent Water will continue.
- In conjunction with partner organisations attempts will be made to establish a self sustaining population in another water in Cumbria.

## Burbot – *Lota lota*

Category: 2

Contact point: English Nature

Focus on biodiversity page: 43

Agency co-ordinator: Keith Easton

Lead partner: Environment Agency

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Consider the conservation justification of re-establishing the burbot as a viable component of UK biodiversity.	✓	X	X	X	X
5.1.2	Take note of, and feed into, the review of fisheries legislation currently being undertaken by MAFF, and the development of policies on species and habitat translocations being developed by the country conservation agencies.	X	X	X	X	X
5.1.3	Based on the outcomes of the above decide whether re-establishment of self-sustaining populations of the burbot to parts of the former range is desirable and feasible. If so indicate likely locations etc as precursors to the preparation of a detailed reintroduction plan.	X	X	X	X	X
5.5.1	Review theories expounded for the extinction of the species in the UK, and current expert opinion, to reach a consensus on the likely causes.	✓✓	X	X	X	X
5.5.2	Assess the current relevance of the causes identified for extinction, to determine whether they would prevent successful re-establishment, or present any future threat.	X	X	X	X	X
5.5.3	Undertake reviews and further studies of the ecological requirements of burbot, and the nature of its niches in rivers.	X	X	X	X	X
5.5.4	Assess rivers within the historic range in England against the results of the above to ascertain whether the ecological requirements of the species can still be met in any of them.	X	X	X	X	X
5.6.1	Consider how to gain a broad constituency of views on the re-establishment of the burbot as a component of the UK biodiversity, and implement an appropriate strategy to that end.	X	X	X	X	X

### Examples of project work

- Attendance and production of a paper on burbot at Fisheries conferences.

### Agency contribution in 2003/4 = Staff time

### Action planned for 2004/5

- Support the applications of requests to introduce burbot by third parties in recirculation systems to study temperature regimes.

## A diving beetle - *Agabus brunneus*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 44

Agency co-ordinator: Martin Rule

Lead partner: Action for Invertebrates

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.2	Undertake a review of water abstraction policies within areas where the species occurs.	X	X	X	X	X
5.1.3	Address the requirements of this species in the LEAP process and in relevant WLMPs.	X	X	X	X	X
5.2.1	Where possible, ensure that all occupied habitat is appropriately managed by 2008.	X	X	X	✓	X

### Examples of project work

None

Agency contribution in 2003/4 = £0

### Action planned for 2004/5

- A potential new record will be investigated on The Lizard in Cornwall.
- A survey for *Agabus* is planned this year in the Red River, near Cambourne in Cornwall, to inform a potential river restoration/habitat creation scheme, including coastal and floodplain grazing marsh.
- Review all old records to determine additional survey needs.

## **A ground beetle - *Anisodactylus poeciloides***

Category: 1

Agency co-ordinator: Vacant

Contact point: Environment Agency

Lead partner: Action for Invertebrates

Focus on biodiversity: page 45

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.2	Address the requirements of this species in the LEAP process and in relevant Shoreline Management Plans	X	X	X	X	X
5.2.3	Encourage the creation of suitable saltmarsh habitat by managed retreat where possible.	X	X	X	X	X

### **Examples of project work**

None

### **Agency contribution in 2003/4 = £0**

### **Action planned for 2004/5**

None

## A diving beetle - *Bidessus unistriatus*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 47

Agency co-ordinator: Terry Clough

Lead partner: Balfour-Browne Club

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Address the requirements of this species in the LEAP process and in relevant WLMPs.	✓	✓	X	X	X
5.1.2	Take account of the species' requirement in response to applications for water abstraction licenses.	✓	✓	X	X	X
5.5.1	Undertake further surveys to determine the status of the species.	✓✓	✓	✓✓✓	✓	X
5.5.2	Conduct targeted autecological research to inform habitat management.	✓	X	X	X	X
5.5.3	Establish a regular monitoring programme for the species.	✓✓	✓	X	X	X

### Examples of project work

- Continued monitoring of the two populations at Catfield Fen and Clay Pond in the New Forest.
- Attempted captive breeding with no success.
- Sent genetic material to the Natural History Museum for DNA fingerprinting. This will determine whether the UK population is distinct from the French population. It is possible that *Bidessus unistriatus* is breeding in France then being blown over the channel to England as no larvae have been found in the UK to date.

**Agency contribution in 2003/4 = £4K**

### Action planned for 2004/5

- Population samples being sent to a captive breeding expert in Canada to try and successfully breed the species in captivity.
- Genetic finger printing results obtained. This will determine any future monitoring and survey work.

## Hairy click beetle – *Synaptis filiformis*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 48

Agency co-ordinator: Francis Farr-Cox

Lead partner: Invertebrate Action

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Address the requirements of the species in the LEAP process and in relevant WLMPs.	✓	✓	✓	X	X
5.1.2	Ensure that the habitat requirements of the species are taken into account in flood defence and channel maintenance activities in areas where the species occurs.	✓	✓	✓	X	X
5.2.1	Ensure that all occupied habitat is appropriately managed by 2008.	✓	✓	✓	✓	✓
5.2.2	Ensure that the habitat requirements of the species are taken into account in any development policies, plans and proposals likely to affect the River Parrett corridor.	✓	✓	X	X	X
5.5.1	Undertake surveys to determine the status of the species.	✓✓✓	X	X	✓✓	✓
5.5.2	Conduct targeted autecological research to inform habitat management.	*	X	X	X	X
5.5.3	Establish a regular monitoring programme for populations along the River Parrett.	X	X	X	X	X
5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in to national and international databases.	✓	X	X	X	X
5.6.1	Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved via articles within appropriate journals as well as by a publicity leaflet.	X	X	X	X	X

\* Completed

### Examples of project work

- Targeted autecological research on the species in particular to determine the life history and area of bank likely to be used by the species.
- Establish if the species is still present where it was previously recorded such as the tidal River Wye.

Agency contribution in 2003/4 = £2K

### Action planned for 2004/5

- None as yet

## Various river shingle beetles and other invertebrates associated with ERS

### A stiletto fly - *Clorismia rustica*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 55

Agency co-ordinator: Mike Williams

Lead partner: Environment Agency/ERS Group

Trend: ☹

### Shingle beetles

Category: 2

Contact point: CCW

Focus on biodiversity page: 49-51

Agency co-ordinator: Mike Williams

Lead partner: Environment Agency/ERS Group

Trend: ?

### A stiletto fly - *Spiriverpa lunulata*

Category: 2

Contact point: CCW

Focus on biodiversity page: 56

Agency co-ordinator: Mike Williams

Lead partner: Environment Agency/ERS Group

Trend: ☹

### A diving beetle - *Bidessus minutissimus*

Category: 2

Contact point: CCW

Focus on biodiversity page: 46

Agency co-ordinator: Mike Williams

Lead partner: Environment Agency/ERS Group

Trend: ☹

## River shingle beetles – *Perileptus areolatus*, *Bembidion testaceum*, *Lionychus quadrillum*, *Hydrochus nitidicollis*, *Thinobius newberyi* and *Meotica anglica*

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.2	Address the requirements of these species in the LEAP process, and in relevant catchment management plans.	X	X	X	✓	✓
5.1.3	Take account of the species' requirements in response to applications for water abstraction and discharge licenses.	✓	X	X	✓	X
5.2.1	Where possible, ensure that all occupied sites are appropriately managed, including the maintenance or restoration of appropriate flow regimes.	✓	X	X	X	X
5.2.2	Ensure that the habitat requirements of the species are taken into account in any development policies, plans and proposals, particularly in relation to river engineering.	✓	✓	X	✓	✓
5.4.1	Advise landowners and managers of the presence of these species and the importance of beneficial management for their conservation.	✓	X	X	X	X
5.4.2	Ensure that all relevant agri-environment project officers, members of regional agri-environment consultation groups, relevant drainage engineers and waterways managers are advised of locations for these species, their importance, and the management needed for their conservation.	✓	X	X	X	X
5.5.1	Continue to undertake surveys to determine the UK status of these species.	✓✓	✓	X	X	✓
5.5.3	Establish a regular monitoring programme for the species and their habitats.	X	X	X	X	X
5.5.4	Pass information gathered during survey and monitoring of these species to a central database for incorporation into national and international databases.	✓✓	✓	X	X	X
5.6.1	Promote opportunities for the appreciation of exposed riverine sediment species and of the	✓	✓	X	X	✓

	conservation issues associated with their habitats. This may be achieved by articles in conservation-related wildlife, environmental, and user-group (eg anglers) journals, by posters and leaflets, and by involving the media in a publicity campaign.					
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#### **Stiletto fly – *Clorismia rustica***

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Address the requirements of this species in the LEAP process and in relevant WLMPs.	X	X	X	✓	✓
5.1.2	Take account of the requirements of this species in response to applications for water abstraction or sand extraction from rivers.	X	X	X	✓	X
5.2.1	Where possible, ensure that all occupied sites are appropriately managed by 2005, for example through site management agreements.	✓	✓	X	X	X
5.4.1	Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation.	X	X	X	X	X

#### **Stiletto fly - *Spiriverpa lunulata***

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Address the requirements of this species through the LEAP process and in relevant catchment management plans and WLMPs.	X	X	X	✓	✓
5.1.2	Take account of the requirements of this species in response to applications for water abstraction or sand extraction from rivers.	X	X	X	✓	X
5.2.1	Where possible, ensure that all occupied sites are appropriately managed by 2010.	✓	✓	X	X	X
5.4.1	Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation.	✓	✓	X	X	X
5.5.1	Undertake surveys to determine the status of this species.	✓	✓	X	X	✓
5.5.2	Conduct targeted autecological research to inform habitat management.	X	X	X	X	X
5.5.3	Establish a regular monitoring programme for this species.	X	X	X	X	X
5.5.4	Pass information gathered during survey and monitoring of this species to a central database so that it can be incorporated in national databases.	✓	✓	X	X	X
5.6.1	Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved via articles within appropriate journals as well as by a publicity leaflet.	✓	✓	X	X	✓

#### **A diving beetle – *Bidessus minutissimus***



UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes and for river restoration schemes.	X	X	X	✓	✓
5.1.2	Take account of the species` requirements in response to applications for water abstraction and discharge licences.	X	X	X	✓	X
5.1.3	Address the requirements of this species in the LEAP process and in relevant catchment management plans and WLMPs.	X	X	X	✓	✓
5.2.1	Where possible, ensure that all occupied habitat is appropriately managed by 2010.	✓	✓	X	X	X
5.2.2	Ensure that the habitat requirements of this species are taken into account in relevant development policies, plans and proposals, particularly in relation to river engineering.	X	X	X	✓	X

#### Examples of project work

- ERS surveys continued in Cornwall, Wales, North West and North East. Mostly targeted at Coleoptera, but some new Diptera records also received.
- R&D project for *Bembidion testaceum* commenced. First phase desk based.
- ERS group still largely inactive.

#### Agency contribution in 2003/4 = £15K

#### Action planned for 2004/5

- *Bembidion* R&D to be completed.
- Local surveys continuing and being developed.
- Further guidance on site quality and management to be produced.

## White-clawed crayfish - *Austropotamobius pallipes*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 52-53

Agency co-ordinator: Julie Bywater

Lead partner: David Rogers & Elizabeth Watson

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.3	The use of byelaws to control baiting with crayfish by anglers should be reviewed.	✓	X	✓✓✓	✓	✓
5.2.2	Ensure appropriate habitat management is undertaken.	✓	✓✓✓	✓	✓✓	✓
5.3.1	Establish the feasibility of eradicating non-native crayfish populations from the wild where they threaten sensitive sites or important populations of native crayfish.	✓✓	✓✓	✓✓	✓	✓
5.3.2	If feasible, instigate and support re-introduction programmes to selected areas.	✓	✓✓	✓	✓✓	✓
5.4.1	Provide advice for those involved in the conservation of this species and management of non-native crayfish populations.	✓✓	✓✓	✓✓	✓	✓
5.4.2	Provide advice on disinfection procedures to prevent the transmission of crayfish plague.	✓	✓	✓	✓✓	✓
5.5.1	Make inventories of SSSIs/ASSIs which contain native crayfish populations. Monitor populations in protected areas. Maintain the detailed databases on the distribution of the native and non-native crayfish.	✓✓	✓✓	✓✓	✓	✓
5.5.2	Investigate the potential for recovery of native crayfish in areas affected by crayfish plague, and the feasibility of re-introducing the species to these areas.	✓	✓	X	✓	✓
5.6.1	Increase public awareness of the presence of this species and the threats to its existence. Publicise the need for conservation and how the public can help.	✓✓	✓✓	✓	✓	✓
5.6.2	Ensure that anglers and visitors to nature reserves containing crayfish are made aware of the risks of spreading crayfish plague and of the legislative controls on the release of non-native species.	✓	✓	✓	✓	✓

### Examples of project work

- Agency staff attended an international Association of Astacology conference in London where ideas for conserving native crayfish and managing alien crayfish species were exchanged
- Proceedings from the Management and Conservation of Crayfish conference were published in May 2003, including range of peer-reviewed scientific papers.
- Agency contribution to European CRAYNET programme with attendance at the Killkenny meeting in Ireland.
- Various desk studies have been undertaken e.g. A review of angling and crayfish (Peay and Hiley, 2004) funded by Thames Region, Methods for long-term monitoring of the white-clawed crayfish populations in the R. Witham (Lincs) (D. M. Holdich) funded by Anglian Region.
- Surveys of crayfish populations have been proposed and funded by the Agency. e.g. R. Witham native crayfish distribution survey (D. M. Holdich) in Anglian Region, and R. Stour (signal and narrow-clawed crayfish) (Ros Wright), Southern Region - Kent rivers, A proposed survey of various catchments in West Area, North West Region - A proposed survey of the River Lune catchment in central area;
- Further investigation was undertaken into the effects of harvesting crayfish from the wild, and the impacts that signal crayfish are having on other flora and fauna to facilitate management of commercial fisheries for conservation. Studies into the impact of alien crayfish species have been undertaken in the River Lambourn in Thames Region (Helena Carey, placement student) and the Effects of trapping on signal crayfish in the R. Lee (David Rogers Associates).
- The report 'Evaluation of the capacity of pheromones for the control of non-native crayfish', project reference W1-070(1) undertaken jointly with English Nature was published

Agency contribution in 2003/4 = approximately £20k

**Action planned for 2004/5**

- Continue investigations in the potential for alternative means of eradicating alien crayfish species including the use of pheromones as attractants and repellents and investigate the possible use of male sterilisation techniques. Project W1-070, evaluation of the capacity of pheromones for the control of non-native crayfish (Jointly with English Nature).
- Investigate the potential for development of captive-rearing and re-introduction programmes
- Development of white-clawed crayfish Steering Group website ([www.crayweb.info/](http://www.crayweb.info/)) by Lead Partners David Rogers & Elizabeth Watson with financial contribution and assistance from Agency
- Further research on the impact of non-native crayfish on native flora and fauna is required.
- Further investigation into the effects of harvesting crayfish from the wild, and the impacts that signal crayfish are having on other flora and fauna to facilitate management of commercial fisheries for conservation. Investigate the population dynamics of alien crayfish species, their migratory patterns etc. to facilitate the search for a method of control or eradication.
- Agency contribution to European CRAYNET programme. Continue to work towards the creation of a definitive crayfish distribution database and routes for sharing information on crayfish distribution for conservation purposes within the UK and Europe.
- Include the spiny cheek and red swamp crayfish in schedule 9 of the Wildlife and Countryside Act, 1981 as pest species.
- Policy development to control the harvesting of alien crayfish from the wild through national byelaws.

## Southern damselfly - *Coenagrion mercuriale*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 54

Agency co-ordinator: Tim Sykes

Lead partner: The Wildlife Trusts

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Encourage the uptake of beneficial land management schemes on land adjacent to occupied sites, including design of drainage schemes and other agri-environmental measures.	✓✓	✓	✓	✓✓	✓
5.2.3	Ensure that, where possible, the hydrology of occupied sites remains favourable.	✓✓	✓✓	✓	✓	✓
5.4.1	Ensure relevant landowners, managers and all others involved in the management of sites which support the species are aware of its presence and rarity, and appropriate methods of habitat management for its conservation.	✓✓	✓✓✓	✓✓	✓✓	✓
5.5.2	Promote regular monitoring of extant sites, seeking to identify further threats to the species.	✓✓	✓✓	✓✓	✓✓	✓

### Examples of project work

- Collaborative work with a broad range of partners including RSPB, The Wildlife Trusts, National Trust, Local Authorities, CCW and EN. A strong focus upon habitat management of extant southern damselfly sites, and selected potential sites. Work was completed in Pembrokeshire, Gower, Anglesey, Dorset, Oxfordshire and Hampshire. Work involved fencing/grazing management, scrub clearance, ditch maintenance and water level management. Total costs exceeded £85K, with an Agency contribution of £38K.
- Ongoing research into the population biology and ecological requirements of the species. This includes work led by Liverpool University into the genetics of the southern damselfly, enabling an insight into the metapopulation dynamics of the species and assisting identification of potential sites. Other research includes the ongoing Ph.D. into the species in its chalkstream and fen habitats. The Agency contribution to the collaborative R&D amounted to £4K.

**Agency contribution in 2003/4 = c £42K**

### Action planned for 2004/5

- Replacement of sluice in lower Itchen valley by Flood Defence. Extant structure is dilapidated and in imminent danger of catastrophic collapse – which might starve the Itchen valley Country Park water meadows of water altogether or perhaps divert most of the River Itchen from its current course through the water meadows. Water level management is critical to the restoration and management of the site – a SSSI and cSAC supporting the strongest southern damselfly population outside of the New Forest and Mynydd Preseli. Replacing the new structure will cost in excess of £25K with c£19K from the Agency. Work is planned for October 2004.
- Completion of Ph.D, based at Liverpool University, on the ecology and habitat management requirements of the southern damselfly in its chalkstream and fen habitats. This research is jointly funded by CCW/EN, Liverpool University and the Agency. It has conducted the biggest ever programme of fieldwork dedicated to a damselfly in the UK. The project has been tremendously successful in terms of the potential academic outputs as well as lessons learnt for conservation of the species. Final years contribution to Ph.D.
- Publication of a report aimed at land managers, river keepers and the like, distilling the Ph.D. outputs down into practical land management advice. Due to the relative small number of relevant landowners/managers we might produce a site-specific advice note for each landowner rather than update the existing Biodiversity Technical Series leaflet.
- The Steering Group will hold its annual gathering in France during 2004. The Group normally meets over two days, with a day in the field visiting southern damselfly sites complimenting the formal meeting. The Group has visited nearly all of the UK southern damselfly sites, and in 2004 will hold its meeting in 'Parc Naturel Régional des Boucles de la Seine Normande', located just south of the Seine estuary, between Le Havre, Caen and Rouen. Part of the Regional Park is designated SAC with southern damselfly as an interest feature. The Group will meet with local academics and National Parc ecologists. Discussions will cover monitoring, practical habitat management, PR and awareness raising and research.

## Little whirlpool ram's-horn snail - *Anisus vorticulus*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 57

Agency co-ordinator: Juliette Hall

Lead partner: Environment Agency

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Identify water quality requirements and take account of these standards when setting standards in watercourses occupied by this species, seeking to restore clear, unpolluted water to ditches to provide opportunities for expansion or re-colonisation.	✓	✓	✓	✓	✓
5.2.2	Establish and implement a ditch management cycle that allows the recolonisation of cleaned stretches from adjacent sections, taking into account the length of rotation necessary to avoid the ditch becoming choked with emergent vegetation.	✓	✓	✓	✓	✓
5.2.3	Seek to ensure that WLMPs take into account the ecological requirements of this species, where appropriate.	✓	✓	✓	✓	✓
5.3.1	Following further research and monitoring, prepare advice on habitat management to favour this species, by the year 2000.	✓	✓	✓	✓	✓
5.4.1	Ensure that land managers are aware of the presence and vulnerability of this species, and appropriate methods of land and water management for its protection.	✓	✓	✓	✓	✓
5.5.1	Within a single season, undertake a survey of all post-1965 live recorded sites to establish an accurate distributional baseline for the species. Then monitor using fixed point monitoring stations at each of the existing sites.	X	X	X	X	✓
5.5.2	Promote further study on the ecological requirements of this species, including the effects of changes in water quality on survival and current management of habitats containing healthy populations.	X	✓✓	✓	✓✓	✓
5.5.3	Survey poorly recorded areas to discover if further colonies exist.	X	X	✓	✓	✓

### Examples of project work

- Collation of existing information on ditch management best practice.

### Agency contribution in 2003/4 = £0

### Action planned for 2004/5

- Baseline monitoring planned for 2004 at key sites within Sussex and East Anglia.
- Habitat management advice sheets to be produced for key ditch networks.

## Freshwater pearl mussel – *Margaritifera margaritifera*

Category: 2

Contact point: SNH

Focus on biodiversity page: 58

Agency co-ordinator: Anne Lewis

Lead partner: Environment Agency/SNH

Trend: ☉

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Identify water quality requirements for the species and seek to ensure that these form the basis for setting Statutory Quality Objectives, including Special Ecosystem Standards for sites occupied by the pearl mussel.	X	X	X	✓	✓
5.1.2	Seek to ensure that CAMs, flood defence activities, WLMPs and freshwater fisheries management take account of the requirements of this mussel, where populations still occur.	✓	✓	✓	✓	✓
5.1.3	Encourage favourable land management within catchments, where the river supports major populations of the mussel, through appropriate land management and grant schemes.	✓	✓	✓	X	✓
5.4.1	Provide advice to river land managers, water bailiffs and local police in relevant areas on the presence and legal status of this species, and appropriate methods of management for its conservation.	✓	✓	✓	X	✓
5.5.1	Identify catchments where there is the best chance of re-establishing this species.	✓	X	X	X	X
5.5.2	Carry out research to investigate key threats, fish hosts, life cycle and life history in different places, tolerance to variation in acidity, genetic variation, viability of re-seeding populations, and the effects of commercial exploitation.	✓	✓	X	✓	✓
5.5.3	Establish the current status of populations throughout the UK.	X	✓	X	✓✓	✓
5.5.4	Encourage regular monitoring of known populations and seek to identify further threats to the species.	✓	X	X	✓✓	✓
5.6.1	Promote awareness of the threats to the species and publicise the legal protection afforded to it.	✓	X	X	X	✓

### Examples of project work

- In June 2003 43 gravid female pearl mussels were collected from the North Tyne and taken to Kielder Hatchery where they were kept in a tank with 7,000 young salmon. The salmon were checked at intervals for signs that they had been adopted by the glochidea. Samples of wild fish from the North Tyne were also checked for glochidea to find the best habitat to release the host fish into the river. Unfortunately, these initial attempts at captive breeding were unsuccessful. However, many lessons were learnt, including new techniques in pearl mussel husbandry.

### Agency contribution in 2003/4 = £4K

### Action planned for 2004/5

- The above programme at Kielder hatchery is being repeated, with modifications in summer 2004.
- Possible expansion of captive breeding programme into other regions.
- Visit to a successful breeding programme in Northern Ireland by Agency staff.

## Glutinous snail – *Myxas glutinosa*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 59

Agency co-ordinator: Huw Jones

Lead partner: Environment Agency

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.1	Encourage good water quality in the catchment area of the Kennington Pit site.	X	X	X	X	✓
5.2.2	Implement the management plan for Llyn Tegid.	✓	✓	✓	✓	✓
5.5.1	Undertake ecological studies to provide a description of current and desired water quality and flow and the physical habitat.	X	X	X	X	✓
5.5.2	Survey all sites where the species has been recorded in the previous 50 years by 2000.			*	✓✓✓	✓
5.5.4	Continue monitoring existing populations.	X	✓✓✓	✓✓✓	✓✓	✓
5.5.7	Survey of lakes in the vicinity of Llyn Tegid to see if other populations exist locally.		*	X	✓✓✓	✓
5.5.8	Assess risks to the population in Llyn Tegid.	X	X	X	X	✓
5.5.9	Undertake ecological studies to provide a description of the current and desired water quality and flow regime and the physical habitat required by the species in the Llyn Tegid site.	X	X	X	X	X

\* Completed

### Examples of project work

- Advise landowners / managers within the Llyn Tegid catchment of the importance of the species.

Agency contribution in 2003/4 = £0K

### Action planned for 2004/5

- Actions for *Myxas glutinosa* have now been incorporated into the Environment Agency Wales (North Area) Biodiversity Action Plan which will play a pivotal role in determining priorities for the area FBR team.
- In conjunction with the Countryside Council for Wales and Snowdonia National Park Authority, arrange for a survey of Llyn Tegid to be carried out in 2005.
- Determine whether a ecological survey / re-survey of the Kennington Pit site is worthwhile.

## Fine-lined pea mussel - *Pisidium tenuilineatum*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 60

Agency co-ordinator: John Murray-Bligh

Lead Partner: Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.3	When ecological understanding is improved, consider the development of specific site designation to safeguard selected sites where the species is present or likely to recolonise. Management of water quality is likely to be required.	X	X	X	X	X
5.4.2	When ecological understanding is improved, consider the development of a set of management guidelines to be made available to local site managers/land owners and appropriate local authorities.	✓	X	X	X	X
5.4.3	Produce a short identification and background ecological leaflet for field workers and site managers to aid identification and help improve our knowledge of the species status and distribution.	✓✓	✓✓	✓✓	✓✓	✓
5.5.8	Exchange research and management information with European partners.	X	X	X	X	X
5.5.9	Undertake surveys of all historical locations within a single season to discover whether populations still remain in any of them.	✓✓	✓✓	✓✓	✓✓	✓
5.5.11	Plan and undertake periodic monitoring of populations, adopting standard practices, at selected sites in order to identify population trends and potential threats.	✓	✓	✓	X	X
5.5.12	Undertake further ecological research which may be undertaken partly in co-operation with European partners.	X	X	X	X	X
5.6.2	Consider promoting awareness of the situation regarding this species if early research suggests that a threat exists to the species.	X	X	X	X	✓

### Examples of project work

- Work towards publishing the two documents below.

### Agency contribution in 2003/4 = £4K

### Action planned for 2004/5

- Publication of 'Freshwater Bivalves of Britain and Ireland'.
- Publication of Technical Report 'Further surveys to elucidate the distribution of the fine-lined pea mussel *Pisidium tenuilineatum* Stelfox, 1918'.
- Review and plan next stage.



## Depressed river mussel - *Pseudanodonta complanata*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 61

Agency co-ordinator: Francis Farr-Cox

Lead partner: Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Consider developing policy and legislation to ensure favourable biotic conditions are maintained at key sites	✓	✓	X	✓	✓
5.5.1	Undertake studies to identify the ecological requirements of this species.	✓✓✓	✓	✓	✓✓	✓
5.5.2	Carry out surveys to establish the distribution of the species and location of key populations by the year 2000.	*	✓	X	✓✓	✓

\* Completed

### Examples of project work

- Microhabitat investigations on a reach of the River Brue. Preliminary Ph.D work to investigate the effect of routine weedcutting methods on macroinvertebrates including the depressed river mussel.
- Work on depressed river mussel population distribution on the navigable reach of the River Medway and the impact of routine winter drawdown there.

**Agency contribution in 2003/4 = £15K**

### Action planned for 2004/5

- Continuation of Ph.D project.

## Shining ram's-horn snail - *Segmentina nitida*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 62

Agency co-ordinator: Shelagh Wilson

Lead partner: Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Seek to maintain favourable water quality at current occupied, and any newly discovered sites.	✓	✓	✓	✓✓	✓
5.2.2	Develop a ditch management cycle that allows the re-colonisation of cleaned stretches from adjacent sections.	✓	X	✓	✓✓	✓
5.4.1	Produce land and water management guidelines for site managers and land owners by the year 2000.	X	✓	✓	✓	✓
5.5.1	Undertake a survey of all post- 1950 sites by the year 2000, to establish the current distribution of the species.			*	✓✓	✓

\* Completed

### Examples of project work

- Day job only

Agency contribution in 2003/4 = £0.5K

### Action planned for 2004/5

- Survey for BAP snails at sites not recently surveyed, confirm presence/absence at known and former sites in Essex and Norfolk. Will enable management plans to be formulated.
- Survey for all BAP snails on the Blyth estuary, will improve knowledge of distribution.
- Broadland Flood Alleviation Strategy, habitat creation for BAP snails. Widening 12km of grazing marsh dykes by adding a berm or weed fringe. Will be carried out in Halvergate and Haddiscoe Island compartments.
- Completion of Open University Ph.D., based on Somerset levels.

## A freshwater bryozoan – *Lophopus crystallinus*

Category: 1

Contact point: Environment Agency

Focus on biodiversity page: 63

Agency co-ordinator: Daryl Buck

Lead partner: Invertebrate Action

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Address the requirements of this species in the LEAP process and in relevant WLMPs.	X	X	X	X	X
5.1.2	Take account of the species' requirements in response to applications for water abstraction.	✓	✓	X	X	X
5.2.1	By 2004, reduce water abstraction from Barton Blow Wells aquifer and Breck aquifers.	X	X	X	X	X
5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation.	✓	X	X	X	X
5.5.2	Conduct targeted autecological research to inform habitat management.	✓✓	✓✓	X	X	X
5.5.3	By 2000 start long-term surveillance of one or more populations, possibly using artificial substrata to allow quantitative population studies, in order to study natural fluctuations in population size.	✓✓	✓✓	X	X	X

### Examples of project work

- Agency contribution towards Ph.D looking at the autecological needs of the species in order to inform habitat management.
- As part of the Ph.D, surveillance of existing known populations is ongoing. Looking at flood debris for the presence of statoblasts ('spores') has identified at least one other previously unknown population in Sussex.

**Agency contribution in 2003/4 = £2.5K**

### Action planned for 2004/5

- Action 5.1.1 will be revised in the Defra Targets Review - there are no applicable WLMPs for this species and LEAPS are now obsolete.
- There is a review of the current Anglian Water abstraction licence (the major abstraction affecting the species) forthcoming and the species' requirements will be looked into during the review.
- Make sure landowners for the major populations are aware of their presence and have copies of the species dossier, indicating threats and management issues.

## Ribbon-leaved water plantain – *Alisma gramineum*

Category: 1

Agency co-ordinator: Gill Walters

Contact point: Environment Agency

Lead partner: Environment Agency/English Nature

Focus on biodiversity: page 64

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Identify water quality requirements which will maintain population levels at all known sites, and use these as a basis for setting standards.	✓	X	X	✓✓	✓
5.5.1	Investigate the source of enrichment at the Worcestershire site and monitor water quality at all extant sites.	✓	X	X	✓	✓

### Examples of project work

- Continuation of annual surveying of sites.
- Continuation of work to study ecological requirements of plant.
- Identifying and assessing suitable sites for re-introduction of plants.

### Actions by other organisations

- English Nature have drawn up management agreement with owners at Westwood Pool.
- Assessed feasibility of modifying outlet structure at Westwood Pool.
- Plants grown in deep water conditions.

**Agency contribution in 2003/4 = £5K**

### Action planned for 2004/5

- Continuation of ongoing work.

## Cut grass – *Leersia oryzoides*

Category: 2

Contact point: English Nature

Focus on biodiversity: page 65

Agency co-ordinator: Vacant

Lead partner: Environment Agency

Trend: ☺

UK BAP Number	Action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.3	Ensure that land drainage work does not take place in the vicinity of extant wet grassland populations.	X	X	X	X	X
5.2.4	Ensure that watercourse management programmes at sites for cut-grass fully take into account the requirements of the species.	X	X	X	X	X
5.2.5	Ensure that Local Environment Agency Plans and Water Level Management Plans take full account of the requirements of this species.	X	X	X	X	X
5.2.6	Prepare watercourse management plans for all SSSIs with extant populations of cut-grass.	X	X	X	X	X
5.4.2	As far as possible, ensure that all relevant agri-environment project officers, relevant drainage engineers and waterways managers are advised of locations of this species and its management requirements.	X	X	X	X	X

### Examples of project work

None

### Agency contribution in 2003/4 = £0

### Action planned for 2004/5

None

## Triangular clubrush - *Schoenoplectus triqueter*

Category: 2

Contact point: English Nature

Focus on biodiversity page: 66

Agency co-ordinator: Paul Smith

Lead partner: Environment Agency

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.1	Where possible, minimise hard engineering of river channels along which this plant has been recorded and continue to develop alternative river management techniques. Particularly for the Rivers Arun, Medway and Tamar.	X	✓	X	✓	✓
5.2.2	Ensure that future habitat management within the River Tamar SAC is appropriate to the needs of this species.	X	X	X	✓	✓
5.5.1	Undertake a survey of the Rivers Tamar, Medway and Arun to look for any unrecorded clumps of triangular club-rush and to identify any suitable sites from re-introduction.	*	*	*	✓✓✓	✓
5.5.2	Undertake annual monitoring of the last remaining extant population and of any newly re-established populations.	✓	✓	✓✓✓	✓✓	✓
5.5.3	Assess the feasibility and desirability of deflecting the eroding force of the river away from the single extant population on the River Tamar.	N/A	N/A	N/A	X	X
5.5.4	Carry out a full autecological assessment of this species with a view to refining conservation action. Including investigations into the reason for its decline and identifying any threats.	X	X	X	✓✓	✓
5.5.5	Investigate seed production in triangular club-rush.	X	X	X	✓	✓
5.5.6	Consider investigating the impacts of nutrient enrichment and pollution on populations of triangular club-rush and consider the value of buffer strips alongside water courses in the vicinity of key sites.	X	X	X	X	X
5.6.1	Develop links with botanists in Ireland and elsewhere in Europe in order to understand the species biology and preferred conditions.	*	*	*	✓✓✓	✓

\* Completed

### Examples of project work

- Ongoing monitoring and reporting on Tamar population.

### Agency contribution in 2003/4 = Staff time only

### Action planned for 2004/5

- Ongoing monitoring and reporting on Tamar population. Reacting to any significant change as required.

## Greater water parsnip - *Sium latifolium*

Category: 2

Contact point: English Nature

Focus on biodiversity page: 67

Agency co-ordinator: Lesley Saint

Lead partner: Environment Agency

Trend: ☹

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Promote the restoration of more natural river dynamics on lowland rivers in Britain, including the restoration of alluvial floodplains, in order to create permanent or semi-permanent water habitats for this species.	✓	✓	✓	X	X
5.2.2	Ensure that LEAPs and WLMPs take full account of the requirements of this species.	X	X	X	X	X
5.2.3	Where possible, seek beneficial management for this species at extant sites. Ditches should not be cleaned out too regularly and sites should not be heavily grazed.	X	X	✓	✓	X
5.6.1	Use the conservation of greater water parsnip to help illustrate the need to develop natural river and flood dynamics for biodiversity.	X	X	✓	X	X

### Examples of project work

- Work is on-going with partners in BAP partnerships, The Wildlife Trusts and local councils.

### Agency contribution in 2003/4 = unknown

### Action planned for 2004/5

- A small steering group and work plan is in the process of being developed. There have been two preliminary meetings between the Agency and English Nature to determine the actions required. For 2004/5 the details of the key contacts likely to have information for greater water parsnip will be collected. Following on from this the group has identified the need for a desk study to be undertaken on a project basis to collate all the existing information on the species during winter 2004/5. The desk study is funding dependant. In future years it is hoped to develop a PhD project to determine the requirements of greater water parsnip, but in the light of the rapid decline interim best management guidelines need to be produced.

NB Recent analysis of *Sium latifolium* data has shown that this is the 7<sup>th</sup> fastest declining species in England. (C.D. Preston, M.G.Telfer, H.R. Arnold & P. Rothery (2002). The changing flora of Britain, 1930-99. In: C.D. Preston, D.A. Pearman & T.D. Dines. New Atlas of the British and Irish Flora).

## Multi-fruited river moss – *Cryphaea lamyana*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 68

Agency co-ordinator: Jonathan Burgess

Lead partner: Plantlife

Trend: ☺

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Ensure that the requirements of this species are considered when developing Water Catchment Management Plans/Local Environment Agency Plans (LEAPs) for rivers where this species occurs.	X	X	✓	X	X
5.4.1	Advise all relevant Environment Agency staff and agri-environment scheme project officers working in south-west England and Wales of the locations of this species, its importance, and measures needed to ensure its conservation. They should be told of the need to avoid felling host trees and dumping dredgings on colonies of this species.	✓✓	X	✓	X	X

### Examples of project work

- Publication of jointly funded English and Bilingual awareness raising leaflet.
- Jointly funded MSc project in conjunction with Plymouth University to look at habitat requirements of *Cryphaea lamyana*.

Agency contribution in 2003/4 = £2.5K

### Action planned for 2004/5

- Continue funding of M.Sc as above.



## Tiny fern-moss – *Fissidens exiguus*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 69

Agency co-ordinator: Edward Bradbrook

Lead partner: Plantlife

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.3	On streams with populations of tiny fern-moss, ensure that existing stream discharges and water quality are maintained.	X	X	X	X	X
5.2.5	Where possible, ensure that waterside trees are not removed from alongside those parts of streams with populations of tiny fern-moss.	X	X	X	X	X
5.4.2	Ensure that relevant waterway managers and agri-environment project officers are advised of locations for this species, its importance and the management needed for its conservation.	X	X	X	X	X

### Examples of project work

None

### Agency contribution in 2003/4 = £0

### Action planned for 2004/5

None

## Water rock bristle - *Seligeria carniolica*

Category: 1

Agency co-ordinator: Jim Heslop

Contact point: Environment Agency

Lead partner: Plantlife

Focus on biodiversity: page 70

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.3	Ensure that water quality and natural seasonal flow rates are maintained at the known site where this species occurs.	✓	✓	✓	✓	✓

### Examples of project work

- Ongoing site characterisation and monitoring.

Agency contribution in 2003/4 = <£2k

### Action planned for 2004/5

- Continue to ensure that maintenance of existing site condition is the primary factor in determining any authorisations or activities that could affect the site.
- Further monitoring and site characterisation report to partners.

## Beaked beardless moss - *Weissia rostellata*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 71

Agency co-ordinator: Martin Christmas

Lead partner: Plantlife

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.3	On sites where the moss is thriving, ensure that current management practices (especially water level management) are continued. On other sites where it has declined, undertake experimental management with the aim of enhancing the populations.	x	X	X	X	X
5.2.5	Where relevant, ensure that extant sites for the species are not threatened by land drainage activities or through increases in water abstraction. The requirements of this species should be considered when setting limits on water abstraction.	✓	X	X	X	X
5.4.2	Ensure that all relevant people are advised of locations of this species, its importance and management needed for its conservation.	✓✓	X	X	X	X

### Examples of project work

- Surveys carried out in conjunction with violet crystalwort.
- Species considered in all relevant permissions and consents in Ridings Area.

### Agency contribution in 2003/4 = Staff time

### Action planned for 2004/5

- Surveys of Pennine reservoir shorelines, minimum 5 days work
- Training course for Agency staff increase survey effort

## **Violet crystalwort – *Riccia huebeneriana***

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 72

Agency co-ordinator: Debbie Cousins

Lead partner: Plantlife

Trend: ?

UK BAP Number	UK BAP Agency needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.4	Ensure that the habitat quality of extant sites is not adversely affected by land drainage activities	✓	X	X	X	X

### **Examples of project work**

- Biodiversity staff in the Dales Area of North East Region carried out a survey in October 2003 for certain bryophyte species, including violet crystalwort. The survey was concentrated on the sites where historical data, mostly collected in the 1970s, was already held. As a result of this work they were able to support the historical records of violet crystalwort reported at Gouthwaite reservoir on the River Nidd after finding healthy colonies of the species. Two new previously unrecorded sites for the species were also found at Fewston reservoir on the River Wharfe and Lumley Wood reservoir on the River Laver.

**Agency contribution in 2003/4 = Staff time only.**

### **Action planned for 2004/5**

None planned.

# Five stoneworts (*Chara connivens*, *Nitella gracilis*, *Nitellopsis obtusa*, *Tolypella intricata*, *Tolypella prolifera*)

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 73-74

Agency co-ordinator: Debbie Cousins

Lead partner: Plantlife

Trend: ☺

## *Chara connivens*

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Ensure that the LEAP process and Water Level Management Plans take full account of the requirements of this species. The findings of 5.5.3 should be used to set water quality objectives and nutrient standards within these plans.	✓	X	X	X	X
5.2.4	Devise and implement measures to minimise the threats of boat traffic wash and, depending on the results of 5.5.3, phosphate pollution.	X	X	X	X	X
5.5.4	Commission research into the possibility of salinity levels rising in the Norfolk Broads as influxes of sea water become more frequent as a result of sea-level rise. The research should consider the need for measures to ensure that salinity levels do not increase further.	X	X	X	X	X

## *Nitella gracilis*

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.4	Promote schemes which facilitate the development of buffer strips along water-courses feeding into sites and around the edges of sites, where this will help to reduce pollution from agricultural run-off.	✓	X	X	X	X

## *Nitellopsis obtusa*

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Review/establish water quality objectives and associated nutrient standards at all of the extant starry stonewort sites taking into account the requirements of this and other threatened aquatic species	X	X	X	X	X
5.2.3	Depending on the results of 5.5.3, devise and implement measures to minimise the threats of boat traffic wash and phosphate pollution.	X	X	X	X	X

## *Tolypella intricata*

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.2.5	Ensure that Local Environment Agency Plans and Water Level Management Plans take full account of the requirements of this species. In particular, ensure that no further tassel stonewort sites are lost through increases in levels of water abstraction. This action should take account of the research outlined under 5.5.5.	✓	✓	X	X	X

***Tolypella prolifera***

No actions

**Examples of project work**

- Continuation of Agency funded Ph.D at University of East Anglia (R&D Project: W1-088/1, Identification of key parameters limiting stonewort (charophyte) survival).

**Agency contribution in 2003/4 = £12K**

**Action planned for 2004/5**

- As above

## River jelly lichen - *Collema dichotomum*

Category: 1

Contact point: Environment Agency

Focus on biodiversity: page 75

Agency co-ordinator: Marlynne Good

Lead Partner: Environment Agency

Trend: ?

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Seek to eliminate the risk of water pollution, eg through the provision of advice on farm management where this species occurs.	✓	X	✓	✓	✓
5.2.2	Ensure that LEAPs adequately reflect the water quality and quantity requirements for the river jelly lichen.	✓	✓	✓	✓	✓
5.3.1	Following feasibility studies and identification of appropriate sites, seek to restore 5 populations to unoccupied sites when suitable conditions have been provided.	X	X	X	X	X
5.4.1	Ensure land managers adjacent to extant sites, local planning authorities and water management authorities are aware of the presence, legal status and threats to the species and its community, and the importance of its conservation.	✓	X	X	X	X
5.5.1	Undertake survey of potential sites to establish the distribution of the species.	X	X	✓	✓	✓
5.5.2	Encourage research into the ecological requirements of the species to determine the optimum conditions for growth and the feasibility of re-introduction.	X	X	X	✓	✓
5.5.3	Investigate further the effects of eutrophication and acidification of streams on this species and seek to reverse the impacts.	X	X	X	X	X
5.5.4	Establish a protocol for regular monitoring of this species and the water quality in the vicinity of known sites.	✓	X	✓✓	✓✓	✓

### Examples of project work

- Desk study of the ecology of river jelly lichen.
- Information leaflet published for distribution to landowners, local authorities etc.
- Some progress made towards developing a monitoring method for the species.

**Agency contribution in 2003/4 = approx. £4.5K**

### Action planned for 2004/5 (*pending funding*)

- Carry out surveys at sites for which records exist to confirm species presence/absence/misidentification.
- Carry out some experimental work to establish the effects of siltation on the species.

## Aquifer-fed naturally fluctuating water bodies

Category: 1

Lead Agency: Environment Agency

Trend: ☺

Agency co-ordinator: Pat Sones

Focus on biodiversity: page 76

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Ensure that water abstraction and groundwater protection policies take into account the specific requirements of aquifer fed naturally fluctuating water bodies and where necessary introduce new controls.	✓	✓	✓	✓	✓
5.1.2	Ensure that fishery policy recognises the need to prevent introductions of fish to these water bodies.	✓	X	X	X	X
5.1.3	Consider the designation of a Water Protection Zone to safeguard water quality in the Breckland Meres.	X	X	X	X	✓
5.2.1	Bearing in mind the possible effects of climate change, continue to review the use of water resources in the area affecting the hydrological balance of the Breckland meres. In the light of the monitoring programme (see 3.2) set consent levels and regimes for abstraction, which are compatible with maintaining the maximum nature conservation interest of the meres.	✓	✓	✓	✓✓	✓
5.2.2	Establish water quality objectives and associated nutrient standards for turloughs and Breckland meres by 2002 and aim to meet these targets by 2010.	X	X	X	X	X
5.2.4	Ensure that all SSSI/ASSI water bodies in this category have site management plans implemented by 2004, bearing in mind that activities well outside the SSSI/ASSI boundaries may affect the water bodies. Where necessary, offer long-term management agreements to protect these sites.	X	X	X	X	X
5.2.8	Contribute to the implementation of relevant species action plans for rare and declining species associated with aquifer fed naturally fluctuating water bodies in conjunction with the relevant species steering group.	✓	✓	✓	X	X
5.3.1	Continue to advise Government and landowners on measures to safeguard this fragile habitat.	✓	✓	✓	✓	✓
5.4.1	Contribute to knowledge of the status and importance of naturally fluctuating water bodies and of their effective management, by exchanging information gained in the UK with colleagues in other countries that contain similar sites.	X	X	X	X	✓
5.5.1	Carry out research to clarify the impacts of water abstraction, forestry and climate change on the hydrological regime of the Breckland meres. In particular, undertake groundwater modelling to increase understanding of the hydrological mechanisms in the aquifer and meres. Report on this by 2003.	✓✓	✓✓	✓✓	✓✓	✓
5.5.2	By 2000 characterise the quality of the groundwater supplying turloughs and the Breckland Meres.	X	X	X	X	X
5.5.4	Devise and initiate methods of biological and hydrological monitoring for all known aquifer fed naturally fluctuating water bodies by 2000. By 2015 consider whether, in the face of climate change, these sites are viable in the long term.	✓	✓	X	X	✓
5.5.7	Contribute information to a World Wide Web based catalogue of survey information as a means of improving access to information on aquifer fed naturally fluctuating water bodies.	X	X	X	X	X

### Examples of project work

- For the turlough in Wales, Pant-y-llyn at Carmel, the Agency has produced an action plan (2003-2007) to achieve the actions that the Agency has responsibility for delivering. There is a procedure in place to ensure that fish stocking is not permitted. Work is at the planning stage to design and introduce an abstraction zone of influence for the site.
- For the Breckland Meres in Norfolk, the Agency has produced (currently in draft form) the County HAP for Aquifer Fed Naturally Fluctuating Water Bodies, as part of the suite of County LBAPs.



- Many of the actions for the HAP in Norfolk, the Breckland Meres, will be delivered through a major groundwater investigation and modelling project for the Chalk aquifer in Norfolk and Suffolk (Ely Ouse Groundwater Project). The aim of the project is to understand and quantify the groundwater resources of the area, and provide guidance on the management of the groundwater, and the river that interact with groundwater, in an integrated and sustainable way. The project started in 1998.
- During 2003-04, Phase 2 of the Ely Ouse Groundwater Project, which comprises the detailed conceptual understanding of the Ely Ouse catchment and calibration and verification of the groundwater model, was completed.

**Agency contribution in 2003/4 = Information not available**

**Action planned for 2004/5**

- For Pant-y-llyn in Wales, continuing the work to design and introduce an abstraction zone of influence for the site.
- For the Breckland Meres, Phase 3 of the model will commence<sup>1</sup> which will include predictive scenarios of abstraction and the effect on the Meres. The results will be used for the Appropriate Assessment of the site in the Habitats Directive Review of Consents, which needs to be completed for the 2 SSSI (East Wretham Heath, Stanford Training Area) in the Breckland cSAC by March 2006.
- Completion of the Norfolk County HAP for Aquifer Fed Naturally Fluctuating Water Bodies, as part of the suite of County LBAPs. Prepare an Agency plan for actions that we have responsibility for delivering or supporting other organisations to deliver.

## Chalk rivers

Category: 1

Lead Agency: Environment Agency

Trend: ☹

Agency co-ordinator: Lawrence Talks

Focus on biodiversity: page 77

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Review abstraction licences during LEAP production. Where abstraction is found to be damaging the quality of the chalk river habitat, consider amending or revoking the licence.	✓	✓	✓	✓	✓
5.1.3	Review licences for industrial/effluent discharge where these are found to damage the quality of chalk rivers.	✓	✓	✓	✓	✓
5.1.4	Seek to ensure that the environmental impact of development adjacent to and/or directly impacting on chalk rivers is minimised, particularly for SSSI and SAC chalk rivers.	✓	✓	✓	✓	✓
5.2.3	Develop conservation strategies for chalk rivers.	✓	✓	✓	✓	✓
5.2.4	Schemes to encourage sympathetic management of catchments and river corridors should be reviewed by 2000 and extended where appropriate in order to reduce the run-off of silt and enhance wildlife habitats.	✓	✓	✓	✓	✓
5.2.5	Water quality on SSSI rivers should be assessed against proposed Special Ecosystem Statutory Water Quality Objective targets and problem sources identified. Significant pollution on other rivers should be assessed. A plan for remedying water quality problems should be drawn up for each SSSI river by 1998 and the remaining chalk rivers by 2002. Where phosphate removal is required at sewage treatment works on SSSI rivers, it should be installed by 2000.	✓	✓	✓	✓	✓
5.3.1	Promote advice on the best approaches to river corridor and catchment management.	✓	✓	✓	✓	✓
5.5.1	Assess the nature conservation value and potential for restoration of chalk rivers other than those, which are SSSI/cSAC by 2001.	✓	✓	✓	✓	X
5.5.2	The feasibility of restoration on stretches of modified small chalk rivers should be established by 2001 using experimental approach to assess the wider applicability of physical restoration techniques.	✓	✓	✓	✓	✓
5.5.3	Initiate a study investigating the beneficial impact of the management of chalk rivers and adjacent land use on the aquatic plants and animals.	✓	✓	✓	✓✓✓	✓

### Examples of project work

- Finished writing *The State of England's Chalk Rivers* report (see action planned for 2004/5).
- Phosphate removal. The UK BAP is being used as an important driver to secure investment to improve sewage treatment work effluent discharges on a number of chalk rivers under AMP4.
- A number of Catchment Abstraction Management Strategy (CAMS) have now been published or are near publication for chalk rivers these include: East Hampshire (includes River Meon in Hampshire (Southern)), the Stour (Southern), the Loddon (Thames), the Kennet and Pang (Thames) and the Dorset Stour (S. Wessex).
- The River Itchen Sustainability Study, a partnership between the Agency and the Water Companies with funding from AMP3, is at the cutting edge of chalk river catchment management alongside the River Avon LIFE Project. For more information see [www.riveritchensustainability.org.uk](http://www.riveritchensustainability.org.uk).
- The River Avon candidate SAC Conservation Strategy provides a framework for protecting and enhancing the interest features of the river. The Environment Agency and English Nature in partnership with representatives of riparian owners, fisheries interests, The Wildlife Trusts, water companies and local authorities developed the strategy. It was funded under the LIFE in UK Rivers Project. A £2 million LIFE-Nature and Heritage Lottery Fund bid to carry out strategic river restoration of the river Avon and its flood

plain working closely with local communities has been put together. The project title is River Avon And Valley Initiative. ([www.english-nature.org.uk/lifeinukrivers](http://www.english-nature.org.uk/lifeinukrivers)).

- The National Environmental Research Council's LOWland CAatchment Research (LOCAR) programme will undertake detailed research into the storage-discharge cycle of groundwater-dominated aquatic habitats in three chalk catchments – the Frome/Piddle in Dorset, and the Pang and Lambourn in Berkshire. The programme will improve understanding of geological, hydrological and ecological interactions within the catchment systems. The programme is a collaboration between universities, research institutes and user groups, such as regulators and water companies. The required instrumentation has now been installed (<http://www.nerc.ac.uk/funding/thematics/locar>)
- The Chilterns Chalk Rivers Project aims to conserve and enhance all major chalk streams in the Chilterns Area of Outstanding Natural Beauty. The project provides advice to landowners and managers on riverside management, carries out practical work to enhance the streams for wildlife, undertakes surveys of rare species and provides educational material for schools. Events have included organising the Chilterns Water Festival, and opening walks such as the Alban Trail.
- The Wessex Chalk Rivers Project's focus is on river enhancement and the management of the River Avon and its tributaries, the Wylde, Nadder, Bourne and Till. Project partners include the Environment Agency, Wiltshire Wildlife Trust, English Nature, Wiltshire Fishery Association and Wessex Water. A newsletter is produced.
- The Upper River Kennet Rehabilitation Project, designed to rehabilitate 10km of chalk river has now been completed. Work has included extensive narrowing, installation of deflectors to re-energise the flow and gravel reinstatement. Partners include Thames Water, Environment Agency and English Nature.
- More detail of these and many other projects on chalk rivers can be found in *The State of England's Chalk Rivers*, see below.

#### **Agency contribution in 2003/4 = >£1.5 million**

#### **Action planned for 2004/5**

- Publication of *The State of England's Chalk Rivers* report. This sets out the state of England's chalk rivers, describes the pressures that they are under and puts forward an agenda to protect and enhance our chalk rivers for the future.
- Following successful funding from the Heritage Lottery Fund develop projects for significant 6 figure funding from national and international funding partners for the Itchen Navigation (Hampshire) and the River Avon (Hampshire/Wiltshire).
- Launch the "Cinderella" Chalk Streams Project that is a national project between the Environment Agency and the Wild Trout Trust.
- Establish a national chalk river web site.

## Coastal saltmarsh

Category: 1

Lead Agency: Environment Agency

Trend: Ⓢ

Agency co-ordinator: Brian Empson

Focus on biodiversity: page 79

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.3	Promote awareness and uptake of agri-environment schemes which involve the management and creation of saltmarsh.	✓✓	✓✓	✓	✓✓	✓
5.1.4	Take account of available mechanisms for the management and creation of saltmarsh when developing Shoreline Management Plans and strategies for the management of coastlines.	✓✓✓	✓✓	✓	✓✓	✓
5.1.5	Initiate the preparation of strategic flood defence management plans in estuaries by 2003 which determine what could be achieved in terms of saltmarsh creation.	✓✓✓	✓✓	✓	✓	X
5.1.6	Investigate opportunities to incorporate the non-use value of saltmarsh into flood defence schemes.	✓	✓	✓	✓	X
5.2.2	Ensure that coastal defence or other construction works avoid any disruption of natural processes which might lead to the loss of saltmarsh.	✓✓	✓✓	✓	✓✓	✓
5.3.1	Promote and develop demonstration sites for the management and creation of saltmarsh and disseminate results.	✓✓✓	✓✓✓	✓✓	✓	✓
5.3.2	Encourage the appropriate management of saltmarsh through the production and dissemination of guidance material by 2005.	✓✓	✓	✓	✓	X
5.3.3	Establish a technical expert group by 1999 to collate and disseminate information relating to the relationship between saltmarsh, nature conservation and flood defence.	*	✓✓✓	✓✓✓	✓✓✓	✓
5.3.4	Make use of the potential provided by existing estuary management partnerships in taking forward the actions of this plan.	✓✓	✓	✓✓	✓✓	✓
5.3.6	Implementation groups for relevant HAPs should be advised on how to make appropriate provision for compensatory habitat creation.	✓	✓✓	✓✓	✓✓	X
5.5.1	Put measures in place to clarify the current and future rates of saltmarsh loss enabling a review of the targets of this plan by 2004.	✓✓	✓✓	✓✓	✓✓✓	X
5.5.3	Continue development of the use of remote sensing for monitoring soft coast habitats to determine the extent and rate of change, including the identification of the highest priority areas for saltmarsh creation.	✓	✓	✓✓	✓✓	X
5.5.4	Investigate the beneficial use of fine dredged materials for promotion of saltmarsh accretion and disseminate the results.	✓	✓✓✓	✓✓	✓✓	✓
5.5.5	Continue research in to the factors influencing the establishment of saltmarsh vegetation, and use this to develop 'best practice' methods for management.	✓✓	✓✓✓	✓✓	✓✓	✓
5.5.6	Undertake research on estuary dynamics, including the effects of sediment removal in relation to its impact on saltmarsh.	✓	✓✓	✓✓	✓✓	✓
5.6.1	Raise public awareness of the essential mobility of saltmarsh and its value for a variety of interests including coastal processes, flood defence, fisheries, nature conservation, amenity and recreation.	✓✓	✓✓	✓	✓	X

### Examples of project work

- Good progress has been made during 2003 on the estuary-wide Shoreline Management project for the Humber Estuary. At Paul Holme Strays, formerly known as Thorngumbald, which involves the realignment of some 80ha of arable land, the existing line of defences was breached at the end of summer 2003.
- Progress is underway on preparing the next setback site on the Humber, Alkborough. It is planned to create 400Ha of habitat, the majority of which will be saltmarsh and mudflats. Detailed studies are ongoing to determine where to breach the banks and how best to manage the site for wildlife. Breaching of the site is expected in 2006.

- At the Wash Banks site at Freiston Shore, situated in the Wash near Boston, where 78 Ha of saltmarsh habitat is being created, when the breach of the bank occurred in September 2002. Monitoring is continuing to demonstrate the success of the site in terms of provision of flood defence and enhancement for biodiversity. The whole of the realignment area was colonised with saltmarsh species within the first year, with 11 saltmarsh species and associated invertebrates identified.
- The Environment Agency and Defra Flood Management Research programme includes several projects for disseminating guidance on managed realignment and habitat creation. A Saltmarsh Management Manual, CIRIA guidance on managed realignment, Monitoring protocols and Measures of Habitat Quality and Suitability Criteria for Habitat Creation are expected in the autumn of 2004.
- Defra are funding a research project into large-scale use of muddy dredged material for sustainable flood management and habitat management. This project includes field trials and the production of a best practice manual.
- A joint report by the Environment Agency and RSPB on Regulated Tidal Exchange was completed in 2003. The report highlights the importance of this technique in creating saltmarsh and mudflats. Work is underway to identify a trial site in Anglian Region.

**Agency contribution in 2003/4 = £575,000 – both saltmarsh and mudflats**

**Action planned for 2004/5**

- Regional Habitat Creation Programmes in Anglian and Southern Region
- Production of guidance for Shoreline Management Plans
- Development of estuary strategies in Essex and Suffolk
- Development of Rye Harbour Farm, purchased for compensatory habitat, to include future creation of saltmarsh

## Eutrophic standing waters

Category: 1

Lead Agency: Environment Agency

Trend: Ⓢ

Agency co-ordinator: Simon Leaf

Focus on biodiversity: page 80

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	By 1999 establish agreed criteria to identify Tier 1, Tier 2 and Tier 3 eutrophic standing waters. By 2002 produce a list of sites comprising Tiers 1 and 2.	✓✓	✓✓✓	✓✓✓	✓	✓
5.1.2	By 2005 establish site-specific plans to achieve appropriate water quality, water resource use, fishery management and biological status for all important (Tiers 1 and 2) eutrophic standing water bodies. Within these tiers, assign priorities to the sites according to threat, vulnerability, potential for restoration and nature conservation interest. Issues raised in England and Wales to be addressed principally through LEAPs.	✓	✓	✓	✓	✓
5.1.3	Develop an integrated national approach to measuring environmental change in eutrophic waters and to solving problems affecting these habitats and resources.	✓✓	✓✓	✓✓	✓✓	✓
5.1.4	Seek to ensure that phosphorus stripping is instituted on all sewage works serving population equivalents of over 10,000 within designated sensitive areas (as specified in the EC Urban Waste Water Treatment Directive), where this would contribute to the control of pollution in eutrophic standing waters. Carry out a review of the sensitive areas, make further appropriate designations and implement the required measures by 2004.	✓	✓	✓✓	✓✓	✓
5.1.5	Consider modifying and expanding agri-environment measures further to protect eutrophic standing waters from agricultural contaminants. Produce any proposals by 2000.	✓	✓✓	✓✓	✓	X
5.1.6	By 2005 complete a review of the effectiveness of existing measures to control diffuse-source pollution, and where necessary introduce new controls.	✓✓	✓✓	✓✓	✓	✓
5.1.7	By 2005 complete a review of the effectiveness of existing measures to revoke existing damaging abstractions and if necessary introduce new controls.	✓✓	✓	✓	✓	✓
5.1.10	Review the efficacy of legislation on fish introductions and fishery management, particularly in relation to bottom-feeding fish and high stocking densities.	X	X	X	X	✓
5.2.1	By 2005 embark upon a nationwide programme of nutrient control, targeting sites in priority order according to the strategy in Section 4. Aim to maintain the condition of all Tier 1 eutrophic standing waters and to improve by 2020 the condition of at least 50% of Tier 2 sites. Continue the programme beyond 2020, to complete coverage of all Tier 2 sites.	✓	✓	✓✓	✓✓	✓
5.2.2	By 2004 complete the programme of notifying important eutrophic standing waters as SSSIs/ ASSIs. Prepare and where possible implement site management plans, taking special account of threats posed by pollution, water abstraction and recreational use.	X ✓	X	X ✓	X ✓	✓ ✓
5.2.3	Maintain or introduce appropriate fishery management. Where appropriate, institute restorative measures such as phosphorus control, biomanipulation and species reintroduction.	✓	✓	✓	✓	✓
5.2.4	Prepare and by 2010 implement catchment management plans for Tier 2 eutrophic standing waters which are not SSSIs or ASSIs.	X	X	X	X	X
5.2.8	Ensure that local planning mechanisms (e.g. Local	X	X	✓	X	✓

	Authority Structure Plans) take account of the wildlife interest of all (Tiers 1, 2 and 3) eutrophic standing waters.					
5.2.9	Contribute to the implementation of relevant priority species action plans for rare and declining species associated with eutrophic standing waters, in conjunction with the relevant species steering group.	X	X	X	X	X
5.3.1	Provide advice for managers and users of eutrophic standing waters, to promote the conservation of biodiversity in this habitat.	✓	✓	✓	X	✓
5.3.2	Promote best practice in farming and encourage farmers to prepare and implement farm waste management plans in catchments of vulnerable eutrophic standing waters.	✓	✓✓	✓	✓	✓
5.3.3	Develop guidelines for best practice in fishery management.	*	*	*	X	✓
5.4.2	Promote the interchange of information between the UK and other countries on management techniques, conservation and research relevant to eutrophic waters.	✓	✓	✓	✓	✓
5.5.1	By 1999 develop a rapid screening system to assess the biological quality of eutrophic standing waters, in order to classify them (see 5.1.1) as Tier 1, Tier 2 or Tier 3 and to determine priorities within these categories.	✓	✓✓	✓✓	✓	✓
5.5.2	By 2000 complete current work on the development and testing of a water quality classification of lakes and produce systems for assessing the degree of past change and for monitoring lake water quality. Apply these schemes to all Tier 1 and Tier 2 eutrophic water bodies.	✓✓	✓✓✓	✓✓	✓	✓
5.5.3	Continue to develop techniques of eutrophication risk assessment and to investigate means of controlling enrichment. Promote research into the role and transport of phosphorus and nitrogen in fresh waters and into the quantification of risks posed by diffuse-source pollution, including atmospheric nitrogen.	✓✓	✓✓✓	✓✓	✓✓	✓
5.5.4	Continue experimental work on remedial action for nutrient-enriched standing waters and monitor the results of procedures already taken.	✓	✓	✓	✓	✓
5.5.5	Investigate the impact of introduced species on eutrophic standing waters and develop strategies to mitigate their effects.	X	X	X	X	✓
5.5.6	Promote research into the likely effects of climate change and sea level rise on eutrophic standing waters.	X	X	✓	✓	✓
5.5.7	Contribute information to a World Wide Web based catalogue of survey information as a means of improving access to information on eutrophic standing waters.	✓✓	✓	X	X	X
5.6.1	Ensure that information on well-studied eutrophic standing waters is made readily available and publish advice on good management practice, targeting site managers and policy makers.	✓	✓	✓	X	✓
5.6.2	Continue to contribute to symposia on the conservation of fresh waters and to encourage the publication of papers on issues relating to eutrophic standing waters in peer-reviewed scientific literature.	✓	✓	✓	✓	✓

\* Completed

#### Examples of project work

- The UK steering group, convened to jointly address work on the complementary Mesotrophic Lakes and Eutrophic Standing Waters HAPs has now nine eight times since the HAP was published in December 1998. A combined work programme has been drafted and further work will develop priority actions required to promote progress towards the biological targets.

- An England group for the two HAPs was convened by the Agency in 2001 and now meets periodically. A related collaborative initiative with English Nature is also being progressed, aimed at progressing action plans for priority sites, using funding secured by EN from the Government's Capital Modernisation Fund.
- Through collaborative R&D by UK group members, led by the Agency, a GB inventory of standing waters has been produced and consideration is currently being given to its dissemination in a user-friendly format. In addition, the project considered approaches to prioritising standing waters for protective or restorative action and the UK JSG will determine which approach to adopt, taking into account links to UK preparations for the implementation of the Water Framework Directive.
- The Agency, working with English Nature, has been providing advice and data to Defra to support and influence the department's review of Diffuse Water Pollution from Agriculture (DWPA). Improving the framework and mechanisms for controlling diffuse nutrient pollution are an important element of this review and sites of high conservation status are likely to be priorities for action under the initiative.
- Agency members of the UK Lake HAPs groups provided a stand at the England Biodiversity Fair in March 2004, including a demonstration of the new GIS-based lake inventory and information about lake restoration projects.

**Agency contribution in 2003/04 = approx £100,000 but difficult to assess costs solely attributable to the lake HAPs as much work is to meet the needs of various drivers.**

#### **Action planned for 2004/5**

- The GB inventory of standing waters is now almost complete and will be useful for both BAP and Water Framework Directive purposes. The R&D recommendations for prioritising waters under UK BAP will be considered in determining how best to identify priority sites nationally. The UK lake HAP group intends to produce briefing/promotional material on these developments, aimed at LBAPs and other interested parties.
- Further R&D is in hand to develop the range of reference-based biological measures which are required for Water Framework Directive and which will also inform future assessment of the condition of lake HAP sites.
- The UK Lake HAPs group is to consider the potential for a symposium in March 2005, to help promote the HAPs and national progress to LBAP and other local interested parties.
- The England Country Group for the two HAPs, together with the joint EN/EA action plan initiative, will provide a focus for HAP implementation at national level and should help to establish links to LBAP groups.
- Work to influence to Defra DWPA, described above, will continue.



## Mudflats

Category: 1

Lead Agency: Environment Agency

Trend: ?

Agency co-ordinator: Brian Empson

Focus on biodiversity: page 81

UK BAP Number	UK BAP action needing Agency contribution	Agency contribution				
		2003/4	2002	2001	2000	1995-99
5.1.1	Provide a clear national policy by 2000 for SMPs, land use planning and development control policy which ensures that there is no net loss of tidal flats by development, from a 1992 baseline, and that provision is made for the restoration of natural losses over the longer term.	✓✓	✓✓	✓✓	✓	X
5.2.2	Ensure that wherever practicable coastal defence or other construction works avoid disruption of coastal processes that might lead to a loss of, or damage to, mudflats.	✓✓	✓✓	✓✓	✓✓	✓
5.2.3	Maintain and where possible improve estuarine and coastal water quality.	✓	✓	✓	✓✓	✓
5.3.1	Ensure that good-practice guidance is available to shoreline management authorities on how to plan for the maintenance of mudflats in a period of rising sea level by 2000. Particular attention should be given to the use of dredged material and the creation of new mudflats.	✓✓	✓	✓	✓✓	✓
5.5.1	Run field trials to refine and demonstrate techniques for habitat restoration and creation by 2002. Particular attention should be given to the use of dredged materials.	✓✓	✓	✓✓	✓✓	✓
5.5.2	Continue to develop an understanding of the value of mudflats for flood and coastal defence and the holistic management of these habitats in conjunction with flood risk management.	✓✓	✓	✓✓	✓✓	✓
5.5.4	Initiate research into sediment exchange processes between mudflats and other coastal habitats and on the dynamics of cohesive sediments in estuaries.	✓✓	✓	✓✓	✓	X
5.6.1	Educate planning authorities and developers on the important functions of mudflats in estuarine and coastal systems by the preparation and dissemination of a pamphlet by 2001.	✓	✓	✓	✓	X

See coastal saltmarsh for actions

## CHAPTER 4      PROGRESS IN 2003/4 – CATEGORY 3 & 4 SPECIES AND HABITATS

- 4.1      A flavour of work undertaken for category 3 and 4 species and habitats is presented here. It emphasises that Agency action can benefit a whole range of UK BAP habitats and species, although this excerpt is by no means exhaustive.

### **Creeping marshwort - *Apium repens***

- The Water Resources function has continued to fund the ecohydrological monitoring of the population of Creeping Marshwort on Port meadow (Part of Oxford Meadows cSAC). This project involves the Rare Plant Group (who have been monitoring the population for years) and David Gowing (OU) who is a national expert on lowland haymeadow/wetland vegetation communities.

The meadow has been instrumented with several wells and piezometers and the monitoring of this network is matched with annual botanical surveys in fixed quadrats. It's all part of the RoC project investigating the impacts of abstraction licences.

### **Lesser silver water beetle**

- Lots of work done on distribution and ecology funded by EN. Leaflet produced and been sent to North West Region and EA Wales as they have the species.

### **Natterjack toad**

- In 2003 the Herpetological; Conservation Trust submitted a project to improve 2 breeding ponds on Grune Point. This was approved and the management works have been completed.

### ***Dyschirius angustatus* – a ground beetle**

- Discussions held with SNH as to how to promote the species. Promotion will aid beetle identification by field officers and possibly lead to the location of further colonies.
- Plans for this coming year include production of basic literature and identification key for conservation officers (within the Agency and externally) to promote the species.

### **Holly-leaved naiad - *Najas marina***

- The Broads Authority, English Nature, Norfolk Wildlife Trust and the Environment Agency are funding:
  - M.Sc Project to investigate past conditions at Upton Broad (main site for this plant, which is confined to the Broads area) through analysis of sediment macrofossil remains.
  - Wider collation of information on the site to inform management plan and ensure the species is not adversely affected by future management actions.
- EA are continuing long term water quality monitoring programme at a number of Broads sites, supporting interpretation of distribution data.

### **Netted carpet moth - *Eustroma reticulata***

- On-going Ph.D studentship with the University of Reading and Edge Hill College:- The ecology of *Impatiens noli-tangere* in relation to the conservation of the endangered moth *Eustroma reticulata*. (2004 is last year of fieldwork)
- Fieldwork has concentrated on investigating the effect of cattle grazing/poaching and small-scale disturbance on the regeneration, creation and perpetuation of *I. noli-tangere* colonies. Some success. (EA helped with funding 2002)
- Netted Carpet Larval workshop took place in September 2003 at Brantwood, Coniston
  - id of moth larvae and foodplant.
- Results of September 2003 survey:
  - 58 sites examined- plants at 44 sites with larvae at 15 of these.
  - Larvae continue to be absent from Derwent Water sites, but foodplant population continues to recover from the crash of 1998/9 when the larvae were last found there.
  - Some foodplant number increases at Coniston Water, but some decline at Windermere West.
  - Larval numbers were reduced significantly at all sites, in many cases for the second year running, and this must be a cause for concern.



### **Grass-wrack pondweed**

- Agency involved with review and revision of the Species Action Plan. New site for the species discovered by Agency biological survey in the Trent near Nottingham.

### **Floating-leaved water-plantain**

- Agency involved with review and revision of the Species Action Plan.

### **Wet woodland**

- Agency promoting wet woodland through Great Fen Project. Agency on steering group for Aston University's further work on ecology of wet woodlands.
- Objection to clearance of 3ha of alder carr woodland through 'Works in Rivers' consenting process.

### **Cetaceans and turtles**

- DTI (after consultation) have produced a position paper on Mitigation & Management of Oil & Gas Marine Seismic Surveys (September 2003)
- A national procedure is being developed for the removal of animal carcasses and marine mammals from water courses– contact Patricia Wilson (North East Region)
- Strandings information posters for England and Scotland created by the Marine Animal Rescue Coalition (MARC) and produced by the CRRU in collaboration with BDMLR & WDCCS
- The North East Marine team are part of the response service for the rescue of live stranded cetaceans including harbour porpoise. This work helps to increase our understanding of the species involved and adds records to species databases.

### **Great crested newt**

- Consideration has been given to how to avoid impacts on great crested newt populations by EA fish stocking consents.
- Surveys funded in the county formerly known as Avon.
- Creation of a hibernaculum at Gowdall (NE) (Phase 2).



### **Saline lagoons**

- Lagoons training event hosted by Southern Region on the Isle of Wight – local land managers/practitioners attended, a successful day (Tim Sykes)
- Report on water quality in the Fleet Lagoon produced. Levels of nutrients and phytoplankton investigated (02-03 and 96-98) – contact Richard Acornley (South West Region)
- Starlet sea anemone research prior to the launch of the Regional Biodiversity Strategy – contact Julia Stansfield (Anglian Region)
- Investigation being carried out into a surface water drain adjacent to Pagham Harbour Lagoon, which was renewed without permission. The new system has the potential to add to pollution threats, and concerns have been raised due to the presence of the starlet sea anemone in the lagoon – work is ongoing. Contact Jim McGregor (Southern Region)
- We have been involved in the Widewater Lagoon LNR at Shoreham in West Sussex. 2 years ago the Agency undertook a flood defence improvement scheme which involved raising and widening an area of shingle ridge. Concerns were raised regarding the possible impact this would have on a saline lagoon (Widewater) located behind the ridge as the percolation of seawater could have been reduced. As a result, the Agency provided mitigation in the form of a pipe through the shingle ridge to mimic natural inundations and retain the ecological interest of the lagoon. The management of this pipe and the level of water retained within the lagoon is an issue however as local residents want levels kept high for aesthetic and "sweetening" purposes (to reduce the summer smell!) whilst the ornithologists want levels lower to create muddy margins for the birds. The management of the pipe is currently being discussed with all parties and the Agency (Flood Defence).
- The North East Marine team did some scoping for monitoring the new saline lagoon at Greatham Creek, River Tees. The saline lagoons were constructed in 2002/03 using money the Agency contributed in 2001/02. No practical work was undertaken due to changes in temporary staff members

### **Eel grass - *Zostera***

- Dorset Environmental Records Centre and the Devon Biodiversity Records Centre are currently compiling an inventory of *Zostera* species in Devon and Dorset, in partnership with EN and the EA – contacts in EA Mike Williams (Devon Area), Suzy Witt (South Wessex Area)

### **Coastal sand dunes**

- The Agency is a partner in the North Yorkshire & Cleveland Coastal Project which aims to manage conservation and recreation issues along this section of coast. One project undertaken in early 2003 included sand dune restoration at Cattersty beach, Skinningrove, Cleveland. The dune system is the largest of its kind on the North Yorkshire Heritage Coast and is home to many species of dune flora and fauna. Fencing and small scale planting of marram grass was undertaken to trap sand and restore the fore dunes.

### **Lowland hay meadow**

- We continued with the Lower Derwent project, North Yorkshire, in conjunction with English Nature, Yorkshire Water and others. The project aims to determine the sustainable management of water resources of the Lower Derwent Valley. Data gathering work has been ongoing throughout 2003-04 and includes: vegetation

surveys of the Ings and review, vegetation nutrient analysis, Ings birds surveys and review, Ings modelling report from consultants and river water and sediment nutrient analysis. Further modelling tweaks are likely to be needed in 2004-05. The final output of the project is the production of an integrated management plan for the Lower Derwent Valley and Ings by November 2004.

#### **Reedbed**

- Creation of 6.5ha of open reedbed and open water habitat to support bittern, reed bunting and marsh harrier in Broomfleet E Yorkshire.

#### **Blanket bog**

- Support given to Upper Colne Valley Integrated Management Plan.

#### **Grazing marsh**

- The Dearne Valley was visited by Defra and RSPB to promote multifunctional use of floodplain/washlands.
- There has been creation of 15ha of floodplain and grazing marsh through various Flood Defence Schemes, including Wombwell, Arksey Ings and Old Moor River Dearne;

#### **Lowland meadow**

- Creation of 1.3ha of lowland meadow at Sykehouse Barrier Flood Defence Scheme (NE).

#### **Lowland raised bog**

- Habitats Directive review of consents for South Pennine Moors Natura 2000 site completed. Included an air quality model.
- Preliminary scoping report for Thorne & Hatfield Moors to Mire to provide basis for larger external funding bid.

#### **Heathland**

- Contribution to Coalfield heathlands project, aiming to restore 100ha of heathland.

#### **Estuaries**

- Huge 10 year monitoring programme to be set up at Paull Holme Strays in 2004/5 as part of the Humber Estuary Flood Defence Scheme. The programme will include breeding birds, invertebrates, flora, amphibians





## CHAPTER 5 CASE STUDIES

- 5.1 This chapter outlines 8 projects that have benefited biodiversity and are taken from the Conservation, Access and Recreation (CAR) Report for 2003/4 that can be viewed in full on our website.
- 5.2 For further illustrated examples look out for our 2005 biodiversity calendar.

### CHICHESTER COASTAL PLAIN SUSTAINABLE FARMING PARTNERSHIP

<b>Type of activity that the project represents</b>	Habitat restoration & provision, social inclusion & survey work.
<b>Location</b>	Chichester Coastal Plain, Sussex
<b>Agency Area and Region</b>	Sussex Area, Southern Region
<b>Time taken to complete the project</b>	2001 – 2003 (3 years)
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>The project was initiated and designed by Sussex FRB.</li> <li>Key financial and technical support was provided by Sussex FRB, Sussex Wildlife Trust, Hampshire Wildlife Trust and West Sussex County Council.</li> <li>Combined practical expertise and advice from the Sussex Farming and Wildlife Advisory Group (FWAG) underpinned by research and experimental trials undertaken by The Wildlife Conservation Research Unit (WildCRU).</li> <li>Additional support from the Holly Hill Trust, the Rufford Foundation, Chichester Harbour Conservancy, English Nature, People's Trust for Endangered Species and Southern Water.</li> </ul>
<b>Total expenditure</b>	£63,600 over three years
<b>Site Management</b>	Split between private landowners and tenant farmers.
<b>Agency Functional links</b>	Flood Defence, the Emergency Work Force (Direct Works) and Water Resources.
<b>Biodiversity benefits</b>	Water voles, general wetland habitat

#### Key points

- The partnership worked directly with the farming community in the Chichester Coastal Plain.
- The nationally threatened water vole was used as a key biodiversity indicator species to focus a large-scale landscape conservation approach for habitat enhancement and creation on individual farms secured through the use of whole farm conservation plans.
- The whole farm conservation plans provided advice on a range of issues such as livestock and grassland management, arable margins and buffer strip management, ditch management, hedge management and creation, wetland management and creation, farm operation and resource management.
- This whole farm approach successfully built on and utilised the technical expertise of all the partnership individuals involved.
- A best practice demonstration project area of 42 different farm holdings totalling 8,400 hectares was established to illustrate sustainable farming and biodiversity enhancements. The lessons learnt can be applied throughout the country and has directly inspired a new venture addressing landscape restoration within the Upper Thames tributaries' Environmentally Sensitive Area.



#### Summary of achievements to date

- Increased water vole populations in the coastal plain area from 100 individuals in 2000 to 348 in 2003;
- Establishment of 61km of 6 metre grass margins along watercourses;
- 4,556 hectares entered into Countryside Stewardship;
- 7 km of fencing installed to protect watercourses from grazing and poaching by cattle;
- 87 km of riles and ditches sensitively maintained by the Environment Agency.

## EXPOSED RIVERINE SEDIMENT SURVEY WORK

<b>Type of activity that the project represents</b>	Biodiversity and survey work
<b>Location</b>	Rivers throughout the Agency's Cornwall Area
<b>Agency Area and Region</b>	Cornwall Area, South West Region
<b>Time taken to complete the project</b>	May 2001 - November 2003
<b>Partnerships</b>	External consultant Dave Bell
<b>Total expenditure</b>	£15K
<b>Site Management</b>	N/A
<b>Agency Functional links</b>	Ecological Appraisal Team
<b>Biodiversity benefits</b>	Exposed riverine sediment and associated species

### Key Points

- The survey took place to determine the presence and quality of exposed riverine sediments throughout the Agency's Cornwall Area and within the invertebrate population whose habitats the sediments support e.g. river shingle beetles (A Biodiversity Action Plan beetle species).
- The survey was initiated due to a lack of understanding of present habitats and the extent of exposed riverine sediments and Biodiversity Action Plan (BAP) species within Cornwall.
- The survey has resulted in up to date information on the distribution of exposed riverine sediment species and habitat for use in local and national biodiversity planning.
- The survey has provided expert knowledge on the identification of exposed riverine sediment species and methods of surveying.
- As well as surveying the rivers of the Agency's Cornwall Area, a survey was also carried out on Loe Bar, a vegetated coastal shingle area which forms part of Loe Pool SSSI (Site of Special Scientific Interest).
- A detailed habitat assessment of the extent and quality of exposed riverine sediments was also undertaken on the River Camel cSAC (candidate Special Area of Conservation).



## GOWY MEADOWS

<b>Type of activity that the project represents</b>	Water level management, habitat improvement.
<b>Location</b>	Gowy Meadows, Cheshire
<b>Agency Area and Region</b>	South Area, North West Region
<b>Time taken to complete the project</b>	Initial work 6 months but site management and further developments are still ongoing (see below)
<b>Partnerships</b>	Shell UK Cheshire Wildlife Trust
<b>Total expenditure</b>	£1.7 million
<b>Site Management</b>	Cheshire Wildlife Trust
<b>Agency Functional links</b>	Flood Defence
<b>Biodiversity benefits</b>	Lesser silver water beetle, great crested newt, water voles, reed bunting, lapwing, black poplar, dragonflies, waders, wildfowl and rare plants. Lowland grazing meadow

### Key points

- The Gowy meadows provide flood storage for Shell's Stanlow Oil Refinery. As part of a new flood defence scheme we provided sluices to control water levels over the 170Ha site. This allows creation of features such as peat scrapes, which provide valuable habitats for many rare species.
- The site consists of low lying grazing marsh, intersected by drainage ditches and old hawthorn hedges. The Cheshire Wildlife Trust now manages the land as a nature reserve on a 25-year lease from the owners, Shell UK. During the winter months the meadows are flooded to attract birds such as teal and snipe. In the summer, cattle graze the meadows. Buzzards and kestrels are a common sight over the meadows.
- Work started on the site in March 2002 and was substantially completed by 6th September 2002. Works included raising low areas of tidal defences, reprofiling existing flood defences, refurbishment of existing sluice gates and the diversion of Thornton Brook into the River Gowy.
- During the construction phase the contractor exercised great care to protect the existing ecology, as well as to encourage strong recovery and regeneration:
  - under close Agency supervision, existing wrens' nests were carefully monitored to avoid disturbance to eggs.
  - each machine bucket of topsoil was carefully inspected to ensure that it was not home to any newts
  - wherever possible, reeds and other aquatic plants were transferred from local colonies
  - shallow pools were formed within the newly diverted Thornton Brook channel to create suitable areas for wildlife to thrive
  - a large number and variety of plants were planted along the channel
  - all materials that were dug up on site were recycled and used to build the new flood defences. This reduced the need for imported clay and generated less traffic
  - a major new wetland nature reserve has been created which now makes good use of the once potentially harmful floodwaters
- The scheme now incorporates the largest Water Level Management Plan in Cheshire, with carefully positioned sluice gates allowing water levels to be adjusted within the drainage ditches.
- This has enhanced what was already the best lowland wet grassland site in Cheshire and has provided an improved environment for the host of rare and interesting plants, insects and birds which thrive there. These include many species of dragonfly and rare plants, such as the water violet and the carnivorous bladderwort.





## NORTON COURT FARM, COOMBE HILL MEADOWS

<b>Type of activity that the project represents</b>	Wet grassland habitat restoration
<b>Location</b>	Coombe Hill Meadows, near Tewkesbury, Gloucestershire
<b>Agency Area and Region</b>	Lower Severn Area, Midlands Region
<b>Time taken to complete the project</b>	The capital works detailed below took three weeks to complete but are part of a 10-year management agreement that will be supported by the Severn and Avon Vales Wetlands Partnership.
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>• Project led by Severn and Avon Vales Wetlands Partnership.</li> <li>• Work carried out in partnership with the landowner, Defra and a local contractor.</li> </ul>
<b>Total expenditure</b>	£7K
<b>Site Management</b>	The site is managed by the landowner in accordance with the Countryside Stewardship Scheme Agreement (Rural Development Service, Defra).
<b>Agency Functional links</b>	Development Control
<b>Biodiversity benefits</b>	Floodplain grassland, waders, curlews

### Key Points

- The project is part of a 10-year management agreement to restore approximately 58 hectares of floodplain grassland and arable farmland to high quality wet grassland habitat at Coombe Hill Meadows.
- Works included reprofiling derelict drainage ditches, installing water-level control structures and the excavation of a shallow scrape.
- The area is one of Gloucestershire's most important floodplain sites for breeding waders, especially curlew.
- The meadows are adjacent to the Gloucestershire Wildlife Trust's Coombe Hill Meadows Nature Reserve (60 hectares), which includes Long Pool SSSI (Site of Special Scientific Interest).
- Restoration of these meadows extends the area under conservation management at Coombe Hill and enhances the overall control of water resources.
- The meadows are part of the Coombe Hill/River Chelt Basin, adjacent to the River Severn. In conjunction with Countryside Stewardship Schemes involving the Wildlife Trust and another 4 landowners, they form a complex of floodplain habitats covering over 250 hectares.
- The primary beneficiary of the works will be wildlife, however the site is accessible to walkers and forms part of the complex of meadows that the Wildlife Trust is promoting for visitor access.





## POOL FROG CONSERVATION PROJECT

<b>Type of activity that the project represents</b>	Biodiversity and habitat restoration
<b>Location</b>	14 ponds in Hills and Holes Plantation, Thetford Forest, Norfolk
<b>Agency Area and Region</b>	Central Area, Anglian Region
<b>Time taken to complete the project</b>	3 years to date
<b>Partnerships</b>	English Nature, Anglian Water, Herpetofauna Conservation Trust and the Forestry Enterprise.
<b>Total expenditure</b>	£23K
<b>Site Management</b>	The site is managed by Forestry Enterprise
<b>Agency Functional links</b>	None
<b>Biodiversity benefits</b>	Pool frog, ponds

### Key Points

This project took place to restore the habitat and re-introduce pool frog (*Rana lessonae*) to Thetford Forest, currently extinct in Britain.

- 2001: Assessment of suitable reintroduction sites for pool frog.
- 2003/04: Pond clearance. The site is of mixed woodland with many ponds and pingos, mostly shaded by trees and close to an area previously known to be inhabited by pool frog. In addition to dredging, the work will involve the removal of trees which shade the ponds, as basking in the sun is important to the development of the frogs.
- Spring/summer 2004: Planned re-introduction of pool frog.



## RIVER BRENT ENHANCEMENT PROJECT (PHASE ONE)

<b>Type of activity that the project represents</b>	Flood defence, habitat restoration & provision, history & heritage, biodiversity and recreation.
<b>Location</b>	Tokington Park, Wembley, London
<b>Agency Area and Region</b>	North East Area, Thames region
<b>Time taken to complete the project</b>	4 years (1999-2003), including project development
<b>Partnerships</b>	London Development Agency, European Union, London's Waterway Partnership, the Neighbourhood Renewal Fund, London Borough of Brent
<b>Total expenditure</b>	£1.37 million
<b>Site Management</b>	London Borough of Brent.
<b>Agency Functional links</b>	Flood Defence
<b>Biodiversity benefits</b>	Generally improved riverine habitat

### History

- The River Brent has undergone periodic modifications for flood protection, most significantly during the 1930s when major channel straightening was carried out and concrete lining was used to limit erosion from banks. Consequently, much of the ecological value of the river had been lost.
- Simultaneously, there had been a decline in the amenity value of the river and adjoining parks for recreation and a decline in short journeys on foot or bicycle due to poor urban design. This had stemmed from a singular focus on the function of the river channel for dispersing water and a failure to integrate complementary functions of the site as a whole.



### Project Details

Phase 1 has seen several major changes in the park:

- A section of the concrete channel has been filled in and replaced with a meandering river to encourage wildlife and plants and to enable access to the water at certain points for education and recreation.
- Such river meanders existed on the River Brent prior to 1940 and with current knowledge we can maintain this more natural river channel while still controlling flooding.
- The new channel also provides egress points for anyone falling in the water; a great improvement on the 2m high concrete walls.
- A backwater has been incorporated to encourage biodiversity and create a secluded wildlife area.
- A new footbridge has been placed by the pavilion to create an additional crossing point. This will help with journeys to work and school and circular walks/jogs in the park. The bridge is watched by new CCTV cameras and it is hoped that increased usage of the area will help discourage crime and reduce fear of crime.
- As part of the open space improvements a new cycle path now runs along the riverside. It links the residential areas to employment areas in Wembley Industrial Estate and Park Royal.
- Hundreds of plants and trees have been planted and benches and litter bins installed.
- Information panels are being designed to describe the changes in the park and help park users identify wildlife species.

## RIVER HULL HABITAT IMPROVEMENTS

<b>Type of activity that the project represents</b>	Habitat restoration and biodiversity
<b>Location</b>	River Hull Site of Special Scientific Interest (SSSI), East Riding, Yorkshire
<b>Agency Area and Region</b>	Ridings Area, North East Region
<b>Time taken to complete the project</b>	12 months (April 2003 - March 2004)
<b>Partnerships</b>	Yorkshire Wildlife Trust, English Nature, local landowners and local fishing clubs.
<b>Total expenditure</b>	£9K
<b>Site Management</b>	Local landowners
<b>Agency Functional links</b>	None
<b>Biodiversity benefits</b>	General habitat improvement

### Key Points:

- The project involved improving the habitat quality of the river.
- Habitat improvement measures included restoration of physical features such as marginal vegetation, \*faggoting of washouts, gravel cleaning and tree planting.
- The project has delivered improvements in biodiversity for key habitats and species.

\* Faggoting is the use of bundles of sticks (usually hazel or willow) placed lengthways parallel to the water flow along the river bank to keep the channel clear of debris.





## TORFAEN CRAYFISH SURVEY

<b>Type of activity that the project represents</b>	Biodiversity and survey work
<b>Location</b>	Torfaen County Borough, Southeast Wales
<b>Agency Area and Region</b>	South East Area, Environment Agency Wales (EAW)
<b>Time taken to complete the project</b>	2003-2004
<b>Partnerships</b>	Countryside Council for Wales (CCW) and Torfaen County Borough Council.
<b>Total expenditure</b>	£5.5K
<b>Site Management</b>	N/A
<b>Agency Functional links</b>	None
<b>Biodiversity benefits</b>	Crayfish


### Key Points

- The project involved undertaking a crayfish survey in a number of watercourses in Torfaen.
- Native crayfish have suffered a major decline in SE Wales but there were some indications of small numbers in small streams in the urbanised area around Cwmbran.
- The Cwmbran area has considerable development pressure so a systematic survey will enable the planning authority to take the local crayfish population into account in development plans and in dealing with planning applications.
- The same information will be of use to the Agency in dealing with consent applications and flood defence operations.
- The Agency is acting as the contact for crayfish in the UK Biodiversity Action Plan.



## CHAPTER 6 FORWARD LOOK: 2004/5

### Wider context

- 6.1 It will be 10 years since publication of the "Biodiversity: the UK Action Plan" and there will be preparations for the review of BAP targets in 2005. This provides an opportunity not only to revisit some of the original targets, but also to press for the inclusion of declining species such as salmon and eel that missed out the first time round.
- 6.2 The 6<sup>th</sup> June 2004 marks the point in the original Habitats Directive timetable where Member States should have designated all their SACs and implemented measures to protect and restore *Natura 2000* sites. 
- 6.3 The 2004 Spending Review will determine resource allocation for the next three financial years (2005/6 to 2007/8) and we will be making a strong case for a grant-aid boost of £12m over that period to make good the funding shortfall of UK BAP actions since 1996. Nevertheless, we are expecting a tight squeeze on resources and hard choices may have to be made.
- 6.4 Details of the fourth Periodic Review of Water Prices (PR04) will be finalised and this will include the size of the environmental programme during 2005-10. We will be pressing hard, with English Nature and CCW, to maximise improvements needed to remedy problems with public water supply abstraction and sewage discharges damaging *Natura 2000* sites and SSSIs.
- 6.5 The "Modernising Rural Delivery Programme", will be high on the agenda following the Haskins Review. We need to ensure that we use the creation of a new Integrated Agency (comprising English Nature, parts of the Countryside Agency, and regional elements of the Rural Development Service) as an opportunity to promote landscape-scale management.

### Policy and process

- 6.6 We will be ensuring that our profile and reputation continue to grow, internally and externally, particularly involving Board members, partners and stakeholders. The inclusion and tracking of biodiversity measures in the corporate scorecard has helped enormously, providing a powerful driver for Regional and Area level work programmes. We will be extending the scorecard measures to cover BAP habitats beyond solely those for which we have a lead, because we need to reflect the substantial amount of work we do for others such as wet grassland and reedbed.
- 6.7 Improved targets and success measures for biodiversity across all parts of the core business are needed to secure further success, and we will need to demonstrate this to the Agency Board when they discuss our performance in December.
- 6.8 Central to the success of delivery biodiversity is the ability to set out clear objectives, priorities and a costed work programme. Regional biodiversity strategies will underpin this, together with our top priority wetlands restoration project proposals published as part of our overall strategy for gaining substantial Heritage Lottery funding.
- 6.9 Ensuring that Agency policies and procedures comply with conservation legislation and that we operate taking full account of biodiversity continue to dominate our agenda. The very successful Habitats Directive model has already been applied to the Countryside and Rights of Way (CRoW) Act, and will be used for the Environmental Liability Directive Regulations and PSA target for improving the condition of SSSIs.
- 6.10 We will be taking forward our new wetland policy and also tackling a backlog of other issues, such as gravel removal, which currently are in a policy vacuum, creating confusion and inefficiencies.

### Promoting biodiversity

- 6.11 We will be repeating the very successful annual seminar, this time in March 2005 at Warwick University and will be focusing effort on Area Environment Managers. Barbara Young will be able to reflect on progress, so far and the work still to do, particularly in the light of 'Making it Happen 2', the Agency's second corporate strategy which will be in an advanced stage of drafting by then.
- 6.12 Our web-page should continue to improve in leaps and bounds and we hope to produce another calendar illustrating some of the best partnership projects around.

- 6.13 The big publicity event will be the launch of '*The State of England's Chalk Rivers*' on behalf of the Chalk HAP Steering Group partners in late July. We hope that we can build on the expected publicity and establish a good platform for a well-planned communications strategy.
- 6.14 We will continue to sponsor relevant seminars, publications and events that promote the conservation of water and wetland wildlife conservation. This will include the Cornwall Knotweed Forum stand at the Chelsea Flower Show in May and the World Wetlands Day CIWEM conference in February.

#### **Habitats Directive**

- 6.15 The work in 2004/5 will represent the really tough part of the review of consents programme for high priority sites – stage 4 or the determination of environmental licences that are damaging or risking damage to *Natura 2000* sites. All the hard work in Stages 1-3 will come to fruition as the nitty-gritty decisions on what to do begin to bite. It promises to be a very challenging task. An on-line training package will be one of the useful products scheduled for release in the late summer.

#### **Improving the condition of SSSIs**

- 6.16 We intend to confirm a programme of work and start dealing with those parts of SSSIs that are in unfavourable conditions on our land. We will start with the highest priority sites and concentrate on actions that will yield the biggest environmental improvements. It is already clear that we cannot improve the condition of the many tiny parcels of land that we own in SSSIs – that will be the responsibility of others.
- 6.17 We are allocating an assignment post to do the necessary planning work for all those other SSSIs in unfavourable condition where we have a part to play because of the activities we regulate or carry out. We expect to have a costed and priority-based programme ready by June 2005.

#### **Water Framework Directive (WFD)**

- 6.18 River basin characterisation, which means assessing pressures and impacts on all 8000 water bodies in England and Wales to determine the risk of failing good ecological status by 2015, is a monumental task. It needs to be completed in time for external comments on 1 September 2004. The Conservation and Ecology Technical Team will continue to be major players in this process. We will also continue to lead the way on developing the testing monitoring and assessment methods for lakes, including the use of chironomid midge larvae head capsules as a surrogate measure for biological water quality.
- 6.19 Building biodiversity into river basin planning and management at an early stage has always been a concern, so we will be using the River Ribble pilot catchment to test some of the ecological methods and also a 'biodiversity framework' which should help to secure improvements for wildlife as an integral part of the planning process. We will be partners with English Nature for this initiative.
- 6.20 In preparation for determining the likely 'suite' of activities forming the Programme of Measures element of the WFD, we will be leading work on hydromorphological monitoring and assessment. This is an important aspect of work, not least because there is no legal precedent for implementing measures to secure the physical elements required to support good ecological status of water bodies. We will work closely with Flood Risk Management and Water Resources to take this new work forward.
- 6.21 Our River Habitat Survey (RHS) database will help to underpin the physical characterisation of rivers as part of WFD and has also been used to develop non-statutory river habitat objectives. These will be tested in preparation for wider consultation with stakeholders.
- 6.22 Our 10-year resurvey of RHS is planned for 2005/6 to 2007/8, and coincides with the need for surveillance monitoring for WFD. We will be working hard to prepare for this, and ensuring that there are sufficient trained and accredited surveyors to carry out the work.
- 6.23 As part of the WFD requirements, we will be promoting the case for developing a multiple-use database that will incorporate the highly successful *Biology for Windows* (BioSys) freshwater biological database, the associated taxon dictionary, and an improved version of the RHS database. Links will be established to other Agency databases (such as fisheries and marine components) to enable Agency biological data to have a common framework for data storage and retrieval.

#### **Marine**

- 6.24 Workloads are expected to increase during the year in response to further reviews of the marine environment, select committee enquiries and the probable moves towards a marine bill. We will continue to improve our cross-functional links,



building on the quantum leap forward as a result of the raised profile of marine issues.

- 6.25 Our successful biannual Newsletter will explain how the Agency's marine work is helping to shape the future of environmental management in the marine and coastal areas.

#### **Invasive species**

- 6.26 The Government is expected to set up a co-ordinating mechanism to take forward the eight key recommendations from the Review Group Report. We will need to develop Agency policy on priorities and action which reflect both strategic requirements and local needs.

#### **Skills and competencies**

- 6.27 We will be rolling out our competency framework and training programme for ecologists as a first step in securing the necessary skills profile needed as we prepare for the Water Framework Directive in particular. Continuing Professional Development (CPD) is now an industry standard and ensuring that our own CPD is fit for purpose is a high priority.

#### **Science**

- 6.28 We will be taking a full part in the Agency's new science arrangements, continuing with our ongoing R&D programme, but ensuring that we promote and commission work on evidence-based decision support. We are using assignment opportunities to help develop (i) decision support tools for conservation and (ii) a high-level biodiversity data acquisition plan. We need both to help us improve our advice to functional colleagues.

#### **Geomorphology**

- 6.29 Understanding the physical processes in catchments and along the coasts is fundamental to delivering integrated river basin management. We will continue to develop our expertise nationally and promote the use of geomorphological principles within flood risk management as a priority, including on-line training material for users.



#### **Improving communications**

- 6.30 Effective communication, internally and externally, is a major challenge because we know everyone is so busy. Nevertheless, we need to ensure that those who need to know are aware of what we're doing and why. Without understanding and support our efforts will not be recognised or rewarded. Equally, we need to be confident that feedback is honest and is acted upon.
- 6.31 We will be finalising our communications strategy which has internal and external elements that cater for a range of different audiences.

#### **Partnership projects**

- 6.32 Another productive year with partners to deliver improvements on the ground is in prospect and we will be striving to secure longer-term support for both national partnerships and local initiatives for biodiversity.

**Paul Raven**

**Head of Conservation and Ecology**

#### **Acknowledgements**

The contents of this report have been co-ordinated by Kate Warr. Many thanks to all contributors, whose enthusiasm and dedication are reflected in the many success stories that are highlighted.



## APPENDIX 1

## AGENCY CO-ORDINATORS FOR UK BAP SPECIES AND HABITATS

Species/habitat	Category	Agency Co-ordinator	Phone	Email
<b>Mammals</b>				
Water vole	1	Alastair Driver	0118 953 5563	alastair.driver@environment-agency.gov.uk
European otter	1	Graham Scholey	01491 828346	graham.scholey@environment-agency.gov.uk
<b>Birds</b>				
Marsh warbler	1	Jeremy Burgess	01732 223165	jeremy.burgess@environment-agency.gov.uk
<b>Fish</b>				
Vendace	1	Cameron Durie	01768 866666	cameron.durie@environment-agency.gov.uk
<b>Invertebrates</b>				
<i>Agabus brunneus</i> – a diving beetle	1	Martin Rule	01208 78301	martin.rule@environment-agency.gov.uk
<i>Anisodactylus poeciloides</i> – a ground beetle	1	Vacant		
<i>Bidessus unistriatus</i> – a diving beetle	1	Terry Clough	01480 414581	terry.clough@environment-agency.gov.uk
Hairy click beetle	1	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
White-clawed crayfish	1	Julie Bywater	01491 828386	julie.bywater@environment-agency.gov.uk
Southern damselfly	1	Tim Sykes	01962 713267	tim.sykes@environment-agency.gov.uk
<i>Clorisia rustica</i> – a stiletto fly	1	Mike Williams	01392 316033	mike.williams@environment-agency.gov.uk
Little whirlpool ram's-horn snail	1	Juliette Hall	01903 703928	juliette.hall@environment-agency.gov.uk
Glutinous snail	1	Huw Jones	01248 670770	huw.jones@environment-agency.gov.uk
Fine-lined pea mussel	1	John Murray-Bligh	01392 352225	john.murray-bligh@environment-agency.gov.uk
Depressed river mussel	1	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
Shining ram's-horn snail	1	Shelagh Wilson	01732 223285	shelagh.wilson@environment-agency.gov.uk
<i>Lophopus cristallinus</i> – a freshwater bryozoan	1	Daryl Buck	01491 828354	daryl.buck@environment-agency.gov.uk
<b>Plants</b>				
Ribbon-leaved water-plantain	1	Gill Walters	01743 272828	gill.walters@environment-agency.gov.uk
Multi-fruited river moss	1	Jonathon Burgess	01208 265038	jonathon.burgess@environment-agency.gov.uk
Tiny fern moss	1	Edward Bradbrook	01732 223103	edward.bradbrook@environment-agency.gov.uk
Water rock bristle	1	Jim Heslop	0191 203 4068	jim.heslop@environment-agency.gov.uk
Beaked beardless-moss	1	Martin Christmas	0113 213 4872	martin.christmas@environment-agency.gov.uk
Violet crystalwort	1	Debbie Cousins	0118 953 5568	debbie.cousins@environment-agency.gov.uk
Five stoneworts	1	Debbie Cousins	0118 953 5568	debbie.cousins@environment-agency.gov.uk
River jelly lichen	1	Marlynnne Good	02920 770088	marlynnne.good@environment-agency.gov.uk
<b>Habitats</b>				
Aquifer-fed naturally fluctuating water bodies	1H	Pat Sones	01480 483931	pat.sones@environment-agency.gov.uk
Chalk rivers	1H	Lawrence Talks	01962 713267	lawrence.talks@environment-agency.gov.uk
Coastal saltmarsh	1H	Brian Empson	01454 623500	brian.empson@environment-agency.gov.uk
Eutrophic standing waters	1H	Simon Leaf	01491 828545	simon.leaf@environment-agency.gov.uk
Mudflats	1H	Brian Empson	01454 623500	brian.empson@environment-agency.gov.uk
<b>Fish</b>				
Allis & twaite shad	2	Miran Aprahamian	01925 653999	miran.aprahamian@environment-agency.gov.uk
Burbot	2	Keith Easton	0115 945 5722	keith.easton@environment-agency.gov.uk
<b>Invertebrates</b>				
<i>Bidessus minutissimus</i> – a diving beetle	2	Mike Williams	01392 316033	mike.williams@environment-agency.gov.uk
Six river shingle beetles	2	Mike Williams	01392 316033	mike.williams@environment-agency.gov.uk
<i>Spiriverpa iunulata</i> – a stiletto fly	2	Mike Williams	01392 316033	mike.williams@environment-agency.gov.uk
Freshwater pearl mussel	2	Anne Lewis	0191 203 4120	anne.lewis@environment-agency.gov.uk
<b>Plants</b>				
Cut-grass	2	Vacant		
Triangular club-rush	2	Paul Smith	01903 703950	paul.smith@environment-agency.gov.uk
Greater water parsnip	2	Lesley Saint	01480 414581	lesley.saint@environment-agency.gov.uk
<b>Mammals</b>				
Baleen whales	3	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
Barbastelle bat	3	Joe Stevens	01962 713267	joe.stevens@environment-agency.gov.uk
Bechstein's bat	3	Joe Stevens	01962 713267	joe.stevens@environment-agency.gov.uk
Harbour porpoise	3	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
Pipistrelle bat	3	Joe Stevens	01962 713267	joe.stevens@environment-agency.gov.uk
Lesser horseshoe bat	3	Joe Stevens	01962 713267	joe.stevens@environment-agency.gov.uk
Toothed whales (not small Dolphins)	3	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
<b>Birds</b>				
Bittern	3	Judith Bennett	01768 866666	judith.bennett@environment-agency.gov.uk
Reed bunting	3	Judith Bennett	01768 866666	judith.bennett@environment-agency.gov.uk
Common scoter	3	Dermot Smith	01925 653999	dermot.smith@environment-agency.gov.uk
<b>Amphibians and reptiles</b>				
Pool frog	3	Vacant		
Great-crested newt	3	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
Marine turtles	3	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
<b>Fish</b>				
Commercial marine fish	3	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
<b>Invertebrates</b>				
Black bog ant	3	Ben Wilson	01554 757031	ben.wilson@environment-agency.gov.uk
<i>Aphodius niger</i> – a scarab beetle	3	Tim Holzer	01962 713267	tim.holzer@environment-agency.gov.uk
<i>B. argenteolum</i> – a ground beetle	3	Vacant		
Cliff Tiger beetle	3	Vacant		



Species/habitat	Category	Agency Co-ordinator	Phone	Email
<i>C.exiguis</i> – a leaf beetle	3	Vacant		
Mire pill beetle	3	Pete Sibley	0115 945 5722	peter.sibley@environment-agency.gov.uk
<i>Donacia aquatica</i> – a reed beetle	3	Vacant		
<i>Donacia bicolora</i> – a reed beetle	3	Vacant		
Spangled diving beetle	3	Vacant		
<i>Helophorus laticollis</i> – a water beetle	3	Vacant		
Lesser silver water beetle	3	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
<i>Hydroporus rufifrons</i> – a diving beetle	3	Pete Sibley	0115 945 5722	peter.sibley@environment-agency.gov.uk
<i>Laccophilus poecilus</i> – a diving beetle	3	Vacant		
<i>Melanotus punctolineatus</i> – a click beetle	3	Vacant		
<i>O. oculata</i> – a longhorn beetle	3	Martin Slater	01480 483880	martin.slater@environment-agency.gov.uk
<i>Paracymus aeneus</i> – a water beetle	3	Vacant		
<i>Pterostichus aterrimus</i> – a ground beetle	3	Vacant		
<i>P. crux major</i> – a ground beetle	3	Ben Wilson	01554 757031	ben.wilson@environment-agency.gov.uk
<i>Rhynchaneas testaceus</i> – a jumping weevil	3	Vacant		
Mole cricket	3	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
Large marsh grasshopper	3	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
<i>Brachyptera putata</i> – a stonefly	3	Vicky Ellis	02920 770088	vicky.ellis@environment-agency.gov.uk
<i>Eristalis cryptarum</i> – a hoverfly	3	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
<i>Lipsothrix nervosa</i> – a crane fly	3	Cathy Beeching	01684 850951	cathy.beeching@environment-agency.gov.uk
<i>Lipsothrix nigrstigma</i> – a crane fly	3	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
<i>Odontomyia hydroleon</i> – a soldier fly	3	Sue Pacey	01904 822515	sue.pacey@environment-agency.gov.uk
Sandbowl snail	3	Vacant		
Narrow-mouthed whorl snail	3	Daryl Buck	01491 828513	daryl.buck@environment-agency.gov.uk
Geyers whorl snail	3	Daryl Buck	01491 828513	daryl.buck@environment-agency.gov.uk
Round-mouthed whorl snail	3	Daryl Buck	01491 828513	daryl.buck@environment-agency.gov.uk
Desmoulin's whorl snail	3	Daryl Buck	01491 828513	daryl.buck@environment-agency.gov.uk
Netted carpet moth	3	Brian Ingersent	01768 866666	brian.ingersent@environment-agency.gov.uk
Starlet sea anemone	3	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
Rosiers sac spider	3	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
Fen raft spider	3	Alan Hull	01473 727712	alan.hull@environment-agency.gov.uk
Medicinal leech	3	David Thorpe	01286 871982	david.thorpe@environment-agency.gov.uk
<b>Fungi</b>				
<i>Armillaria ectypa</i> – an agaric fungus	3	Vacant		
Royal bolete	3	Fran Bayley	01276 454501	fran.bayley@environment-agency.gov.uk
Date-coloured wax cap	3	Fran Bayley	01276 454501	fran.bayley@environment-agency.gov.uk
Hydnoid fungi	3	Fran Bayley	01276 454501	fran.bayley@environment-agency.gov.uk
<b>Plants</b>				
Creeping marshwort	3	Paul St Pierre	01491 828456	paul.stpierre@environment-agency.gov.uk
True fox sedge	3	Vacant		
Starfruit	3	Chris Catling	01707 632370	N/A
Rock sea lavender	3	Mair Rees	01792 645300	N/A
Floating water-plantain	3	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
Slender naiad	3	Vacant		
Holly-leaved naiad	3	Jo-Anne Pitt	01493 488515	jo-anne.pitt@environment-agency.gov.uk
Pillwort	3	Vacant		
Grass wrack pondweed	3	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
Yellow marsh saxifrage	3	Roger Martin	01904 692296	roger.martin@environment-agency.gov.uk
Dune thread moss	3	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Long leaved thread moss	3	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Sea bryum	3	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Prostrate feather moss	3	Carri Lane	01248 670770	carri.lane@environment-agency.gov.uk
Ballic bog moss	3	Vacant		
Derbyshire feather moss	3	Pete Sibley	0115 945 5722	peter.sibley@environment-agency.gov.uk
Yorkshire feather moss	3	Vacant		
Marsh earwort	3	Trevor Renals	01208 78301	trevor.renals@environment-agency.gov.uk
Atlantic lejeuna	3	Trevor Renals	01208 78301	trevor.renals@environment-agency.gov.uk
Norfolk flapwort	3	Amanda Elliott	01473 706734	N/A
Veilwort	3	Vacant		
Petalwort	3	Bryan Jones	01248 670770	bryan.jones@environment-agency.gov.uk
Lesser bearded stonewort	3	Debbie Cousins	0118 953 5568	debbie.cousins@environment-agency.gov.uk
<b>Habitats</b>				
Blanket bog	3H	Paul Thomas	01772 339882	paul.thomas@environment-agency.gov.uk
Coastal sand dunes	3H	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Coastal vegetated shingle	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Fens	3H	Vacant		
Grazing marsh	3H	Martin Fuller	01904 692296	martin.fuller@environment-agency.gov.uk
Lit & sub lit chalk	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Lowland calcareous grass	3H	Vacant		
Lowland dry acid grass	3H	Vacant		
Lowland hay meadow	3H	Cathy Beeching	01684 850951	cathy.beeching@environment-agency.gov.uk
Lowland raised bog	3H	Mike Harrison	01768 866666	michael.harrison@environment-agency.gov.uk
Maerl beds	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Maritime cliffs & slopes	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk

Species/habitat	Category	Agency Co-ordinator	Phone	Email
Mesotrophic lakes	3H	Simon Leaf	01491 828545	simon.leaf@environment-agency.gov.uk
Modiolus modiolus beds	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Reedbeds	3H	Judith Bennett	01768 866666	judith.bennett@environment-agency.gov.uk
Sabellaria alv reefs	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Saline lagoons	3H	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
Seagrass beds	3H	Nicole Price	01258 483411	nicole.price@environment-agency.gov.uk
Sheltered muddy gravels	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Sublittoral sands & gravels	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Tidal rapids	3H	Sarah Peaty	0191 203 4140	sarah.peaty@environment-agency.gov.uk
Upland hay meadow	3H	Roger Martin	01904 692296	roger.martin@environment-agency.gov.uk
Wet woodland	3H	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
<b>Birds</b>				
Aquatic warbler	4	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
<b>Fish</b>				
Houting	4	Miran Aprahamian	01925 653999	miran.aprahamian@environment-agency.gov.uk
<b>Amphibians and reptiles</b>				
Natterjack toad	4	Steve Garner	01768 866666	steve.gamer@environment-agency.gov.uk
Sand lizard	4	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
<b>Invertebrates</b>				
<i>Armara stenua</i> - a ground beetle	4	Vacant		
<i>Badister collaris</i> - a ground beetle	4	Vacant		
<i>Badister peltatus</i> - a ground beetle	4	Vacant		
<i>Bembidion humerale</i> - a ground beetle	4	Pete Sibley	0115 945 5722	peter.sibley@environment-agency.gov.uk
Dune tiger beetle	4	Vacant		
<i>Dromius sigma</i> - a ground beetle	4	Vacant		
<i>Dyschirius angustatus</i> - a ground beetle	4	Helen Orme	01768 866666	helen.orme@environment-agency.gov.uk
<i>Hydrophorus cantabricus</i> - a diving beetle	4	Vacant		
<i>Octeobius poweri</i> - a beetle	4	Francis Farr Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
Marsh fritillary	4	David Thorpe	01286 871982	david.thorpe@environment-agency.gov.uk
<i>Lipsothrix errans</i> - a crane fly	4	Andrew Heaton	0121 711 5834	andrew.heaton@environment-agency.gov.uk
<i>Rhabdomastix laeta</i> - a crane fly	4	Vacant		
<i>Heptagenia longicauda</i> - a mayfly	4	Vacant		
Native oyster	4	Vacant		
<i>Euophrys browni</i> - a jumping spider	4	Francis Farr-Cox	01278 457333	francis.farr-cox@environment-agency.gov.uk
<i>Aphrodes duffieldi</i> - a leafhopper	4	Vacant		
Lesser water measurer	4	Vacant		
<i>Orthotylus rubidus</i> - a plant bug	4	Vacant		
<i>Prostoma jenningsi</i> - a freshwater nemertean	4	Vacant		
<b>Fungi</b>				
Devil's bolete	4	Vacant		
<b>Plants</b>				
Three lobed crowfoot	4	Mike Williams	01392 444000	mike.williams@environment-agency.gov.uk
Shore dock	4	Martin Rule	01208 78301	
Matted bryum	4	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Pear fruited bryum	4	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Cemous bryum	4	Neil Guthrie	01772 339882	neil.guthrie@environment-agency.gov.uk
Silky swan neck moss	4	Vacant		
Glaucous beard moss	4	Vacant		
Clustered earth moss	4	Vacant		
Millimetre moss	4	Vacant		
Spruce's bristle moss	4	Vacant		
Spreading-leaved beardless moss	4	Vacant		
<i>Anotrichium barbatum</i>	4	Vacant		
Starry Breck-lichen	4	Vacant		
Orange-fruited elm-lichen	4	Vacant		
<i>Pseudocyphellaria norvegica</i> - a lichen	4	Vacant		

## APPENDIX 2

## LIST OF PARTNER ORGANISATIONS 1996-2004

Acorn Trust	British Gas
Action for the River Kennet	British Herpetological Society
ADAS	British Telecom
Albrighton Moat Project	British Trust for Conservation Volunteers
Aln Environmental Management Project	British Trust for Ornithology
Anglian Water	British Waterways
Aqua vitae 21	Broads Authority
Ashford Borough Council	Buckinghamshire County Council
Aston University	Burton Mutual Anglers Association
Association of British Ports	Butterfly Conservation
Auto Turned Products (Northants Ltd)	Camborne School of Mines
Avon Wildlife Trust	Cambridgeshire Biodiversity Steering Committee
Aylesford Newsprint	Cambridgeshire County Council
Bakewell Biodiversity Partnership	Cambridgeshire Wildlife Trust
Bala Anglers	Camel Trail Partnership
Balfour Browne Club	Canterbury City Council
Barford and Burcombe Angling Club	Caradon District Council
Barn Owl Trust	Cardiff City Council
Barnsley Council	Carrick District Council
Barrow County Council	Carstairs Countryside Trust
Basingstoke and Deane Borough Council	Central Rivers Project
Basingstoke Canal Society	Centre for Aquatic Plant Management
Bat Conservation Trust	Ceredigion County Council
Bath and North East Somerset Unitary Authority	Charmouth Interpretation Centre
BBC Wildlife Magazine	Cheltenham Borough Council
Beaulieu Estates	Cherwell District Council
Bedfordshire & River Ivel Internal Drainage Board	Cheshire County Council
Bedfordshire and Luton Wildlife Working group	Cheshire Wildlife Trust
Bedfordshire County Council	Chesil Bank & Fleet Nature Reserve
Bedfordshire Natural History Society	Chichester Harbour Conservancy
Bedfordshire Wildlife Trust	Chilterns Chalk Stream Project
Beechcroft Trust	Chilterns District Council
Bees and Trees	Christchurch Borough Council
Bentley Wood Trust	City of Rochester upon Medway City Council
Berks, Bucks & Oxon Naturalists Trust	City of York Council
Berkshire Nature Conservation Forum	Cleveland Community Forest
Biffa	Cliffe and Cliffe Woods Parish Council
Birmingham Groundwork	Coal Authority
Birmingham/Black Country Wildlife Trust	Colchester Borough Council
Bishops Stortford Town Council	Colchester Natural History Society
Blackburn and Darwin Council	Collier Street Residents Society
Blackburn Groundwork	Colne Countryside Project
Blackpool Zoo	Community Forest
Blackwater Valley Countryside Management Service	Conwy County Borough Council
Blenheim Park Estate	Coquet Environmental Management Project
Blue Circle Industries	Cornwall Bird Watching and Preservation Society
Boston Borough Council	Cornwall College
Bournemouth and West Hampshire Water	Cornwall County Council
Bournemouth University	Cornwall Rural Community Council
Bracknell Herons Angling Club	Cornwall Wildlife Trust
Bracknell Town Council	Corporation of London
Brampton Valley Project	Cotswold Fly Fishers
Breckland District Council	Cotswold Water Park Society
Brecknock Bat Group	Council for the Protection of Rural England
Brecks Countryside Project	Country Landowners Association
Bridgnorth District Council	Countryside Agency
Brighton Sea Life Centre	Countryside Council for Wales
Bristol City Council	Cove Brook Greenway Group
Bristol Water	Coventry City Council
British Butterfly Conservation Society	Crawley Borough Council
British Dragonfly Society	Creekside Ecology Group
	Creekside Education Trust

Crown Estate	Farming & Rural Conservation Agency
Cumbria Biodiversity Partnership	Farming & Wildlife Advisory Group
Cumbria County Council	Fenland District Council
Cumbria Wildlife Trust	Field Studies Council
Dacorum Council	Fish Conservation Centre
Darent River Preservation Society	Flamstead Parish Council
Darlington Borough Council	Fleet Pond Society
Dartford Borough Council	Flintshire County Council
Dartford Rotary Club	Folkstone and Dover Water Services
Dartmoor National Park	Forestry Enterprise
Dee Estuary Conservation Group	Forestry Commission
Defra	Forton Parish Council
Derbyshire County Council	Foster Wheeler
Derbyshire Wildlife Trust	Fowey Harbour Office
Derwent Anglers Association	Framlingham College
Derwent Owners Association	Freshwater Biological Association
Derwentside District Council	Friends of Rawcliffe Meadows
Devon Birdwatching and Preservation Society	Froglife
Devon County Council	Fuji-Hunt
Devon Wildlife Trust	Gaia Trust
Dickens Country Protection Society	Game Conservancy Trust
Dorchester Heritage Committee	Gillingham Action for Nature Group
Dorset County Council	Gillingham Civic Society
Dorset Seasearch	Glamorgan Wildlife Trust
Dorset Wildlife Trust	Glaxo Wellcome
Dover District Council	Glendale Ground Maintenance
Duchy of Cornwall	Gloucester City Council
Dudley Metropolitan Borough Council	Gloucestershire County Council
Durham Biodiversity Partnership	Gloucestershire Wildlife Trust
Durham Wildlife Trust	Godalming Town Council
East Cambridgeshire District Council	Gorhambury Estate
East Devon District Council	Gosport Borough Council
East Dorset District Council	Government Offices
East Hants District Council	Grantham Angling Association
East Herts District Council	Great Aycliffe Town Council
East Malling Parish Council	Greater London Authority
East Sussex County Council	Greenwood Community Forest
East Sussex Fire Brigade	Groundwork Thames Gateway
Eastleigh Borough Council	Groundwork Trust
ECON	Guildford Borough Council
Ecoschools- Tidy Britain Group	Gwent Wildlife Trust
ECUS	Gwynedd Council
Eden Rivers Trust	Hadlow College
Elmbridge Borough Council	Hambleton District Council
Ely Ouse Groundwater Project	Hampshire & Isle of Wight Wildlife Trust
Energis	Hampshire Bat Group
English Heritage	Hampshire Constabulary
English Nature	Hampshire County Council
English Partnerships	Hampshire Gardens Trust
Environmental Trust for Berkshire	Hampshire Ornithological Society
Epping Forest District Council	Hampshire Wildlife Trust
Epsom and Ewell District Council	Harnham Water Meadow Trust
Esk Fisheries Association	Harrogate Borough Council
Esmee Fairbairn Foundation	Hart District Council
Essex and Suffolk Water	Hartfield Parish Council
Essex County Council	Hartlepool Borough Council
Essex Field Club	Havant District Council
Essex Wildlife Trust	Havering Borough Council
European Commission	Hawk and Owl Trust
European Regional Development Fund	Hepworth Minerals and Chemicals
European Union	Herefordshire Amphibians and Reptile Team
Exeter City Council	Herefordshire Nature Trust
Exmoor National Park	Heritage Coast Forum
Fareham Borough Council	Heritage Lottery Fund



Heritage Ponds Project  
 Herpetofauna Conservation Trust  
 Hertfordshire & Middlesex Wildlife Trust  
 Hertfordshire Countryside Management Service  
 Hertfordshire County Council  
 Hertfordshire County Council  
 Highways Agency  
 Holly Hill Trust  
 Horsham District Council  
 HM Prison - Probation Service  
 HM Prison Service  
 Hull Valley Wildlife Group  
 Huntingdonshire District Council  
 Icklesham Parish Council  
 IMYRIS (formerly English China Clays International)  
 Industry Nature Conservation Association, Teeside  
 Institute of Freshwater Ecology  
 Institute of Terrestrial Ecology  
 Ipswich Borough Council  
 Ipswich River Action Group  
 Island 2000 Trust  
 Isle of Wight County Council  
 Itchen Valley Country Park  
 Ivel Valley Countryside Project  
 J. T. Baylis & Co  
 John Simonds Trust  
 Joint Nature Conservation Committee  
 Kemmerton Estate, Gloucestershire  
 Kennet Valley Countryside Project  
 Kent County Council  
 Kent District Council  
 Kent High Weald Project  
 Kent Wildlife Trust  
 Kentish Stour Countryside Project  
 Kerrier District Council  
 Keymer Parish Council  
 Kimberley Clark  
 King's College, London  
 Knowsley Borough Council  
 Knowsley Metropolitan Borough Council  
 Lake District National Park  
 Lake District Still Waters Partnership  
 Lancashire County Council  
 Lancashire Wildlife Trust  
 Lancaster City Council  
 Landowners (several hundred)  
 LEADER +  
 Leatherhead Society  
 Lee Valley Angling Consultative Association  
 Lee Valley Regional Park Authority  
 Leeds City Council  
 Leicestershire and Rutland Wildlife Trust  
 Leicestershire County Council  
 Leicestershire Wildfowling Association  
 Lewes District Council  
 Lichfield District Council  
 Lincolnshire County Council  
 Lincolnshire Wildlife Trust  
 Liverpool City Council  
 Liverpool County Council  
 Liverpool John Moores University  
 Llanidloes Town Council  
 Llanover and Coldbrook Estates  
 Local biological records centres

London Borough of Barking and Dagenham  
 London Borough of Barnet  
 London Borough of Bexley  
 London Borough of Brent  
 London Borough of Bromley  
 London Borough of Ealing  
 London Borough of Greenwich  
 London Borough of Hammersmith and Fulham  
 London Borough of Havering  
 London Borough of Hillingdon  
 London Borough of Hounslow  
 London Borough of Lambeth  
 London Borough of Lewisham  
 London Borough of Merton  
 London Borough of Redbridge  
 London Borough of Richmond  
 London Borough of Sutton  
 London Borough of Wandsworth  
 London Development Agency  
 London Ecology Unit  
 London Waterways Project  
 London Wildlife Trust  
 London's Waterway Partnership  
 Loughborough Naturalists' Club  
 Lower Medway Internal Drainage Board  
 Lower Mole Project  
 Lower Ure Conservation Trust  
 Ludlow Millennium Green Project  
 Lune Habitat Group  
 Lymington and Pennington Town Council  
 Macdonalds  
 Maidenhead Greenway Group  
 Maidstone Canoe Group  
 Maidstone Chamber of Commerce  
 Mammal Society  
 Marine Forum for Environmental Issues  
 Marks and Spencer Ltd  
 Medlock / Tame River Valley Initiative  
 Medway City Council  
 Medway River Project  
 Mendip District Council  
 Mersey Basin Campaign  
 Mersey Valley Countryside Warden Service  
 Middlesborough Borough Council  
 Midlands Environmental Business Club  
 Mid-Suffolk District Council  
 Milldown Middle School  
 Millennium Commission  
 Milton Keynes Parks Trust  
 Ministry of Defence  
 Mole Valley District Council  
 Monmouthshire County Council  
 Montgomeryshire Barn Owl Group  
 Montgomeryshire Bird Group  
 Montgomeryshire Wildlife Trust  
 Morecambe Bay Partnership  
 Morley Research Centre  
 Morpeth Town Council  
 Moss Valley Wildlife Group  
 Museum of London  
 Nadder Meadow Conservation Group  
 National Dragonfly Museum  
 National Farmers Union  
 National Forest Company

National Marine Aquarium, Plymouth	Pentex Oil and Gas
National Museum and Galleries of Wales	Penwith District Council
National Pond Life Centre	People, Landscape and Cultural Environment.
National Trust	People's Trust for Endangered Species
Natural History Museum	Peterborough City Council
Nature Conservation Bureau	Pfizer
Nene Valley Project	Pike Anglers Club
Neighbourhood Renewal Fund	Phillimore Farms
New Forest District Council	Piscatorial Society
Newbury District Council	Plantlife
Newcastle City Council	Plymouth County Council
Newcastle-under-Lyne Countryside Project	Plymouth Marine Aquarium
Newent Town Council	Police
Nidderdale Angling Club	Pond Action
Nidderdale Parish Councils	Pond Life
Norfolk Arable Land Management Initiative	Ponds Conservation Trust
Norfolk Coast Project	Poole Agenda 21
Norfolk County Council	Poole Borough Council
Norfolk Ornithologist's Association	Port of Heysham
Norfolk Wildlife Trust	Port of London Authority
North Cornwall District Council	Portsmouth City Council
North Devon District Council	Powys County Council
North Dorset District Council	Priestlands School
North Kent Marshes Initiative	Purbeck District Council
North Lincolnshire Council	Quaggy Waterways action Group
North Shropshire District Council	Rail-link Engineering
North Somerset Council	Railtrack
North Tyneside MBC	Ramblers' Association
North Wales Wildlife Trust	Reading Borough Council
North Warwickshire District Council	Redcard & Cleveland Borough Council
North West and North Wales Sea Fisheries Committees	Redditch Borough Council
North West Kent Countryside Project	Red River Working Group
North West Water	Restormel Borough Council
North York Moors National Park	Rexam UK
North Yorkshire County Council	Rhondda Cynon Taff Countryside Department
Northern Rivers Group	Ribble Catchment Conservation Trust
Northmoor Trust	Richmondshire District Council
Northumberland National Park	RIVA 2000 (Wirral RVI)
Northumberland Wildlife Trust	River Restoration Centre
Northumbria Tourist Board	River Restoration Project
Northumbrian Water	River Severn Otter Project
Norwich Fringe Project	River Stour Trust
Nottingham City Council	River Tarrant Protection Society
Nottinghamshire County Council	River Tyne Riparian Owners and Occupiers Association
Nottinghamshire Wildlife Trust	Rivers Agency (Northern Ireland)
Nuneaton and Bedworth District Council	Robert Stebbings Consultancy
Onyx Environmental Trust	Rochester Upon Medway City Council
Ordnance Survey	Romney Marsh Countryside Project
Otters in Wales	Rother District Council
Oundle Town Council	Rother Environmental Group
Ouse Valley Link Project	Rother Millennium Green Trust
Oxford City Council	Rother Parish Council
Oxford Local Agenda 21 Group	Royal and Ancient Golf Club of St Andrews
Oxford University	Royal Birkdale Golf Club
Oxfordshire County Council	Royal Borough of Windsor and Maidenhead
Oxfordshire Nature Conservation Forum	Royal Borough of Kingston-upon-Thames
Oxfordshire Woodland Project	Royal Botanical Gardens, Kew
Oxon Bat Group	Royal Holloway University of London
Pang Valley Countryside Project	Royal Horticultural Society
Peak District National Park	Royal Parks Agency
Pennon Group (formerly South West Water)	Royal Society for the Prevention of Cruelty to Animals
Penrhyn Angling Club	Royal Society for the Protection of Birds
Penrhyn Estate	

Rufford Foundation  
 Rugby Borough Council  
 Runnymede Borough Council  
 Rural Development Commission  
 Rushmoor Borough Council  
 Rye Bay Countryside Project  
 Rye Conservation Society  
 Rye Harbour Nature Reserve  
 Rye Town Council  
 Ryedale District Council  
 Salisbury & District Soroptomists International  
 Salisbury and District Angling Club  
 Salisbury District Council  
 Salmon and Trout Association  
 Sandwell Metropolitan Borough Council  
 Scarborough Borough Council  
 Scottish Environmental Protection Agency  
 Scottish Natural Heritage  
 Sedgemoor District Council  
 Sefton Coastal Life Project  
 Severn and Avon Vales Wetlands Partnership  
 Severn Otter Project  
 Severn-Trent Water  
 Shared Earth Trust  
 Sheep Dippers Association  
 Sheffield Borough Council  
 Sheffield Wildlife Action Partnership  
 Sheffield Wildlife Trust  
 Shell UK  
 Shepway District Council  
 Shere Parish Council  
 Sherwood Forest Trust  
 Shrewsbury and Atcham District Council  
 Shropshire Amphibian Group  
 Shropshire County Council  
 Shropshire Ornithological Society  
 Shropshire Wildlife Trust  
 Silsoe College  
 Slade Green Community Forum  
 Smith's Aggregates  
 Snowdonia National Park  
 Soap and Detergent Industry Association's  
 Environmental Trust  
 Solihull Borough Council  
 Somerset County Council  
 Somerset Levels and Moors Partnership  
 Somerset Otter Group  
 Somerset Wildlife Trust  
 South Cambridgeshire District Council  
 South Devon Seabird Trust  
 South Downs Conservation Board  
 South East Water  
 South Gloucestershire Council  
 South Gloucestershire District Council  
 South Hams Environment Service  
 South Holderness Countryside Society  
 South Lakeland District Council  
 South Lakes District Council  
 South Somerset District Council  
 South Staffordshire Water  
 South Tyneside Metropolitan Borough Council  
 South West Electricity Board  
 South West Investment Group  
 South West Regional Biodiversity Partnership  
 South Wiltshire Agenda 21  
 Southampton City Council  
 Southern Sea Fisheries Committee  
 Southern Water  
 Sowley Estates  
 Sparsholt College (Winchester)  
 Specialist Anglers' Conservation Group  
 Spelthorne Borough Council  
 Sports Council for England  
 Sports Council for Wales  
 St Albans Sand and Gravel  
 St Margaret's Parish Council  
 Staffordshire County Council  
 Staffordshire Wildlife Trust  
 Stockport Metropolitan Borough Council  
 Stoke-on-Trent City Council  
 Stour Valley Canoe Club  
 Stratford on Avon District Council  
 Suffolk Coastal District Council  
 Suffolk Coasts and Heaths Partnership  
 Suffolk County Council  
 Suffolk Wildlife Trust  
 Surrey Amphibian and Reptile Group  
 Surrey Biodiversity Partnership  
 Surrey County Council  
 Surrey Mammal Project  
 Surrey Otter Project  
 Surrey Water Vole Project  
 Surrey Wildlife Trust  
 Sussex Botanical Recording Society  
 Sussex Downs Conservation Board  
 Sussex Ornithological Society  
 Sussex Rural Committees Council  
 Sussex Wildlife Trust  
 Swale Borough Council  
 Swan Reserve  
 Swansea Council  
 Tamar Estuary Consultative Forum  
 Tames Chase  
 Tarka Project  
 Tarmac Ltd  
 Taunton Deane Borough Council  
 Tees Valley Wildlife Trust  
 Teesdale Wildlife Trust  
 Teignbridge District Council  
 Telford and Wrekin Council  
 TEN Project  
 Test & Itchen Association  
 Test Valley Borough Council  
 Thames 21  
 Thames Landscape Strategy  
 Thames Water Utilities  
 Thamesclean  
 Thamesmead Town Council  
 Thanet District Council  
 The Otter Trust  
 The Silvanus Trust  
 Three Valleys Water  
 Thurrock Unitary Authority  
 Tilhill Economic Forestry  
 Tonbridge & Malling Borough Council  
 Torfaen County Borough  
 Torridge District Council  
 Tower of London

Trafford Metropolitan Borough Council	Welsh Canoe Association
Transco Ltd	Welsh Development Agency
Trent Otter Project	Welsh Water
Trewithen Estates	Wensum Valley project
Trgothnan estate	Wessex Water
Tring Angling Club	West Berkshire Council
Tunbridge Wells Common Conservators	West Cornwall Leader Project
Tusk Force	West Country Rivers Trust
Tweed Forum	West London Rivers Group
Twyford Parish Council	West Midland Bird Club
Tyne Riparian Owners and Occupiers Association	West Sussex County Council
UK Atomic Energy Authority	Western Riverside Environment Trust
University College London	Wey Valley Project
University of Aberdeen	Whale and Dolphin Conservation Society
University of Birmingham	White Cliffs Countryside Project
University of Bristol	White Peak Crayfish Action Group
University of Cambridge	Wigan Metropolitan Borough Council
University of Cardiff	WildCRU
University of Durham	Wild Trout Trust
University of East Anglia	Wildfowl and Wetlands Trust
University of East London	Wildlife Conservation Research Unit
University of Essex	Wildlife Trust West Wales
University of Exeter	Wildwood
University of Greenwich	Wilton Estate
University of Kent	Wilton Fishing Club
University of Leeds	Wiltshire Fishery Association
University of Leicester	Wiltshire Wildlife Trust
University of Liverpool	Wimborne Town Council
University of Loughborough	Winchester Angling Club
University of Newcastle	Winchester City Council
University of Northumbria	Windrush Aquatic Environmental Consultancy
University of Nottingham	Woking Borough Council
University of Oxford	Wokingham District Council
University of Plymouth	Wolverhampton Metropolitan Borough Council
University of Reading	Woodford Conservation Group
University of Sheffield	Woodland Trust
University of Southampton	Woodstock Town Council
University of Swansea	Worcester City Council
University of Wales	Worcestershire County Council
University of York	Worcestershire Wildlife Trust
Upper Waveney Countryside Project	Worldwide Fund for Nature
Urban Wildlife Group	Worthing Borough Council
Vale of White Horse District Council	Writtle College
Wansbeck Environmental Management Project	Wycombe District Council
Warrington Borough Council	Wyre Borough Council
Warwick District Council	Wyre Forest District Council
Warwickshire County Council	Yamanouchi Ltd
Warwickshire Wildlife Trust	YMCA
Waste Recycling Environment Group	Yorkshire Dales Millennium Trust
Water Research Centre	Yorkshire Dales National Park Authority
Water UK	Yorkshire Forward
Watford Borough Council	Yorkshire Otters and Rivers Project
Waveney Valley Project	Yorkshire Rural Community Council
Waverley Borough Council	Yorkshire Water
Wealdon District Council	Yorkshire Wildlife Trust
Weaver River Valley Initiative	Zeneca Chemicals
Welsh Assembly Government	



## APPENDIX 3      ABBREVIATIONS AND ACRONYMS USED IN THE TEXT

AMP	-	Asset Management Plan, Periodic Review of Water Company Prices
ASSI	-	Area of Special Scientific Interest
BAP	-	Biodiversity Action Plan
BARS	-	Biodiversity Action Plan Reporting System
BDMLR	-	British Divers Marine Life Rescue
BRC	-	Biological Records Centre
CAMS	-	Catchment Abstraction Management Strategy
CAR	-	Conservation, Access and Recreation
CCTV	-	Close Circuit Television
CCW	-	Countryside Council for Wales
CiB	-	Communication in Business
CIRIA	-	Construction Industry Research and Information Association
CIWEM	-	Chartered Institution of Water and Environmental Management
CPD	-	Continuing Professional Development
CRoW	-	Countryside and Rights of Way
CRRU	-	Cetacean Research (& Rescue) Unit
DNA	-	Deoxy-ribose Nucleic Acid
DTI	-	Department of Trade and Industry
DWPA	-	Diffuse Water Pollution from Agriculture
EA	-	Environment Agency
EAW	-	Environment Agency Wales
EC	-	European Commission
EN	-	English Nature
ERS	-	Exposed Riverine Sediments
FRB	-	Fisheries, Recreation and Biodiversity
FWAG	-	Farming and Wildlife Advisory Group
GB	-	Great Britain
GIS	-	Geographical Information System
HAP	-	Habitat Action Plan
JNCC	-	Joint Nature Conservation Committee
JSG	-	Joint Steering Group
LBAP	-	Local Biodiversity Action Plan
LEAP	-	Local Environment Agency Plan
LIFE	-	Financial Instrument for the Environment
LNR	-	Local Nature Reserve
LOCAR	-	Lowland Catchment Research
LRC	-	Local Records Centre
MARC	-	Marine Animal Rescue Coalition
M.Sc	-	Master of Science
NGO	-	Non-Governmental Organisation
OU	-	Open University
Ph.D	-	Doctor of Philosophy
PR	-	Price Review
PSA	-	Public Service Agreement
R&D	-	Research & Development
RHO	-	River Habitat Objective
RHS	-	River Habitat Survey
RMNC	-	Review of Marine Nature Conservation
RoC	-	Review of Consents
RSPB	-	Royal Society for the Protection of Birds
SAC	-	Special Area of Conservation
SAP	-	Species Action Plan
SMP	-	Site Management Plan
SNH	-	Scottish Natural Heritage
SSSI	-	Site of Special Scientific Interest
UK	-	United Kingdom
WCA	-	Wildlife and Countryside Act
WDCS	-	Whale and Dolphin Conservation Society
WFD	-	Water Framework Directive
WLMP	-	Water Level Management Plan
WRM	-	Wildlife, Recreation and Marine
WT	-	Wildlife Trusts

## APPENDIX 4

## A LIST OF SPECIES MENTIONED IN THE TEXT

<i>Agabus brunneus</i>	A diving beetle	Little whirlpool ram's horn snail
Allis shad		<i>Lophopus crystallinus</i> A freshwater bryozoan
<i>Anisodactylus poeciloides</i>	A ground beetle	Marsh warbler
Barn owl		<i>Meotica anglica</i> A river shingle beetle
Beaked beardless moss		Mink
<i>Bembidion testaceum</i>	A river shingle beetle	Multi-fruited river moss
<i>Bidessus minutissimus</i>	A diving beetle	Natterjack toad
<i>Bidessus unistratus</i>	A diving beetle	Netted carpet moth
Black poplar		<i>Perileptus areolatus</i> A river shingle beetle
Bladderwort		Pool frog
Burbot		Red swamp crayfish
Buzzard		Reed bunting
Carp		Ribbon-leaved water plantain
<i>Clorismia rustica</i>	A stiletto fly	River jelly lichen
Convergent stonewort		Rossers sac spider
Creeping marshwort		Salmon
Curlew		Shining ram's horn snail
Cut grass		Signal crayfish
Depressed river mussel		Slender stonewort
<i>Dyschirius angustatus</i>	A ground beetle	Snipe
Eel grass		Southern damselfly
European otter		Spiny cheek crayfish
Fine-lined pea mussel		<i>Spiriverpa lunulata</i> A stiletto fly
<i>Fissidens pusillus</i>	A fern moss	Starlet sea anemone
Floating-leaved water plantain		Starry stonewort
Freshwater pearl mussel		Tassel stonewort
Glutinous snail		Teal
Grass wrack pondweed		<i>Thinobius newberyi</i> A river shingle beetle
Great crested newt		Tiny fern moss
Great tassel stonewort		Triangular club rush
Greater water-parsnip		Twaite shad
Hairy click beetle		Vendace
Holly-leaved naiad		Violet crystalwort
<i>Hydrochus nitidicollis</i>	A river shingle beetle	Water rock bristle
Kestrel		Water violet
Lapwing		Water vole
Lesser silver water beetle		White-clawed crayfish
<i>Lionychus quadrillum</i>	A river shingle beetle	

# APPENDIX 5

# R&D OUTPUTS IN 2003/4

Proj. no.	Output Ref. No.	Title of R&D Output	Agency Project Manager
W1-014	W1-014/TR	<i>Alosa alosa</i> and <i>Alosa fallax</i> spp. literature review and bibliography	Andrew Heaton
W1-025	W1-025/TS	DNA extraction from otter spraint and tissue samples	Tim Sykes
W1-034	W1-034/TR	Invertebrates of exposed riverine sediments: phase 3	Viki Hurst
W1-038	W1-038/PR	The ecology of four scarce wetland molluscs	Jason Lavender
W1-042	W1-042/TR	<i>Ranunculus</i> in chalk rivers: phase 2	Allan Frake
	W1-042/CD	<i>Ranunculus</i> database	
W1-047	W1-047/TR	The distribution biology and ecology of shad in south west England	Paul Smith
W1-053	Field Studies Council Occasional Publication 82	Freshwater bivalves of Britain and Ireland	John Murray-Bligh
W1-057	W1-057/TS	Environmental impacts and sustainability of mussel cultivation	Robert Willows
W1-061	EA Publication	Fourth otter survey of England 2000-2002	Andy Crawford
W1-064/2	EA Publication	Focus on biodiversity update 2002	Kate Warr
W1-067	W1-067/TR	Guidance on habitat for white-clawed crayfish	Julie Bywater
W1-068/1	W1-068/1/TR	Great crested newt pilot monitoring project, Glamorgan, Hampshire, Kent and Sussex	Mark Elliott
W1-070	W1-070/TR	Management and conservation of crayfish: proceedings of a conference held on 7/11/02	Peter Sibley
	English Nature Report no. 578	Evaluation of the capacity of pheromones for the control of invasive non-native crayfish	
W1-077	Poster	Barn owl monitoring	Kate Warr