

and by publicity leaflets. (ACTION: EHS,
EN, SNH)

- 5.7 Links with other action plans
- 5.7.1 Implementation of this action plan could benefit other species of the habitat, including the bumblebee *Bombus distinguendus* and the corncrake *Crex crex*.
- 5.7.2 This plan should be considered in conjunction with that for machair.

Scottish wood ant (*Formica aquilonia*) Action Plan

1.	Current status	autecological research in order to develop management advice. Studies of the response of this species to the regeneration of Caledonian pine forest and birch woodlands will also need to be continued.
1.1	The Scottish wood ant can be locally common in undisturbed woodland, including native pine woodland and old birch woodland. It also occurs on the borders and in clearings of forestry plantations. Nests are usually built on well-drained slopes or small ridges. Studies in Finland indicate that the main factors in determining distribution are the availability of suitable nest sites, a favourable microclimate, and a good food supply. Sap-feeding bugs are especially important, both as prey and for the honey-dew that they produce. It has been estimated that 90% of foraging activity by the ants is in the canopy of trees near the nest.	5.1 Policy and legislation
		5.1.1 Include specific targets and management for the Scottish wood ant in Forest Design Plans across the species' current and former range. (ACTION: FE)
		5.1.2 Take account of the requirements of this ant when considering woodland grant scheme applications. (ACTION: DANI, EHS, FC, SNH)
1.2	In Europe this ant is found from the Alps to Siberia and from northern Italy to Arctic Norway. Within the UK it has been recorded as far north as Ross and Sutherland. Its distribution extends west and south of this into the west Highlands and Argyll. Skye and Arran are the only Scottish islands with records. This species is probably under-recorded in the more remote parts of Scotland. A strong population is present at the sole Irish locality for the species in Armagh, Northern Ireland.	5.2 Site safeguard and management
		5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through site management agreements. (ACTION: EHS, FC, SNH)
		5.2.2 Where possible, increase the available habitat at known sites and adjacent areas, and attempt to link up existing fragments of habitat, through native pinewood expansion policies in Indicative Forestry Strategies. (ACTION: FC, SNH)
1.3	In Great Britain this species is classified as Nationally Scarce. It is classified by the IUCN (1996) as globally Near Threatened.	5.2.3 Incorporate the requirements of this species in relevant development policies, plans and proposals. (ACTION: EHS, LAs, SNH)
2.	Current factors causing loss or decline	5.2.4 Ensure that this ant is included in all site management documents for relevant SSSIs/ ASSIs, and management plans for RSPB and FC reserves. (ACTION: EHS, FC, SNH)
2.1	Loss of suitable native pine woodland.	
2.2	Inappropriate woodland management.	
3.	Current action	5.3 Species management and protection
3.1	The Scottish wood ant is included in the SNH Species Action Programme.	5.3.1 None proposed.
3.2	The response of populations of the Scottish wood ant to the regeneration of Caledonian pine forest is being monitored by SNH as a part of the Cairngorms Project.	5.4 Advisory
3.3	Many of the sites where it occurs are SSSIs or NNRs and some are RSPB or FC reserves.	5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: EHS, FC, SNH)
4.	Action plan, objectives and targets	5.5 Future research and monitoring
4.1	Maintain the natural range of this ant in the UK.	5.5.1 Undertake surveys to determine the range and status of this ant in the UK. (ACTION: EHS, FC, SNH)
4.2	Maintain populations at all known sites.	5.5.2 Undertake ecological research to establish the habitat requirements of this species. (ACTION: EHS, FC, SNH)
5.	Proposed action with lead agencies	5.5.3 Monitor the response of the Scottish wood ant to the regeneration of Caledonian pine forest and birch woodland. (ACTION: SNH)
	The prime actions for the Scottish wood ant are to determine its status in the UK, and to instigate sympathetic woodland management to maintain and enhance populations. It will be necessary to undertake	

- 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EHS, SNH)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the Scottish wood ant and the conservation issues associated with its habitats. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: EHS, FC, SNH)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of the habitat, including the spider *Clubiona subsultans* and twinflower *Linnaea borealis*.
 - 5.7.2 This plan should be considered in conjunction with that for native pine woodland.

Red barbed ant (*Formica rufibarbis*)

Action Plan

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| 1. | Current status | 3.3 | The red barbed ant is the subject of an EN Species Recovery Programme, for which an action plan was prepared in 1996. |
| 1.1 | The red barbed ant is one of the most thermophilous species of the <i>Formica</i> genus; it requires an open habitat in order to obtain sufficient warmth through insolation. In Britain, the species nests in short, lowland grass and heather or maritime heath overlying loose or sandy soils. Nests are excavated in the ground or under stones; a small solarium of soil and vegetation fragments may be raised around a supporting grass tussock. Each nest may contain a colony of a few thousand workers along with one or more queens plus brood. In mature and healthy colonies a new sexual generation containing gynes and/or males is usually produced each year, with mating flights most commonly occurring in July. The workers usually forage singly for invertebrate prey or carrion; they will also take nectar and aphid honey-dew. | 4. | Action plan objectives and targets |
| 1.2 | The red barbed ant has been considered a rare species since it was first found in Britain in 1896. It was previously recorded from six mainland British sites and one in the Scilly Isles on Chapel Down, St Martins. All of the mainland sites are (or were formerly) Surrey heathlands. The known distribution of the species is now restricted to two sites in Surrey, Chobham Common and the Bisley ranges, supporting as few as seven and two colonies respectively. The species was still present on St Martins in 1997. The red barbed ant ranges across the Palearctic and is present in southern and central Europe as far north as 62° latitude. | 4.1 | Maintain populations at all known sites. |
| 1.3 | In Great Britain this species is classified as Endangered. | 4.2 | Enhance the population size at all known sites by 2005. |
| 2 | Current factors causing loss or decline | 4.3 | Restore populations to suitable sites in order to maintain five viable populations within the historic range by 2010. |
| 2.1 | Loss of suitable heathland habitat through urban or industrial development, agricultural improvement and afforestation. | 5. | Proposed action with lead agencies |
| 2.2 | Inappropriate heathland management. | | The conservation of the red barbed ant in the UK is dependent initially on the sympathetic management of the few surviving colonies. Ecological research will be necessary in order to refine management advice. Captive breeding techniques will need to be developed, followed by a programme of (re)introduction to ensure that five viable populations are established. |
| 2.3 | Excessive or untimely disturbance of nests through, for example, trampling, off-road vehicles, digging, and inappropriate mechanised scrub or heather clearance. | 5.1 | Policy and legislation |
| 2.4 | Frequent, untimely or intensive heathland fires (although appropriate light burning may be beneficial). | 5.1.1 | Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF) |
| 3. | Current action | 5.2 | Site safeguard and management |
| 3.1 | Both Chobham Common and Bisley ranges are SSSIs; Chobham Common is an NNR. | 5.2.1 | Where possible, ensure that all occupied and nearby potential habitat is appropriately managed, in particular that nests are not shaded by over-hanging vegetation or subjected to excessive disturbance. (ACTION: EN, MAFF) |
| 3.2 | Management action at Chobham Common rests with EN, the Surrey Wildlife Trust, and Surrey County Council. Some management of vegetation immediately around nests, and positioning of roofing tiles to encourage nest building, has occurred. | 5.2.2 | Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN) |
| | | 5.3 | Species management and protection |
| | | 5.3.1 | Reintroduce the red barbed ant to a series of sites within the former range in order to ensure that there is a total of five viable populations by 2010. (ACTION: EN) |
| | | 5.4 | Advisory |
| | | 5.4.1 | Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN) |
| | | 5.5 | Future research and monitoring |
| | | 5.5.1 | Conduct targeted autecological research to inform habitat management. (ACTION: EN) |
| | | 5.5.2 | Develop a methodology for captive rearing. (ACTION: EN) |

- 5.5.3 Establish a regular monitoring programme for this species. (ACTION: EN)
- 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.5.5 Encourage research into the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
- 5.6 Communication and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland heaths, including *Bombylius minor* and *Cicindela sylvatica*.
 - 5.7.2 This plan should be considered in conjunction with that for lowland heathland.

Homonotus sanguinolentus (a spider-hunting wasp) Action Plan

1.	Current status		its dispersal ability. This will need to be followed by a programme of informed habitat management.
1.1	Homonotus sanguinolentus is a predator of spiders of the clubionid genus Cheiracanthium. These spiders construct conspicuous retreats in a number of aerial locations, including grass flower heads and heather inflorescences. The wasp enters the egg-laying retreat of gravid female spiders and lays an egg on the front of the spider's abdomen. The spider remains alive in the retreat whilst the wasp larva feeds on its body fluids. After about 10 days the wasp larva kills the spider and consumes the remains. A greyish cocoon is spun up inside the retreat and the prepupa overwinters inside this.	5.1	Policy and legislation
		5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
		5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2008, for example through agri-environment scheme management agreements. (ACTION: EN, MAFF)
1.2	This spider-hunting wasp has always been erratically and rarely found. There are eight records from lowland heathland in Dorset, Hampshire and Surrey, spanning the years 1900 to 1962. Since then the only record is of a single male taken on Cranes Moor in the New Forest in 1990. It is widespread, but rarely found, throughout southern and central Europe, but is highly thermophilous in the northern part of its range.	5.2.2	Ensure that the habitat requirements of Homonotus sanguinolentus are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)
		5.2.3	Ensure that this species is included in site management documents for all relevant SSSIs. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered.	5.2.4	Consider notifying sites supporting viable populations of Homonotus sanguinolentus as SSSIs, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
2.	Current factors causing loss or decline	5.3	Species management and protection
2.1	Loss of southern heathland, especially grass-heath.	5.3.1	If necessary to maintain 10 viable populations, undertake habitat restoration and/or re-introductions at suitable former or potential sites. (ACTION: EN)
2.2	Scrub and bracken development.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
3.1	Most of the localities where this species has been recorded are SSSIs. The New Forest is a proposed SAC.	5.5	Future research and monitoring
3.2	This species is the subject of an EN Pre-Recovery Programme.	5.5.1	Undertake surveys to determine the status of the wasp by 2005. (ACTION: EN)
4.	Action plan objectives and targets	5.5.2	Promote ecological research to establish the habitat requirements of this species, the factors limiting breeding success at existing sites, and its dispersal ability. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5.3	Establish a regular monitoring programme for the species. (ACTION: EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
4.3	Restore populations to suitable sites to maintain 10 viable populations within the historic range by 2010.		
5.	Proposed action with lead agencies		
	This species is under threat due to loss of open, warm grasslands and heathland, with slightly damp areas present. The priority action necessary to halt or reverse the decline of this species is to continue the Species Recovery Programme of autecological research, investigating the prey (including the prey autecology) and nesting requirements of the species, together with		

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland heathland, including: the ground beetles *Amara famelica*, *Cicindela sylvatica* and *Pterostichus kugellani*; the aculeate wasps *Chrysis fulgida* and *Pseudepipona herrichii*; and the flies *Bombylius minor* and *Chrysotoxum octomaculatum*.
 - 5.7.2 This plan should be considered in conjunction with that for lowland heathland.

Nomada armata (a cuckoo bee)

Action Plan

1.	Current status	5.1	Policy and legislation
1.1	Nomada armata is a large, red cuckoo bee which lays its eggs in the nests of the mining bee Andrena hattorfiana. The host bee is closely associated with flowers of field scabious where it forages for the pollen with which to provision its nest. Nomada armata is also most often found on the flowers of the scabious. However, it uses these flowers for nectar supplies only. The host bee nest singly within grassland, sometimes in areas of exposed soil. Both Nomada armata and Andrena hattorfiana fly between June and early August.	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
		5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied and potential habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF, MoD)
1.2	There are confirmed records of Nomada armata from much of southern England and a single record from southern Wales. However, the majority of these records are from the 19th and early 20th centuries. There are six localities where this species has been found since 1990, all within the Salisbury Plain area of Wiltshire. These sites all have a calcareous soil, although they comprise both extensive chalk grasslands and marginal grassland areas along the edges of arable fields. The bee is widespread, but uncommon, in Europe as a whole.	5.2.2	Ensure that the habitat requirements of Nomada armata are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)
		5.2.3	Ensure that this species is included in site management documents for all relevant SSSIs. (ACTION: EN)
		5.2.4	Consider notifying sites supporting viable populations of Nomada armata as SSSIs, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
1.3	In Great Britain this species is classified as Vulnerable.	5.3	Species management and protection
2.	Current factors causing loss or decline	5.3.1	If necessary to maintain 10 viable populations, undertake habitat restoration and/or re-introductions at suitable former or potential sites. (ACTION: CCW, EN)
2.1	Loss of calcareous grasslands due to agricultural improvement.		
2.2	Inappropriate grazing management.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
3.1	All recent localities are within the Salisbury Plain SSSI, some on MoD property.	5.4.2	As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Maintain populations at all known sites.	5.5.1	Undertake surveys to determine the status of the bee by 2005. (ACTION: CCW, EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.2	Promote ecological research to establish the habitat requirements of this species, the factors limiting breeding success at existing sites, and its dispersal ability. (ACTION: EN)
4.3	Restore populations to suitable sites to maintain 10 viable populations within the historic range by 2010.	5.5.3	Establish a regular monitoring programme for the species. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation
	This cuckoo bee is under threat due to loss of open grasslands with stands of field scabious, which support populations of its host bee. The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen and nesting requirements, together with the dispersal ability, of both species. This will need to be followed by a programme of informed habitat management.		

into national and international databases.
(ACTION: CCW, EN)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet.
(ACTION: EN)

5.7 Links with other action plans

5.7.1 Implementation of this action plan could benefit the bumblebees *Bombus humilis*, *B. ruderatus*, *B. subterraneus* and *B. sylvarum*.

5.7.2 This plan should be considered in conjunction with that for lowland calcareous grassland.

Nomada errans (a cuckoo bee)

Action Plan

1.	Current status	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
1.1	Nomada errans is a species of cuckoo bee that is presumed to be the special cleptoparasite of the mining bee <i>Andrena nitidiusculus</i> . The host bee is widespread, but local, in southern England, being found in grassland habitats on both chalk and sand. It collects its pollen from various plant species in the family Apiaceae, notably wild carrot and hogweed, and nests solitarily or in small aggregations on patches of bare ground.	5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2008, for example through agri-environment scheme management agreements. (ACTION: EN, MAFF)
1.2	Nomada errans is known in the UK from 1 ten km square only, comprising the rough limestone grasslands and landslips in the area around Durlston Head, Dorset. This is despite the host bee's widespread distribution along the south coast of England. The cuckoo bee has apparently never been common, and only 19 specimens have ever been caught, nearly all of which are known to be extant in collections. The most recent capture is of a female at Anvil Point on 26 July 1982. Recent investigations at the site have failed to rediscover the species. The bee is apparently on the extreme northern edge of its European range, where it is predominantly a southern species, occurring as far north as Poland and Germany.	5.2.2	Ensure that the habitat requirements of <i>Nomada errans</i> are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)
		5.2.3	Ensure that this species is included in site management documents for the South Dorset Coast SSSI. (ACTION: EN)
		5.3	Species management and protection
		5.3.1	None proposed.
		5.4	Advisory
		5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered.		
2.	Current factors causing loss or decline	5.5	Future research and monitoring
2.1	Coastal cliff stabilisation	5.5.1	Promote ecological research to establish the habitat requirements of this species and its host, the factors limiting breeding success at existing sites, and its dispersal ability. (ACTION: EN)
2.2	Scrub encroachment.		
3.	Current action	5.5.2	Establish a regular monitoring programme for the species. (ACTION: EN)
3.1	The solitary population is at the eastern extremity of the South Dorset Coast SSSI.	5.5.3	Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
4.	Action plan objectives and targets	5.6	Communications and publicity
4.1	Maintain the population at its known site.	5.6.1	Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
4.2	Enhance the population size at its known site by 2010.	5.7	Links with other action plans
5.	Proposed action with lead agencies	5.7.1	This action plan should be considered in conjunction with those for lowland calcareous grassland, and maritime cliffs and slopes.
	This cuckoo bee is under threat due to loss of open grasslands with stands of umbelliferous flowers, which support populations of its host bee. The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen and nesting requirements, together with dispersal ability, of both species. This will need to be followed by a programme of informed habitat management.		
5.1	Policy and legislation		

Osmia inermis (a mason bee)

Action Plan

1.	Current status	5.1.1	Where appropriate, include the requirements of <i>Osmia inermis</i> when preparing or revising prescriptions for agri-environment schemes. (ACTION: SNH, SOAEFD)
1.1	<p><i>Osmia inermis</i> is one of a small group of boreo-alpine species of bee found in the UK. All nesting sites found in Scotland have been in the altitude range 300 to 600 m, although there are some earlier records from lower areas. Nests have been found in calcareous areas in short, dry, heathery turf which was closely grazed and had a high proportion of lichens present. The surrounding vegetation included numerous plants of bird's-foot trefoil, on which the females forage for pollen. Nests, which may be the work of several bees, are built under stones lying on the surface of the ground, and probably in narrow crevices in rock. All nesting sites need to be in full exposure to the sun. The cuckoo wasp <i>Chrysura hirsuta</i> is known to be a parasitoid on the larvae of this bee.</p>	5.1.2	Take account of the requirements of <i>Osmia inermis</i> when considering Woodland Grant Scheme, and other forestry scheme, applications. (ACTION: FC, SNH)
		5.2	Site safeguard and management
		5.2.1	Ensure that the species is included in management documents for all relevant SSSIs. (ACTION: SNH)
		5.2.2	Consider notifying as SSSIs sites supporting viable populations of <i>Osmia inermis</i> , where this is necessary to secure their long-term protection and appropriate management. (ACTION: SNH)
1.2	<p>This bee has a circumpolar distribution, being found at low altitudes north of the Arctic circle and in montane locations farther south. All UK records of <i>O. inermis</i> are from the north of the central lowland belt of Scotland. There are old records from Speyside but more recent records are confined to Perthshire.</p>	5.3	Species management and protection
		5.3.1	None proposed.
		5.4	Advisory
		5.4.1	Advise landowners and managers of the presence and this bee and the importance of beneficial management for its conservation. (ACTION SNH)
1.3	In Great Britain this species is classified as Vulnerable.		
2.	Current factors causing loss or decline	5.5	Future research and monitoring
2.1	<p>Loss of herb-rich grasslands with short swards through agricultural intensification, commercial afforestation or cessation of grazing.</p>	5.5.1	Undertake surveys to determine the current status of the bee by 2005. (ACTION: SNH)
2.2	<p>As a species with a boreo-alpine distribution, it could be negatively affected by warming of the UK climate.</p>	5.5.3	Conduct targeted autecological research to inform habitat management. (ACTION: SNH)
3.	Current action	5.5.3	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: SNH)
3.1	Some of the sites are on SSSIs.		
4.	Action plan objectives and targets	5.6	Communications and publicity
4.1	Maintain populations at all known sites.	5.6.1	Promote opportunities for the appreciation of this bee and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: SNH)
5.	Proposed action with lead agencies	5.7	Links with other action plans
	<p>This bee is under threat from the loss of suitable habitat, especially on upland calcareous grasslands. The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen, nesting, mating and overwintering requirements of the species. This will need to be followed by a programme of informed habitat management.</p>	5.7.1	Implementation of this action plan could benefit other species of the habitat, including the wasp <i>Chrysura hirsuta</i> , and the bee <i>Osmia parietina</i> .
5.1	Policy and legislation	5.7.2	This plan should be considered in conjunction with that for upland calcareous grassland.

Osmia parietina (a mason bee)

Action Plan

1.	Current status	5.1	Policy and legislation
1.1	Osmia parietina is one of a small group of boreo-alpine species of bee found in the UK. It nests in cavities within a variety of substrates, including dry-stone walls and holes in dead wood. There is a close association with bird's-foot trefoil, which is probably the main source of pollen. All nesting sites need to be in full exposure to the sun. The cuckoo wasp <i>Chrysurahirsuta</i> is known to be parasitic upon this bee on the continent, and it is likely that this is also true in the UK.	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes, including the sympathetic maintenance of dry-stone walls. (ACTION: CCW, EN, MAFF, SNH, SOAEFD, WOAD)
1.2	<i>O. parietina</i> is widespread in Eurasia, but with a markedly boreo-alpine distribution. Within Britain it is the most widespread of the three northern <i>Osmia</i> species. There are widely scattered records from the west and north of Britain, although there are no records from Northern Ireland. Adults were seen at two sites on the Llyn Peninsula, Caernarvonshire in 1998, and there are several records from Merionethshire in North Wales during the 1970s and one from Pembrokeshire in 1979. Otherwise, one specimen was found at Killiecrankie, Perthshire, during the 1980s and two populations are currently known in northern England at Gait Barrows NNR and Carnforth Iron Works.	5.2	Site safeguard and management
		5.2.1	Where possible, ensure that occupied and nearby potential habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, SNH, SOAEFD, WOAD)
		5.2.2	Ensure that the habitat requirements of the species are taken into account in relevant development policies, plans and proposals. (ACTION: CCW, EN, LAs, SNH)
		5.2.3	Ensure that this species is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN, SNH)
		5.2.4	Consider notifying as SSSI sites supporting viable populations of <i>Osmia parietina</i> , where this is necessary to secure their long-term protection and appropriate management. (ACTION: CCW, EN, SNH)
1.3	In Great Britain <i>O. parietina</i> is classified as Rare.		
2.	Current factors causing loss or decline	5.3	Species management and protection
2.1	Agricultural intensification of upland herb-rich pastures.	5.3.1	If necessary to ensure that there are 20 viable populations, undertake habitat restoration and/or reintroductions at suitable former or potential sites. (ACTION: CCW, EN, SNH)
2.2	Destruction of dry-stone walls.		
2.3	Inappropriate management of pasture woodlands.		
3.	Current action	5.4	Advisory
3.1	There are populations on the Gait Barrows NNR and RSPB reserve at Killiecrankie.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, EN, SNH)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Enhance the population size at all known sites by 2010	5.5.1	Undertake surveys to determine the current status of the bee by 2005. (ACTION: CCW, EN, SNH)
4.2	Ensure that there are 20 viable populations within the historic range by 2010.	5.5.2	Promote autecological research targeted to inform habitat management. (ACTION: CCW, EN, SNH)
5.	Proposed action with lead agencies	5.5.3	Establish a regular monitoring programme for the species. (ACTION: CCW, EN, SNH)
	The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen and nesting requirements of the species, together with its dispersal ability. This will need to be followed by a programme of informed habitat management of existing and potential sites.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN, SNH)
		5.6	Communications and publicity

- 5.6.1 Promote opportunities for the appreciation of this bee and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: CCW, EN, SNH)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit the cuckoo wasp *Chrysura hirsuta*, and the mason bees *Osmia inermis* and *Osmia uncinata*.
 - 5.7.2 This plan should be considered in conjunction with those for upland oak woods, limestone pavement, and upland calcareous grassland.

Osmia uncinata (a mason bee)

Action Plan

1.	Current status	5.1.1	Include specific targets and management for <i>Osmia uncinata</i> in Forest Design Plans across the species' current and former range. (ACTION: FE)
1.1	<p><i>Osmia uncinata</i> is one of a small group of boreo-alpine bees found in the UK. All records have come from areas of high forest, with open glades and dead wood present. Although primarily associated with areas of Caledonian pine forest, old plantation areas with a similar high forest structure are also suitable where they have a varied ground flora. No nests have been found in the UK, but elsewhere nesting is reported to be under pine bark on standing and fallen timber. All nesting sites are likely to need full exposure to the sun. The females forage for pollen on bird's-foot trefoil and nectar from other plants, including bilberry and broom. The cuckoo wasp <i>Chrysurus hirsuta</i> has been found in areas where <i>O. uncinata</i> is present, and is probably a parasitoid of the larvae of this species.</p>	5.1.2	Take account of the requirements of <i>Osmia uncinata</i> when considering grant scheme (eg Woodland Grant Scheme) applications for woodland planting, natural regeneration, and changes in grazing on or near occupied sites. (ACTION: FC, SNH)
1.2	<p>This bee has a boreo-alpine distribution in the Western Palearctic and is associated with coniferous forests. All records of this bee are from the north of the central lowland belt of Scotland. The bee has been recorded from 9 ten kms squares since 1904. There are post-1980 records from four of these ten km squares.</p>	5.2	Site safeguard and management
		5.2.1	Ensure that the species is included in site management documents for all relevant SSSIs and NNRs, including Abernethy. (ACTION: SNH)
		5.2.2	Consider notifying as SSSI sites supporting viable populations of <i>Osmia uncinata</i> , where this is necessary to secure their long-term protection and appropriate management. (ACTION: SNH)
1.3	In Great Britain this bee is classified as Vulnerable.	5.3	Species management and protection
2.	Current factors causing loss or decline	5.3.1	None proposed.
2.1	Loss of sites with dead pine wood and suitable open glades.	5.4	Advisory
2.2	As a species with a boreo-alpine distribution, it could be negatively affected by warming of the UK climate.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: SNH)
		5.4.2	Develop and disseminate guidelines to protect <i>Osmia uncinata</i> for use with landowners; local authority, RSPB and SNH area staff. (ACTION: LAs, FC, SNH)
3.	Current action	5.5	Future research and monitoring
3.1	Some of the recent records are from SSSIs. The bee is also present on the RSPB reserve at Abernethy Forest.	5.5.1	Undertake surveys to determine the current status of the bee by 2005. (ACTION: SNH)
4.	Action plan objectives and targets	5.5.2	Conduct autecological research targeted to inform habitat management. (ACTION: SNH)
4.1	Maintain populations at all known sites.	5.5.3	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: SNH)
5.	Proposed action with lead agencies	5.6	Communications and publicity
	<p>This bee is under threat from the loss of suitable habitat in coniferous woodland. The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen, nesting, mating and overwintering requirements of the species. This will need to be followed by a programme of informed habitat management.</p>	5.6.1	Promote opportunities for the appreciation of <i>Osmia uncinata</i> and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: FC, SNH)
		5.7	Links with other action plans
5.1	Policy and legislation	5.7.1	Implementation of this action plan could benefit other species of the habitat, including the cuckoo wasp

Chrysura hirsuta, the hoverfly *Blera fallax*,
and the spider *Clubiona subsultans*.

- 5.7.2 This plan should be considered in conjunction with that
for native pine woodland.

Osmia xanthomelana (a mason bee)

Action Plan

1.	Current status	4.3	Restore populations to suitable sites to maintain five viable populations within the historic range by 2010 and 20 viable populations in the long term.
1.1	Osmia xanthomelana is a large mason bee with a conspicuous covering of tawny hair. It builds its nest cells from mud pellets which it gathers at seepage areas on cliffs and banks. The nest is constructed either at the base of grass tussocks or in ready-made cavities. The cells are provisioned with pollen gathered from bird's-foot trefoil or horseshoe vetch. The flight period is from May to July. This species is typical of a number of insect species which are closely associated with the south-facing, soft-rock cliffs of southern England.	5.	Proposed action with lead agencies
1.2	Osmia xanthomelana is probably our rarest solitary bee, there being post-1970 records from only 3 ten km squares. Two localities are on soft-rock coastal cliffs in the Isle of Wight and the third is on soft-rock coastal cliffs of the Lleyn Peninsula in North Wales. Even at its main location on the Isle of Wight it is difficult to find, with an estimated population of fewer than 50 individuals in any one year. It was formerly distributed widely in England and Wales, with a total of 21 ten km squares recorded, although most records are from the 19th and early 20th centuries. It has never been considered a common species. It is rare and sporadic in southern and central Europe.	5.1	This species is under threat due to loss of open, south-facing, soft-rock cliffs on the coast of southern Britain. The priority action necessary to halt or reverse the decline of this species is to establish a programme of autecological research, investigating the nectar, pollen and nesting requirements of the species, together with its dispersal ability. This will need to be followed by a programme of informed habitat management.
1.3	In Great Britain this species is classified as Endangered.	5.1.1	Policy and legislation
2.	Current factors causing loss or decline	5.1.1	Incorporate the requirements of Osmia xanthomelana in relevant Shoreline Management Plans. (ACTION: LAs, MAFF)
2.1	Cliff stabilisation.	5.1.2	Where appropriate, include the requirements of the species when preparing or revising prescriptions for relevant agri-environment schemes. (ACTION: CCW, EN, MAFF, WOAD)
2.2	Intensification of agricultural systems at the top of soft-rock cliffs, leading to increased nutrient input to the cliff faces as fertilised agricultural land makes its way down the cliff. This increased input of nutrients results in a coarsening of the vegetation, and rapid shading out of both nesting areas and forage plants.	5.2	Site safeguard and management
2.3	Scrub encroachment.	5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2008, for example through agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, WOAD)
3.	Current action	5.2.2	Ensure that the habitat requirements of Osmia xanthomelana are taken into account in relevant coastal protection and development policies, plans and proposals. (ACTION: CCW, EN, LAs)
3.1	This species has been the subject of an EN Species Pre-Recovery Project which has led to limited habitat management at its major known site on the Isle of Wight.	5.2.3	Ensure that this species is included in site management documents for any relevant SSSIs. (ACTION: CCW, EN)
3.2	CCW commissioned a survey of former localities and suitable habitat on the Lleyn Peninsula in 1995.	5.2.4	Consider notifying sites supporting viable populations of Osmia xanthomelana as SSSIs, where this is necessary to secure their long-term protection and appropriate management. (ACTION: CCW, EN)
4.	Action plan objectives and targets	5.3	Species management and protection
4.1	Maintain populations at all known sites.	5.3.1	If necessary to maintain five viable populations, undertake habitat restoration and/or re-introductions at suitable former or potential sites. (ACTION: CCW, EN)
4.2	Enhance the population size at all known sites by 2010.	5.4	Advisory
		5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, EN)

- 5.5 Future research and monitoring
 - 5.5.1 Undertake further surveys to determine the status of the bee by 2005. (ACTION: CCW, EN)
 - 5.5.2 Promote ecological research to establish the habitat requirements of this species, the factors limiting breeding success at existing sites, its dispersal ability, and appropriate reintroduction methods. (ACTION: CCW, EN)
 - 5.5.3 Establish a regular monitoring programme for the species. (ACTION: CCW, EN)
 - 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: CCW, EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of coastal soft-rock cliffs, including the solitary bee *Lasioglossum angusticeps*, and the tiger beetle *Cicindela germanica*.
 - 5.7.2 This plan should be considered in conjunction with that for maritime cliffs and slopes.

Purbeck mason wasp (*Pseudepipona herrichii*) Action Plan

1.	Current status	5.	Proposed action with lead agencies
1.1	<p>The Purbeck mason wasp is a large, red, black-and-yellow mason wasp which provisions its nest with the caterpillars of a tortricid moth which feeds on heathers. The host caterpillar is commonest on plants of bell heather <i>Erica cinerea</i> in early- to mid-successional heathland. The flowers of bell heather are also the major nectar source for the adult wasps. The nest of the Purbeck mason wasp is dug in areas of bare, clayey ground within heathlands. The wasp flies between May and July.</p>		<p>This species is under threat due to loss of heathland. Losses in the past have been due to succession, commercial forestry plantation and agricultural intensification. Of these causes, only succession is likely to be a current threat to six of the extant colonies which are on SSSIs, and a priority for the species is to adopt management practices to address this potential threat on occupied or potential sites. Research into the management techniques required to attain the desired composition and height of bell heather is required.</p>
1.2	<p>This mason wasp has long been known to be restricted to a few lowland heathland sites in the Poole Basin area of Dorset. By the outbreak of the Second World War, it was known from seven different heathlands. Since the late 1940s, the range has contracted and, after the loss of the Stoborough Heath population in about 1980, the only remaining site appeared to be on Godlingston Heath NNR. A survey of clay exposures on Dorset heathlands carried out in 1995 and 1996 failed to find any further breeding sites for the species. In 1997, the monitoring programme revealed that the population size on Godlingston Heath had reached a very high level and, at the same time, new nesting aggregations were discovered on six other heathlands, all within the historic range of the species. The wasp is reported to be widespread in Europe. Although recent records from the near continent are lacking, it is not uncommonly found in the Mediterranean region (Turkey, Greek islands, France, Spain and Morocco). It is also reported from Canada, but the true status of this taxon remains uncertain.</p>	5.1	Policy and legislation
		5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
		5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF)
		5.2.2	Ensure that the habitat requirements of the Purbeck mason wasp are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)
		5.2.3	Ensure that this species is included in site management documents for all relevant SSSIs. (ACTION: EN)
		5.2.4	Consider notifying sites supporting viable populations of the Purbeck mason wasp as SSSIs, where this is necessary to secure their long term protection and appropriate management. (ACTION: EN)
1.3	In Great Britain this species is classified as Vulnerable.		
2.	Current factors causing loss or decline		
2.1	Succession on heathland.	5.3	Species management and protection
3.	Current action	5.3.1	If necessary to maintain ten viable populations, undertake habitat restoration and/or re-introductions at suitable former or potential sites. (ACTION: EN)
3.1	The wasp became part of EN's Species Recovery Programme in 1996.	5.4	Advisory
3.2	Six of the seven colonies recorded in 1997 are on SSSIs; the seventh is just outside one.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.	Action plan objectives and targets		
4.1	Maintain populations at all known sites.	5.5	Future research and monitoring
4.2	Enhance the population size at all known sites by 2010.	5.5.1	Continue ecological research to establish the habitat requirements of this species and its prey, the factors limiting breeding success at existing sites, and its dispersal ability. (ACTION: EN)
4.3	Restore populations to suitable sites to maintain ten viable populations within the historic range by 2010.		

- 5.5.2 Continue the current regular monitoring programme. (ACTION: EN)
- 5.5.3 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit for other species of lowland heath, including: the ground beetles *Amara famelica*, *Cicindela sylvatica* and *Pterostichus kugellani*; the aculeate wasps *Chrysis fulgida* and *Homonotus sanguinolentus*; and the flies *Bombylius minor* and *Chrysotoxum octomaculatum*.
 - 5.7.2 This plan should be considered in conjunction with that for lowland heathland.

Chrysurina hirsuta (a cuckoo wasp) Species Statement

1. Current status

1.1 The wasp *Chrysurina hirsuta* is one of a small group of boreo-alpine species of aculeate Hymenoptera found in the UK. This wasp is a specialist parasitoid of the larvae of mason bees of the family Megachilidae. It is known to parasitise *Osmia inermis* in Scotland, whilst elsewhere in Europe it has also been recorded as a parasite of *Osmia uncinata*. In Scotland the hosts occur in upland base-rich grassland and Caledonian pine woodland respectively. It is possible that *Osmia parietina*, the third northern megachilid bee found in the UK, is also a host of this wasp in Scotland.

1.2 This wasp has a boreo-alpine distribution in the Palearctic. Since 1849 this wasp has been recorded from three widely separated areas of Scotland: Blair Atholl (Perthshire), Whithorn (Kirkcudbrightshire) and from Strathspey. There are modern (post-1970) records for all three areas.

1.3 In Great Britain this wasp is now classified as Rare.

2. Current factors causing loss or decline

2.1 Loss of herb-rich grasslands with short swards through agricultural intensification, commercial afforestation or cessation of grazing.

2.2 Loss of dead wood and suitable open glades in Caledonian pine woods.

2.3 As a species with a boreo-alpine distribution, it could be negatively affected by warming of the UK climate.

3. Current action

3.1 Some of the records are from SSSIs and it also occurs on the RSPB reserve at Abernethy Forest.

4. Objective for the species

4.1 Maintain the range of *Chrysurina hirsuta*.

5. Proposed action

5.1 Monitoring only. The species could benefit from the action plans for its host bees *Osmia inermis*, *O. uncinata* and, probably, *O. parietina*. Its requirements should be considered in the implementation of the upland calcareous grassland and native pine woodland action plans.

Evagetes pectinipes (a spider-hunting wasp)

Species Statement

1 Current status

- 1.1 Evagetes pectinipes is a spider-hunting wasp which is presumed to steal spiders from other spider-hunting wasps, most probably Episyrphus rufipes, which is a common species of open dunes and sandy heaths.
- 1.2 The wasp is known in Britain from only 2 ten km squares on the extensive Deal to Sandwich sand-dune systems of eastern Kent. It was first recognised as a British species from a female taken at Deal in 1966, and has been recorded at the same site on a number of occasions since. The absence of the species in extensive old collections from the current site has led to a suggestion that the species may be a recent colonist from continental mainland Europe. Evagetes pectinipes is not uncommon in the Channel Islands (Jersey and Guernsey) and is widespread in mainland Europe (except the south), its range extending eastwards to the Middle East.
- 1.3 In Great Britain this species is classified as Endangered.

2. Current factors causing loss or decline

- 2.1 Not known.

3. Current action

- 3.1 At least part of the British population occurs on the Sandwich Bay to Hacklinge Marshes SSSI.

4. Objective for the species

- 4.1 Maintain existing populations of Evagetes pectinipes.

5. Proposed action

- 5.1 Monitoring only. It is likely that the species may benefit from the action plans for other species of coastal sand dunes, including the click beetle Melanotus punctolineatus. The requirements of the species should be considered in the implementation of the coastal sand dunes action plan.

Lasioglossum angusticeps (a solitary bee)

Species Statement

1. Current status

1.1 Lasioglossum angusticeps is a small, black mining bee which is difficult to separate from its close relative, *L. punctatissimum*. Males are required for reliable identification. Circumstantial evidence suggests that females provision their nests with pollen from bird's-foot trefoil. The bee nests gregariously in open situations exposed to the sun, particularly on areas of clay which have slumped at the base of cliffs. It is typical of a number of insect species which are closely associated with the south-facing, soft-rock cliffs of southern England. This habitat is prone to constant local changes through natural landslipping and cliff falls, providing a dynamic matrix of bare ground and pioneer vegetation which is open to the heating influence of the sun. Lasioglossum angusticeps flies between late May to September.

1.2 The species has a very restricted distribution in the UK. It is found only along the soft-rock coastal cliffs between the Isle of Wight (Niton) and eastern Devon (Sidmouth). Where found, it may be locally common. It is rare and sporadic in southern and central Europe.

1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

2.1 Cliff stabilisation.

2.2 Intensification of agricultural systems at the top of soft-rock cliffs, leading to increased nutrient input to the cliff faces as fertilised agricultural land makes its way down the cliff. This increased input of nutrients results in a coarsening of the vegetation and rapid shading out of both nesting areas and forage plants.

2.3 Scrub encroachment.

3. Current action

3.1 Some populations occur on SSSIs.

4. Objective for the species

4.1 Maintain the range of *Lasioglossum angusticeps*.

5. Proposed action

5.1 Monitoring only. It is likely that the species will benefit from the action plans for other species of coastal soft-rock cliffs, including the solitary bee *Osmia xanthomelana* and the tiger beetle *Cicindela germanica*. The requirements of the species should be considered in the implementation of the maritime cliffs and slopes action plan.

Nomada ferruginata (= N. xanthosticta) (a cuckoo bee)

Species Statement

1. Current status
 - 1.1 *Nomada ferruginata* is a species of cuckoo bee that is the special cleptoparasite of the early spring mining bee *Andrena praecox*. The host bee is strongly associated with the male flowers of sallows, which provide the only pollen source for provisioning the nest cells. Nest burrows of the host bee are constructed, usually singly, in patches of bare ground.
 - 1.2 *Nomada ferruginata* is known to be widely distributed throughout southern England, with 21 confirmed ten km squares, of which nine are post 1970. Old records from Manchester, Northumberland and eastern Scotland may be misidentifications. Despite the continued relative abundance of the host bee, *Nomada ferruginata* appears to have declined significantly since 1945. There has, however, been an increase in the number of records since the mid 1980s, with populations being found in Wiltshire, Hampshire, Suffolk, Essex, Kent and Warwickshire. It is a northern and central European species, becoming more sparsely distributed in the south.
 - 1.3 In Great Britain this species is classified as Endangered.
2. Current factors causing loss or decline
 - 2.1 Not known.
3. Current action
 - 3.1 Some populations are on SSSIs.
4. Objective for the species
 - 4.1 Maintain the range of *Nomada ferruginata*.
5. Proposed action
 - 5.1 Monitoring only.

Lepidoptera



Reddish buff (*Acosmetia caliginosa*)

Action Plan

1.	Current status	effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.
1.1	The reddish buff is a moth whose sole larval foodplant is saw-wort <i>Serratula tinctoria</i> . Its preferred breeding habitat is open grassy, often heathy, swards rich in saw-wort, but neither strongly acidic nor strongly alkaline. Most larvae have been found in sward heights of 5-15 cm.	5.1 Policy and legislation
1.2	This moth has been recorded from several sites in Hampshire and on the Isle of Wight. In Hampshire it had been lost from the New Forest by the 1930s, and from the county as a whole in the 1960s. On the Isle of Wight three sites had been lost by 1980, another was lost during the 1980s, and now a single native population remains. The reddish buff has a very local but scattered distribution in Europe which extends eastwards into Asia.	5.1.1 Where appropriate, include the requirements of the reddish buff when preparing or revising prescriptions for agri-environment and woodland grant schemes. (ACTION: EN, FC, MAFF)
1.3	In Great Britain this moth is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.	5.2 Site safeguard and management
2.	Current factors causing loss or decline	5.2.1 Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2003, for example through SSSI or agri-environment scheme management agreements. (EN, MAFF)
2.1	Establishment of conifer plantations on open heathland.	5.2.2 Ensure that the habitat requirements of the reddish buff are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)
2.2	Scrub encroachment due to insufficient browsing, grazing and clearance.	5.2.3 Where possible, increase the available habitat at known sites and in adjacent areas, and attempt to link up existing fragments of habitat. At least 5 ha of suitable habitat at each established population of the moth should be restored by 2010. (ACTION: FC, EN)
3.	Current action	5.2.4 Consider notifying as SSSI sites holding key populations of the species, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
3.1	The species has been the subject of an EN Species Recovery Programme project since 1992.	5.3 Species management and protection
3.2	A captive breeding programme with the Federation of Zoological Gardens has been underway since 1993.	5.3.1 Continue the cooperative captive breeding project with the Federation of Zoological Gardens to produce sufficient captive stock for establishment trials. (ACTION: EN)
3.3	A species action plan, commissioned by EN, was prepared in 1995.	5.3.3 Consider (re)introducing the reddish buff to former or potential sites if necessary to restore 10 viable populations by 2005. (ACTION: EN)
4.	Action plan objectives and targets	5.4 Advisory
4.1	Maintain the sole natural population and any newly discovered or naturally re-established populations.	5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.2	Restore the species to at least 10 viable populations within its former range in Britain by 2005.	5.5 Future research and monitoring
5.	Proposed action with lead agencies	5.5.1 Undertake surveys of all potential habitat in order to locate any surviving colonies by 2005. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat (if necessary with introductions of the species) to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the	5.5.2 Conduct autecological research on the moth's population biology and requirements, including the effects of habitat management. (ACTION: EN)

- 5.5.3 Establish a regular monitoring programme for the species. (ACTION: EN)
- 5.5.4 Pass information gathered during survey and monitoring of this moth to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.5.5 Encourage research on the status, autecology, conservation and genetics of this species throughout its international range and share the results to further its conservation. (ACTION: EN, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This plan should be considered in conjunction with that for lowland heathland.

Straw belle (*Aspitates gilvaria*) Action Plan

1.	Current status	5.2	Site safeguard and management
1.1	The straw belle is a moth of chalk grasslands, where the larva feeds on various low-growing herbs.	5.2.1	Ensure that all occupied habitat is appropriately managed by the year 2005, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF)
1.2	The moth has declined severely and is now confined to small fragments of the North Downs of Surrey and Kent. Formerly the moth has been reported from Devon, Somerset, Gloucestershire, Hampshire, the Isle of Wight, Sussex, Middlesex and Cheshire. Some of these records are of suspected migrants, but others are of colonies which are now extinct. This moth has been recorded locally from most of the countries in Europe, but it reaches its northern limit in Fenno-Scandia. Its range extends across Asia to Mongolia.	5.2.2	Ensure that the habitat requirements of the straw belle are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
		5.2.3	Encourage an increase in suitable habitat on occupied sites and attempt to link up existing fragments by restoring sites throughout the former range of the moth. (ACTION: EN)
1.3	In Great Britain this species is classified as Rare.	5.2.4	Ensure that the straw belle is included in site management documents for all relevant SSSIs. (ACTION: EN)
2.	Current factors causing loss or decline	5.2.5	Consider notification of breeding sites as SSSIs, where this is considered necessary to secure their long-term protection and appropriate management. (ACTION: EN)
2.1	Habitat loss due to road construction, development, and agricultural improvement of unimproved calcareous grassland.	5.3	Species management and protection
2.2	Inappropriate grazing management.	5.3.1	Consider (re)introducing to a series of sites within the former range if necessary to restore five populations by 2005. (ACTION: EN)
2.3	Accidental and deliberate burning of grasslands supporting this species.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
3.1	Most remaining sites are on SSSIs.	5.4.2	As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance and the management needed for its conservation. (ACTION: EN, MAFF)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Maintain all existing populations.	5.5.1	Undertake surveys of occupied and potential sites by 2005. (ACTION: EN)
4.2	Restore five populations within its former range by 2005.	5.5.2	Conduct autecological research to determine the precise habitat requirements of the species by 2005. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.3	Establish a regular monitoring programme for the species. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat (if necessary with introductions of the species) to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
5.1	Policy and legislation		
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)		

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Marsh moth (*Athetis pallustris*) Action Plan

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|-----|--|---|
| 1. | Current status | ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation. |
| 1.1 | The marsh moth is a species of unimproved grassland on frequently waterlogged ground. The larvae feed on plantains <i>Plantago</i> spp. | |
| 1.2 | Formerly there were populations of the marsh moth in Huntingdonshire, Cambridgeshire, Norfolk, Suffolk, Yorkshire and Cumbria, with a single record in Hampshire, but the moth has not been seen in any of these counties since 1970. It is now confined to the coastal belt of Lincolnshire where it occurs on two nature reserves and possibly two additional sites. This moth has been reported as local from most European countries from Spain to the Balkans, and reaches its northern limit at the Arctic circle in Lapland. Its range extends to southern Russia, the Urals, Siberia and Mongolia. | 5.1 Policy and legislation
5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
5.2 Site safeguard and management
5.2.1 Ensure that all occupied and nearby potential habitat is appropriately managed by the year 2005, for example through uptake of agri-environment schemes. (ACTION: EN, MAFF)
5.2.2 Ensure that the habitat requirements of the marsh moth are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
5.2.3 Where possible, increase the available habitat on known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN)
5.2.4 Ensure that the marsh moth is included in site management documents for all relevant SSSIs. (ACTION: EN) |
| 1.3 | In Great Britain this species is classified as Rare. | |
| 2. | Current factors causing loss or decline | |
| 2.1 | Changes in land use including drainage and development. | |
| 2.2 | Heavy grazing. | |
| 3. | Current action | |
| 3.1 | Both of the main populations are on SSSIs which are also nature reserves. | 5.3 Species management and protection
5.3.1 Undertake an establishment trial at Woodwalton Fen. (ACTION: EN)
5.3.2 Consider the advisability of establishment trials elsewhere in the Huntingdonshire and Cambridgeshire fens, once former sites have been adequately surveyed, and provided that the causes of loss are no longer operating. (ACTION: EN) |
| 3.2 | There is a Species Recovery Project at one of the Lincolnshire sites which is jointly funded by EN and the Lincolnshire Trust for Nature Conservation. | |
| 4. | Action plan objectives and targets | |
| 4.1 | Maintain populations at all known sites. | |
| 4.2 | Enhance the population size at all known sites by 2010. | 5.4 Advisory
5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN) |
| 4.3 | Restore a self-sustaining population to at least one site (Woodwalton Fen) by 2010. | |
| 4.4 | Establish an ex situ programme to provide material for ecological research and, where necessary, for introduction to suitable sites. | 5.5 Future research and monitoring
5.5.1 Undertake surveys to determine the status of this species. (ACTION: EN)
5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: EN)
5.5.3 Establish a monitoring programme for the species on all occupied sites by 2005. (ACTION: EN) |
| 5. | Proposed action with lead agencies | |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the | |

- 5.5.4 Regularly assess potential sites to monitor the effectiveness of management agreements. (ACTION: EN)
- 5.5.5 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for coastal and floodplain grazing marsh.

Fiery clearwing (*Bembecia chrysidiformis*) Action Plan

1.	Current status	5.1.2	Address the requirements of the fiery clearwing in relevant Shoreline Management Plans. (ACTION: LAs, MAFF)
1.1	The fiery clearwing is restricted to warm south-facing slopes where the larvae feed in the roots of curled dock <i>Rumex crispus</i> and common sorrel <i>R. acetosa</i> , probably preferring larger, older plants. The adults visit flowers by day and rest on bare soil.	5.2	Site safeguard and management
1.2	This moth is at the northern edge of its range and currently breeds only on the coast between Folkestone and Dover in Kent. It was formerly found in Essex (until about 1860), Hampshire and Sussex, with occasional records elsewhere on the south coast. It is a central and southern species in Europe, occurring from the Mediterranean countries north to Belgium.	5.2.1	Increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.	5.2.2	Where possible, ensure that all occupied and potential nearby habitat is appropriately managed by 2001, for example through agri-environment scheme management agreements. (ACTION: EN, MAFF)
2.	Current factors causing loss or decline	5.2.3	Ensure that the habitat requirements of the fiery clearwing are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
2.1	Collecting, chiefly by uprooting the foodplant, is a major cause of decline of the remaining population.	5.2.4	Ensure that existing populations do not become fragmented by management practices or development. (ACTION: EN, LAs)
2.2	Scrub invasion.	5.3	Species management and protection
2.3	Spraying, cutting and clearance of stands of the foodplants.	5.3.1	None proposed.
3.	Current action	5.4	Advisory
3.1	The moth has been the subject of an EN Species Recovery Project since 1995.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Maintain populations at all known sites.	5.5.1	Map the precise areas of occupancy of the fiery clearwing and monitor the populations annually. (ACTION: EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.2	Investigate all new records of the species occurrence within the UK and all reports of potentially suitable habitat to locate any overlooked colonies of the moth. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.3	Regularly assess potential sites to monitor the effectiveness of management agreements. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.4	Conduct targeted autecological research to inform habitat management. (ACTION: EN)
5.1	Policy and legislation	5.5.5	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for environment schemes. (ACTION: EN, MAFF)	5.5.6	Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. The need to protect species such as the fiery clearwing from irresponsible collecting should be emphasised. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION:EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for maritime cliffs and slopes.

Chequered skipper (*Carterocephalus palaemon*) Action Plan

1.	Current status	University of Birmingham, and the French and Belgian authorities.
1.1	In Scotland, the chequered skipper is primarily a species of woodland edge and scrub. It occurs in areas of lightly grazed or ungrazed grassland, scrub and marsh around open broadleaved woodland, on wet but well-aerated soils. These areas are dominated by the larval food plant, purple moor-grass. Nectaring occurs in glades with bluebells and bugle. Males defend territories, usually located in warm, sheltered areas. Females may move several kilometres and can be widely scattered towards the end of the flight period.	4.
1.2	The chequered skipper is a boreal species that occurs across Europe, Asia and North America. It is declining in several European countries and is extinct in Denmark. It is endangered in some countries outside Europe (eg Japan). In England the chequered skipper was once fairly common in the East Midlands, but it became extinct there in the 1970s. The British populations are now restricted to about 50 sites in a small area of western Scotland. The known history of the species in Scotland is short as it was not documented here until 1942.	4.1
1.3	In Great Britain the chequered skipper is classified as Out of Danger. It is protected under Schedule 5 of the Wildlife and Countryside Act 1981, with respect to sale only.	4.2
2.	Current factors causing loss or decline	4.3
2.1	Inappropriate grazing management of wood pasture.	5.
2.2	Loss of open areas within woodland.	Proposed action with lead agencies
3.	Current action	In Scotland there will need to be regular surveys of all populations and monitoring of adult numbers on key sites. Beneficial management will be needed on key sites, including sites associated with commercial activities such as forestry plantations. Research is needed on the responses of populations to management of the woodland sites where it occurs. In England the objectives will be achieved by continuing the re-establishment programme with appropriate monitoring and research. Opportunities for re-establishing viable populations in England are limited by lack of suitable habitat in its former sites.
3.1	Many populations are on SSSIs or NNRs. One colony is on a Scottish Wildlife Trust Reserve.	5.1
3.2	Three populations of the chequered skipper in Scotland are monitored as a part of the National Butterfly Monitoring Scheme.	5.1.1
3.3	A species action plan, grant-aided by EN, CCW, SNH and WWF, was published by Butterfly Conservation in 1996.	Policy and legislation
3.4	Butterfly Conservation has produced a comprehensive site inventory, identifying 10 core areas in Scotland.	Take account of the requirements of the chequered skipper when considering grant applications (eg Woodland Grant Scheme, Countryside Premium Scheme, Farm Woodland Premium Scheme) for woodland planting, natural regeneration, and changes in grazing on or near chequered skipper sites. (ACTION: FC, SNH, SOAEFD)
3.5	A booklet describing conservation measures for the species was published jointly by Butterfly Conservation and SNH in 1996.	5.1.2
3.6	Butterfly Conservation initiated a reintroduction in England in 1995, in collaboration with FE, EN, the	Encourage financial incentives for coppice restoration and beneficial woodland management in the recent former range in the East Midlands. (ACTION: EN, FC)
		5.2
		5.2.1
		Discourage detrimental development proposals affecting known breeding areas. (ACTION: LAs, SNH)
		5.2.2
		In areas with populations of the butterfly, encourage positive management of forestry plantations and wayleaves associated with broadleaved woodland and incorporate requirements of the chequered skipper into Forest Design Plans and other management plans. (ACTION: FC, SNH)
		5.2.3
		Where possible, increase the available habitat at known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: FC, SNH)

- 5.2.4 Where there is realistic potential for re-establishment of this butterfly, promote restoration of potential habitats in the former range in England. (ACTION: EN, FC)
- 5.2.5 Ensure that the butterfly is included in site management documents for all relevant SSSIs and NNRs. (ACTION: SNH)
- 5.2.6 Consider notifying as SSSIs sites supporting viable populations of the chequered skipper, where this is necessary to secure their long-term protection and appropriate management. (ACTION: SNH)
- 5.3 Species management and protection
 - 5.3.1 Continue the re-establishment programme at the FE site in eastern England, with monitoring of the butterfly and its habitat. (ACTION: EN, FE)
 - 5.3.2 If suitable, appropriately managed, extensive habitats can be found or restored, conduct five further strategic reintroductions to England. (ACTION: EN, FC)
 - 5.3.3 Discourage collection of chequered skippers at all sites. (ACTION: EN, FE, SNH)
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of this butterfly and the importance of beneficial management for its conservation. (ACTION: EN, FC, SNH).
- 5.5 Future research and monitoring
 - 5.5.1 Monitor key populations in Scotland, either by standard transects or timed counts, and collate data annually to compare trends with changes in site condition. (ACTION: SNH)
 - 5.5.2 Undertake regular surveys in Scotland to confirm the status of all known breeding areas and to confirm the range of the species. (ACTION: SNH)
 - 5.5.3 Conduct targeted autecological research to inform habitat management. (ACTION: EN, FC, SNH)
 - 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN, SNH)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the chequered skipper and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: EN, FC, SNH)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of the habitat, including the pearl-bordered fritillary *Boloria euphrosyne*.
 - 5.7.2 This plan should be considered in conjunction with those for purple moor-grass and rush pastures, and upland oak woods.

Light crimson underwing (*Catocala promissa*) Action Plan

1.	Current status	5.1	Policy and legislation
1.1	The light crimson underwing requires large areas of mature oak woodland. The larva is dependent on oak (<i>Quercus</i> spp).	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment (farm woodland) and woodland grant schemes. (ACTION: EN, FC, MAFF)
1.2	This moth is now confined to the New Forest and two large woodlands in north Hampshire and south Wiltshire. Formerly there were populations northwards to Buckinghamshire and eastwards to Huntingdonshire and Sussex, some surviving into the 1950s or later. The moth has been reported from every country in Europe except Ireland, Malta and Albania. It is locally widespread in southern and central Europe, becoming increasingly local and rare northwards. Its range extends eastwards to Siberia and southwards to Iran and North Africa.	5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2005, for example through SSSI or agri-environment/woodland grants scheme management agreements. (ACTION: EN, FC, MAFF)
		5.2.2	Ensure that existing populations do not become fragmented by management practices or development. (ACTION: EN)
1.3	In Great Britain this species is classified as Rare.	5.2.3	Increase the available habitat on the known sites and in adjacent woodland, and attempt to link up existing fragments of habitat, for example by replanting with oaks. (ACTION: EN, FE)
2.	Current factors causing loss or decline	5.2.4	Ensure that the habitat requirements of the species are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
2.1	The felling of large stands of mature oak, which is damaging even when replanting with oak.	5.2.5	Ensure that the light crimson underwing is included in site management documents for all relevant SSSIs. (ACTION: EN)
2.2	Replanting woodland with species other than oak, and the fragmentation of large blocks of oak woodland.	5.3	Species management and protection
3.	Current action	5.3.1	Undertake reintroductions into suitably restored former sites in South East and central England by 2010. (ACTION: EN)
3.1	Almost all of the surviving colonies are within the New Forest boundary or on nearby SSSIs. The New Forest is a candidate SAC.	5.4	Advisory
4.	Action plan objectives and targets	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5	Future research and monitoring
4.2	Enhance the population size at all known sites by 2010.	5.5.1	Undertake surveys to determine the status of the species. (ACTION: EN)
4.3	Initiate restoration of populations to three suitable sites within the historic range by 2010.	5.5.2	Conduct targeted autecological research to establish the requirements necessary to maintain viable populations of the light crimson underwing in the long term. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.3	Establish a regular monitoring programme for the species. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Progress towards the restoration of populations may be limited by the rate of tree growth at the sites chosen. Research will focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland oak woodlands, including the dark crimson underwing *Catocala sponsa*.
 - 5.7.2 This plan should be considered in conjunction with that for lowland wood pastures and parklands.

Dark crimson underwing (*Catocala sponsa*) Action Plan

1.	Current status	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for woodland grant schemes. (ACTION: EN, FC)
1.1	The dark crimson underwing requires large areas of mature oak woodland. The larva is dependent on oak <i>Quercus</i> spp.	5.2	Site safeguard and management
1.2	The dark crimson underwing is confined as a breeding species to the New Forest, Hampshire. Formerly there were colonies in south Wiltshire (until at least 1949) and the London area (in the 19th century). The species declined in the New Forest in the 1970s, but there was some resurgence in the mid 1980s and in 1995. Long-term fluctuations in the abundance of this species have been noted in the past. This moth has been recorded in virtually every country in Europe, but is often local and sometimes rare. It reaches Siberia in the north and occurs south to North Africa.	5.2.1	Where possible, ensure that all occupied and potential nearby habitat is appropriately managed by 2005, for example through site management agreements. (ACTION: EN)
		5.2.2	Increase the available habitat on the known sites and in adjacent woodland, and attempt to link up existing fragments of habitat, for example by replanting with oaks. (ACTION: EN, FE)
		5.2.3	Ensure that the habitat requirements of the species are taken into account in relevant development policies, plans and proposals, ensuring in particular that existing populations do not become fragmented. (ACTION: LAS)
1.3	In Great Britain this species is classified as Rare.	5.2.4	Ensure that the dark crimson underwing moth is included in site management documents on all relevant SSSIs. (ACTION: EN)
2.	Current factors causing loss or decline	5.3	Species management and protection
2.1	The felling of large stands of mature oak, which is damaging even when replanting with oak.	5.3.1	Reintroduce the dark crimson underwing to two former sites by 2010. (ACTION: EN)
2.2	Replanting woodland with species other than oak, and the fragmentation of large blocks of oak woodland.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
3.1	The surviving colonies are on SSSIs within the New Forest. The New Forest is a candidate SAC.	5.5	Future research and monitoring
4.	Action plan objectives and targets	5.5.1	Undertake surveys to determine the status of the species. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5.2	Conduct targeted autecological research to discover the species' precise requirements, particularly the minimum area of habitat required to maintain populations in the long term. (ACTION: EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.3	Establish a regular monitoring programme for the species on all its known sites, including an assessment of potential sites, to monitor the effectiveness of management agreements. (ACTION: EN)
4.3	Restore populations to two additional sites within the historic range by 2010.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.5	Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.		
5.1	Policy and legislation		

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland oak woodlands, including the light crimson underwing *Catocala promissa*.
 - 5.7.2 This plan should be considered in conjunction with that for the lowland wood pastures and parklands.

Basil thyme case-bearer (*Coleophora tricolor*) Action Plan

1.	Current status	the effects of habitat management designed to meet these needs.
1.1	The basil thyme case-bearer has been recorded in Britain only from unimproved grassland, including road verges, grazed solely by rabbits. The larvae feed on basil thyme <i>Acinos arvensis</i> seedheads in open conditions in early autumn before moving onto grasses on which they overwinter and feed in spring. Adults are on the wing in July and early August. Although there is no direct evidence that this species is in decline, basil thyme has declined in the Brecks and surrounding area. This is thought to be due to a reduction in grazing levels and ground disturbance, particularly that produced by rabbits.	5.1 Policy and legislation 5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF) 5.2 Site safeguard and management 5.2.1 Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2008. (ACTION: EN, FE, MAFF, MoD)
1.2	This species has been recorded only from the Breckland district of Suffolk and Norfolk. Larvae have been recorded at two sites and adults at another. In 1996 the species was recorded in good numbers on a road verge in Suffolk. At one of the sites in Norfolk, owned by the MoD, the moth has not been recorded since the mid 1970s and the habitat there now appears to be unsuitable. Elsewhere in Europe, this species has been recorded at only a single site in Switzerland.	5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN) 5.2.3 Consider notifying as SSSI sites holding key populations of the species, where necessary to secure their long-term protection and appropriate management. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered.	5.3 Species management and protection 5.3.1 Introduce the basil thyme case-bearer to a series of sites within the known range, if necessary to achieve 10 viable populations by 2010. (ACTION: EN)
2.	Current factors causing loss or decline	5.4 Advisory
2.1	Decline in the abundance of the foodplant due to reductions in grazing intensity, particularly as a result of changes in rabbit populations.	5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
2.2	Loss of unimproved Breck grassland.	5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)
3.	Current action	5.5 Future research and monitoring
3.1	A small number of Breckland sites were surveyed for the species by the Norfolk Moth Survey in 1997.	5.5.1 Undertake surveys to determine the status of this species. (ACTION: EN)
4.	Action plan objectives and targets	5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5.3 Establish a regular monitoring programme for the species. (ACTION: EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
4.3	Ensure that 10 viable populations occur within the current range by 2010, using introductions if necessary.	5.6 Communications and publicity
5.	Proposed action with lead agencies	
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat (if necessary with introductions of the species) to combat potential isolation effects. Research should focus on the ecological requirements of the species, and monitoring	

- 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
- 5.7.1 Implementation of this action plan could benefit other species of Breck grassland, including: starry Breck lichen *Squamaria lentigera*, perennial-knawel *Scleranthus perennis* ssp *prostratus*, the four-spotted moth *Tyta luctuosa*, the ground beetle *Harpalus froehlichii*, and the stone-curlew *Burhinus oedipnemus*.
- 5.7.2 This plan should be considered in conjunction with those for lowland dry acid grassland and lowland calcareous grassland.

White-spotted pinion (*Cosmia diffinis*) Action Plan

- | | | | |
|-------|--|-------|--|
| 1. | Current status | 5.2 | Site safeguard and management |
| 1.1 | The white-spotted pinion is a moth whose larvae feed on the foliage of English elm <i>Ulmus procera</i> and wych elm <i>U. glabra</i> , possibly preferring the side-shoots (epicormics) of mature trees growing on damp ground. | 5.2.1 | Ensure that all occupied and nearby potential habitat is appropriately managed by the year 2005, for example through SSSI or agri-environment / woodland grant scheme management agreements. (ACTION: CCW, EN, FC, MAFF, WOAD) |
| 1.2 | This species was widespread and well represented in central and southern England and parts of Wales until the 1970s, since when there has been a massive decline. Huntingdonshire is the only area where it is now reported frequently and in numbers, but occasional records elsewhere indicate that the moth survives at low density in a few other places within its former range. The white-spotted pinion has been recorded from all European countries except Ireland, Norway and Finland, and in many places is local and rare. The range extends at least to Syria in the Middle East. | 5.2.2 | Increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN) |
| | | 5.2.3 | Ensure that the habitat requirements of the species are taken into account in relevant development policies, plans and proposals. There should be a strong presumption against any tree-felling proposals which could adversely affect any significant colonies of the moth. (ACTION: FC, LAs) |
| 2. | Current factors causing loss or decline | 5.3 | Species management and protection |
| 2.1 | The white-spotted pinion has declined due to the death of mature elms as a result of Dutch elm disease. | 5.3.1 | Initiate a programme of captive breeding. (ACTION: CCW, EN) |
| 3. | Current action | 5.3.2 | Identify a series of potential reintroduction sites in different parts of the former range. (ACTION: CCW, EN) |
| 3.1 | Some of the surviving colonies of the white-spotted pinion are on SSSIs. | 5.3.3 | If further colonies are not found, release the species into a series of sites in different parts of the former range, to establish three new viable populations. (ACTION: CCW, EN) |
| 4. | Action plan objectives and targets | 5.4 | Advisory |
| 4.1 | Maintain populations at all known sites. | 5.4.1 | Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, EN) |
| 4.2 | Enhance populations at all known sites by 2010. | 5.5 | Future research and monitoring |
| 4.3 | Restore populations to three suitably managed former localities in England and Wales, using reintroductions if necessary. | 5.5.1 | Undertake surveys to determine the status of this species. (ACTION: CCW, EN) |
| 5. | Proposed action with lead agencies | 5.5.2 | Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN) |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered colonies, and restoring a network of habitat, if necessary with strategic reintroductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation of colonies. | 5.5.3 | Establish a regular monitoring programme for the species. (ACTION: CCW, EN) |
| 5.1 | Policy and legislation | 5.5.4 | Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN) |
| 5.1.1 | Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment or woodland grant schemes. (ACTION: CCW, EN, FC, MAFF, WOAD) | 5.5.5 | Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: CCW, EN, JNCC) |

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of white-spotted pinion and the issue of wildlife affected by Dutch elm disease. This should be achieved through articles within appropriate journals as well as by a publicity leaflet. (ACTION: CCW, EN, FC)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with those for lowland wood pastures and parklands, and upland oak woods.

Striped lychnis (*Cucullia lychnitis*) Action Plan

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| 1. | Current status | |
| 1.1 | Striped lychnis larvae feed on the flowers of dark mullein <i>Verbascum nigrum</i> (which is mostly found on soft limestone) and occasionally other <i>Verbascum</i> and <i>Scrophularia</i> species, preferring sunny open sites. | 5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment and woodland grants schemes. (ACTION: EN, FC, MAFF) |
| 1.2 | This moth was found in scattered sites in 23 ten km squares between 1980 and 1996, in Buckinghamshire, Oxfordshire, Berkshire, north Hampshire and West Sussex. Its range has declined greatly, and within the last 25 years or so it has been lost from half of its range, including all of Wiltshire, Dorset, Surrey, East Anglia and Gloucestershire. In Europe this moth occurs in most countries from the Mediterranean to Denmark and southern Sweden. The range extends to central Asia, the Caucasus, the Urals and Russia. | 5.2 Site safeguard and management
5.2.1 Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2005, including encouraging a wider adoption of appropriate roadside verge cutting regimes. (ACTION: EN, LAs)
5.2.2 Ensure that the habitat requirements of the striped lychnis are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
5.2.3 Increase the available habitat on known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN, FC, LAs) |
| 1.3 | In Great Britain this species is classified as Nationally Scarce. | 5.2.4 Ensure that the striped lychnis is listed in site management documents for all relevant SSSIs. (ACTION: EN) |
| 2. | Current factors causing loss or decline | |
| 2.1 | Inappropriately timed cutting of the larval foodplant on roadside verges and open grassland. | 5.3 Species management and protection |
| 3. | Current action | |
| 3.1 | Some of the colonies are on SSSIs. | 5.3.1 (Re)introduce populations to three former sites, in Dorset, Wiltshire and East Anglia, once apparently unoccupied potential sites have been adequately surveyed. (ACTION: EN) |
| 3.2 | A national survey was undertaken in 1991 for JNCC. | |
| 3.3 | Buckinghamshire County Council has funded surveys, and modified the cutting regimes on particular sections of roadside verge for this species. | 5.4 Advisory
5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN) |
| 4. | Action plan objectives and targets | |
| 4.1 | Maintain populations at all known sites. | 5.5 Future research and monitoring |
| 4.2 | Enhance the population size at all known sites by 2010. | 5.5.1 Undertake further surveys to determine current distribution. (ACTION: EN) |
| 4.3 | Restore viable populations to one site in Wiltshire, one site in Dorset and one in East Anglia by 2010. | 5.5.2 Conduct targeted autecological research to elucidate further the causes of the species' decline and inform habitat management. (ACTION: EN) |
| 5. | Proposed action with lead agencies | |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, combined with reintroductions, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation. | 5.5.3 Establish a regular monitoring programme for this species, including an assessment of potential sites, to monitor the effectiveness of management agreements. (ACTION: EN)
5.5.4 Pass the information gathered during the survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN) |
| 5.1 | Policy and legislation | 5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the |

experience gained towards its conservation in the UK. (ACTION: EN, JNCC)

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat, including the opportunities for biodiversity provided by appropriate management of roadside verges. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Dingy mocha (*Cyclophora pendularia*) Action Plan

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| 1. | Current status | needs, and detection of any changes in the population which may be due to isolation. |
| 1.1 | The larvae of the dingy mocha require 1-3 m tall willow bushes, such as <i>Salix aurita</i> and <i>S. cinerea</i> , in open heathy situations. | 5.1 Policy and legislation |
| 1.2 | The dingy mocha is a very local species, confined to Dorset and western Hampshire where it occurs on the Purbeck heaths between Studland and Wareham, the Ringwood area of the New Forest, and the Luscombe Valley nature reserve near the east Dorset border. Formerly the moth was reported from heathy areas of South Wiltshire, Surrey, Sussex and Suffolk. There are also old records from Devon, Kent and South Wales. This moth has been reported from most countries in Europe, but is very local and rare in Scandinavia. The range extends to north and central Russia, southern Siberia, China, Mongolia, central Asia and Korea. | 5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for land management schemes which are targeted at restoring heathland. (ACTION: EN, MAFF) |
| | | 5.2 Site safeguard and management |
| | | 5.2.1 Where possible, ensure that all existing habitat within the current range of the moth is appropriately managed by 2005. (ACTION: EN, MAFF) |
| | | 5.2.2 Encourage an increase in the available habitat on known sites, and link up existing fragments of habitat. (ACTION: EN) |
| 1.3 | In Great Britain this species is classified as Rare. | 5.2.3 Ensure that the habitat requirements of the dingy mocha are taken into account in relevant development policies, plans and proposals. (ACTION: LAs) |
| 2. | Current factors causing loss or decline | 5.2.4 Ensure that the dingy mocha is listed in site management documents for all relevant SSSIs. (ACTION: EN) |
| 2.1 | Loss of heathland to development, forestry, agricultural improvement and road construction. | 5.3 Species management and protection |
| 2.2 | Succession to woodland (often from self-sown pine) on unmanaged heathland. | 5.3.1 Reintroduce the dingy mocha to a series of restored sites, if necessary, to establish an additional five populations across the former range by 2010. (ACTION: EN) |
| 2.3 | Extensive, unplanned heathland fires. | |
| 2.4 | Scrub clearance during heathland restoration. | |
| 3. | Current action | 5.4 Advisory |
| 3.1 | Most of the remaining populations are within existing SSSIs. | 5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN) |
| 4. | Action plan objectives and targets | 5.5 Future research and monitoring |
| 4.1 | Maintain populations at all known sites. | 5.5.1 Undertake surveys to determine the status of this species by 2004. (ACTION: EN) |
| 4.2 | Enhance the population size at all known sites by 2010. | 5.5.2 Conduct targeted autecological research by 2004 to inform habitat management. (ACTION: EN) |
| 4.3 | Restore viable populations to five additional sites within the historic range by 2010. | 5.5.3 Establish a regular monitoring programme for the species on a representative selection of sites throughout its range. (ACTION: EN) |
| 5. | Proposed action with lead agencies | 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN) |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these | 5.6 Communications and publicity |

- 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
- 5.7.1 This action plan should be considered in conjunction with that for lowland heathland.

Heart moth (*Dicycla oo*) Action Plan

1.	Current status	5.2.2	Increase the available habitat on known sites and in adjacent sites, and attempt to link up existing fragments of habitat, retaining over-mature oak trees wherever possible. (ACTION: EN)
1.1	The heart moth is to be found in parkland and open woodland, where the larvae feed on the foliage of pedunculate oak <i>Quercus robur</i> and seem to prefer over-mature trees.	5.2.3	Ensure that the habitat requirements of this species are taken into account in relevant development policies, plans and proposals. There should be a strong presumption against any tree-felling proposals which could adversely affect significant colonies of the moth. (ACTION: LAs)
1.2	The moth is now seen in numbers only in parts of Surrey, but it also survives at low density in north-west Kent, Berkshire and Northamptonshire. It has been lost from Buckinghamshire, Essex, Middlesex, Hertfordshire and Hampshire in recent decades. The moth has been reported from most countries in Europe but it is extinct, very rare or localised in many parts of its range, which extends to the Middle East and the Urals.	5.2.4	Ensure that the heart moth is listed in site management documents for all relevant SSSIs. (ACTION: EN)
1.3	In Great Britain this species is classified as Rare.	5.3	Species management and protection
2.	Current factors causing loss or decline	5.3.1	None proposed
2.1	Felling of over-mature oak trees.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and importance of beneficial management for its conservation. (ACTION: EN)
3.1	The main population is on Epsom and Ashted Commons SSSI.	5.5	Future research and monitoring
4.	Action plan objectives and targets	5.5.1	Undertake surveys to determine the status of the heart moth. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN, FC)
4.2	Enhance the population size at all known sites by 2010.	5.5.3	Establish a regular monitoring programme for the species. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.6	Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
5.1	Policy and legislation	5.6	Communications and publicity
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment and woodland grants schemes. (ACTION: EN, FC, MAFF)	5.6.1	Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
5.2	Site safeguard and management	5.7	Links with other action plans
5.2.1	Ensure that all occupied and nearby potential habitat is appropriately managed by 2005, for example through SSSI or agri-environment/ woodland grant scheme management agreements. (ACTION: EN, FC, MAFF)	5.7.1	Implementation of this action plan could benefit other species of lowland oak woodlands, including the light crimson underwing <i>Catocala promissa</i> , and the dark crimson underwing <i>Catocala sponsa</i> .

5.7.2 This plan should be considered in conjunction with that for lowland wood pastures and parklands.

Dark-bordered beauty (*Epione parallelaria*) Action Plan

1.	Current status	environment schemes (eg ESAs, Countryside Stewardship, Woodland Grant Scheme, Countryside Premium Scheme). (ACTION: EN, FC, MAFF, SNH, SOAEFD)
1.1	The dark-bordered beauty is associated with damp places. The larva feeds on creeping willow at the English sites, and on low re-growth of aspen on the sites in Scotland.	5.2 Site safeguard and management
1.2	The dark-bordered beauty has been recorded from most countries in Europe, where it is associated with northern or upland habitats. The range extends eastwards through Russia and Siberia to the Amur region. In the UK four small and isolated populations are known: one in north-east Yorkshire, one near Hexham, Northumberland, one near Balmoral (Aberdeenshire) and one in Strathspey (Moray). At one site, in Roxburghshire, its status is unclear as there are no recent records. There are genuine old records from other sites in Northumberland, and many doubtful records from other parts of Britain.	5.2.1 Ensure that all occupied is appropriately managed by 2005. (ACTION: EN, LAs, SNH) 5.2.2 Where possible, increase the available habitat at known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: EN, FC, SNH) 5.2.3 Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: EN, LAs, SNH) 5.2.4 Ensure that dark-bordered beauty is included in site management documents within all relevant SSSIs. (ACTION: EN, SNH)
1.3	In Great Britain this moth is classified as Rare.	5.2.5 Consider notifying as SSSI sites supporting viable populations of the dark-bordered beauty, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN, SNH)
2.	Current factors causing loss or decline	
2.1	Inappropriate habitat management.	
3.	Current action	
3.1	Both English populations are on SSSIs, one of which is an NNR.	5.3 Species management and protection 5.3.1 Consider reintroducing populations of the dark-bordered beauty to former sites, if necessary to maintain 10 viable populations. (ACTION: EN, SNH)
4.	Action plan objectives and targets	
4.1	Maintain populations at all known sites.	5.4 Advisory
4.2	Enhance the population size at all known sites by 2010.	5.4.1 Advise land owners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: EN, SNH)
4.3	Ensure that there are 10 viable populations within the historic range by 2010, by enhancing population sizes at known sites or by re-introducing populations to suitable localities.	5.5 Future research and monitoring 5.5.1 Establish a regular monitoring programme for the species. It will be important to monitor the effects of habitat management for this moth, and to detect any changes in the population which may be due to isolation of colonies. (ACTION: EN, SNH) 5.5.2 Undertake surveys to determine the status of the moth. (ACTION: EN, SNH) 5.5.3 Conduct targeted autecological research to inform habitat management. (ACTION: EN, SNH) 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN, SNH)
5.	Proposed actions with lead agencies	
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying for undiscovered colonies, and restoring a network of habitat to combat potential isolation effects. If necessary, reintroductions of the moth may need to be considered. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation of colonies.	
5.1	Policy and legislation	
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for	

- 5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote understanding and appreciation of the conservation of this moth and its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN, SNH)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of aspen woods, including the hoverfly *Hammerschmidtia ferruginea*.
 - 5.7.2 This plan should be considered in conjunction with that for wet woodlands.

Bordered gothic (*Heliophobus reticulata marginosa*) Action Plan

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| <p>1. Current status</p> <p>1.1 The bordered gothic is associated with open, mainly calcareous, grassland sites but the larval ecology in the wild is unknown. The seedpods of <i>Silene</i> species, such as bladder campion <i>S. vulgaris</i>, and possibly soapwort <i>Saponaria officinalis</i>, as well as knotgrass <i>Polygonum aviculare</i>, are suggested foodplants, based on observations in captivity.</p> <p>1.2 This moth was widely distributed, but always local, in England and Wales from Yorkshire southwards, but its range has declined substantially since the 1960s; it is now reported mainly from the Portland area of Dorset, from the Breckland of East Anglia (where it has become scarce in the last decade) and from South Wales. The species has been recorded throughout Europe. The range extends to Russia, Siberia, Japan and Asia Minor.</p> <p>1.3 In Great Britain this species is classified as Nationally Scarce.</p> | <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that all occupied and nearby potential habitat is appropriately managed, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, WOAD)</p> <p>5.2.2 Where possible, increase available habitat on known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN)</p> <p>5.2.3 Ensure that the habitat requirements of the bordered gothic are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)</p> <p>5.2.4 Ensure that the bordered gothic is listed in site management documents for all relevant SSSIs. (ACTION: CCW, EN)</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Not known.</p> | <p>5.3 Species management and protection</p> <p>5.3.1 Reintroduce the bordered gothic to a series of sites within the historic range, if necessary to restore five additional viable populations. (ACTION: CCW, EN)</p> |
| <p>3. Current action</p> <p>3.1 Some populations are on SSSIs.</p> | <p>5.4 Advisory</p> <p>5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, EN, MAFF, WOAD)</p> |
| <p>4. Action plan objectives and targets</p> <p>4.1 Maintain populations at all known sites.</p> <p>4.2 Enhance the population size at all known sites by 2010.</p> <p>4.3 Restore viable populations to five additional sites within the historic range by 2010.</p> | <p>5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, EN, MAFF, WOAD)</p> |
| <p>5. Proposed action with lead agencies</p> <p>The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.</p> | <p>5.5 Future research and monitoring</p> <p>5.5.1 Undertake surveys to determine current distribution. (ACTION: CCW, EN)</p> <p>5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN)</p> <p>5.5.3 Establish a regular monitoring programme. (ACTION: CCW, EN)</p> <p>5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN)</p> |
| <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: CCW, EN, MAFF, WOAD)</p> | <p>5.6 Communications and publicity</p> <p>5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within</p> |

appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Narrow-bordered bee hawk-moth (*Hemaris tityus*) Action Plan

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| 1. | Current status | the effects of habitat management designed to meet these needs. |
| 1.1 | The narrow-bordered bee hawk-moth occurs on a wide range of unimproved grasslands, including wet, acidic grassland and chalk downland; it is also found on acid bogs, peat cuttings and drier heathland. The larval foodplant is devil's-bit scabious. The adult moth requires a supply of nectar but visits various flower species. | 5.1 Policy and legislation |
| 1.2 | Formerly widespread in the UK, the narrow-bordered bee hawk-moth has declined severely and now appears to have retreated to western Britain, especially south-west England from Cornwall to Wiltshire. There are also scattered records from west Wales, the west coast of Scotland, Northern Ireland, and a single colony on a nature reserve in Yorkshire. The moth occurs locally across the western Palaearctic, with records from virtually every country in Europe. It reaches Lapland in the north, Iran to the south, extends eastwards into China, and has been reported from Morocco. | 5.1.1 Where appropriate, include the requirements of the narrow-bordered bee hawk-moth when drawing up or revising prescriptions for agri-environment schemes. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD) |
| 1.3 | In Great Britain this species is classified as Nationally Scarce. | 5.2 Site safeguard and management |
| 2. | Current factors causing loss or decline | 5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2005, for example through SSSI/ASSI or agri-environment scheme management agreements. (ACTION: CCW, DANI, EHS, EN, MAFF, MoD, SNH, SOAEFD, WOAD) |
| 2.1 | Agricultural improvement of unimproved grassland and heathland. | 5.2.2 Encourage an increase in the available habitat and attempt to link up existing fragments of habitat. (ACTION: CCW, DANI, EHS, EN, MAFF, MoD, SNH, SOAEFD, WOAD) |
| 2.2 | Inappropriate management of grassland, heathland and bogs. | 5.2.3 Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: CCW, EHS, EN, LAs, SNH) |
| 3. | Current action | 5.2.4 Ensure that the narrow-bordered bee hawk-moth is included in site management documents for all relevant SSSIs/ASSIs. (ACTION: CCW, EHS, EN, SNH) |
| 3.1 | Some of the remaining localities are within existing SSSIs/ASSIs, nature reserves or MoD land, and many are now covered by agri-environment schemes. | 5.3 Species management and protection |
| 3.2 | Several grassland areas supporting populations of the narrow-bordered bee hawk-moth have been proposed as candidate SACs. | 5.3.1 Consider reintroducing populations to a series of sites within the former range, if necessary to restore 10 new populations within the former range by 2010. (ACTION: CCW, EHS, EN, SNH) |
| 4. | Action plan objectives and targets | 5.4 Advisory |
| 4.1 | Maintain populations at all known sites. | 5.4.1 Advise landowners and managers about the presence of this species and the importance of beneficial management for its conservation. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD) |
| 4.2 | Restore populations of the moth to 10 suitable sites within its former range by 2010. | 5.4.2 As far as possible, ensure that all relevant agri-environment project officers and members of regional agri-environment consultation groups are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD) |
| 5. | Proposed action with lead agencies | 5.5 Future research and monitoring |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, undertaking surveys to locate undiscovered colonies, and restoring a network of habitat. Reintroductions of the species to sites within its former range may be necessary. Research will focus on the ecological requirements of the species, and monitoring | 5.5.1 Undertake surveys to determine the current distribution and status of the narrow-bordered bee hawk-moth. (ACTION: CCW, EHS, EN, SNH) |

- 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EHS, EN, SNH)
- 5.5.3 Establish a regular monitoring programme for this species. It will be important to monitor the effects of habitat management for this moth. (ACTION: CCW, EHS, EN, MoD, SNH)
- 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for inclusion in national and international databases. (ACTION: CCW, EHS, EN, SNH)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the narrow-bordered bee hawk-moth and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EHS, EN, SNH)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of unimproved wet grasslands, including the double-line moth *Mythimna turca*, and the marsh fritillary *Eurodryas aurinia*.
 - 5.7.2 This plan should be considered in conjunction with those for purple moor-grass and rush pastures, lowland heathland, and fens.

Buttoned snout (*Hypena rostralis*) Action Plan

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| 1. | Current status | 5.2.1 | Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2005, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, WOAD) |
| 1.1 | Buttoned snout larvae feed on hop <i>Humulus lupulus</i> , particularly plants sprawling across the ground. The adults hibernate in man-made shelters, outbuildings, etc and in caves. | 5.2.2 | Where possible, increase available habitat on known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN) |
| 1.2 | This moth was formerly widespread throughout southern Britain north to Lincolnshire and South Wales. It has declined significantly and now occurs mainly in river valleys in south-east England, particularly the Thames basin, and on estuaries and others scattered sites around the coast of England. The species has been reported from every country in Europe except Ireland. The range extends to the Lebanon, southern Russia and Iran. | 5.2.3 | Ensure that the habitat requirements of the buttoned snout are taken into account in relevant development policies, plans and proposals, including the redevelopment of derelict urban sites. (ACTION: LAs) |
| 1.3 | In Great Britain this species is classified as Nationally Scarce. | 5.2.4 | Ensure that the buttoned snout is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN) |
| 2. | Current factors causing loss or decline | 5.3 | Species management and protection |
| 2.1 | Redevelopment of derelict urban sites. | 5.3.1 | Reintroduce the buttoned snout to a series of sites, if necessary to restore an additional five self-sustaining populations by 2010. (ACTION: CCW, EN) |
| 3. | Current action | 5.4 | Advisory |
| 3.1 | Some populations are on SSSIs. | 5.4.1 | Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, EN, MAFF, WOAD) |
| 4. | Action plan objectives and targets | 5.4.2 | As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, EN, MAFF, WOAD) |
| 4.1 | Maintain populations at all known sites. | 5.5 | Future research and monitoring |
| 4.2 | Enhance the population size at all known sites by 2010. | 5.5.1 | Undertake surveys to determine the current status of this species. (ACTION: CCW, EN) |
| 4.3 | Restore self-sustaining populations to five additional sites within the historic range by 2010. | 5.5.2 | Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN) |
| 5. | Proposed action with lead agencies | 5.5.3 | Establish a regular monitoring programme for the species. (ACTION: CCW, EN) |
| | The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation. | 5.5.4 | Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN) |
| 5.1 | Policy and legislation | 5.5.5 | Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: CCW, EN, JNCC) |
| 5.1.1 | Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: CCW, EN, MAFF, WOAD) | | |
| 5.2 | Site safeguard and management | | |

- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the buttoned snout and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN)
- 5.7 Links with other action plans
 - 5.7.1 None proposed.

Silky wave (*Idaea dilutaria*) Action Plan

1.	Current status	5.1	Policy and legislation
1.1	All of the known sites for the silky wave are steep, south-facing areas of open calcareous grassland, and populations are confined to areas where grazing is light or absent. The recorded larval foodplant is common rock-rose, but the withered leaves of various other herbs and shrubs are reported as foodplants elsewhere in Europe.	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: CCW, EN, MAFF, WOAD)
1.2	Three populations are known in the UK, one on the Great Orme in North Wales, another near Bristol, and a third on the Gower coast of Glamorgan. Formerly the moth was reported much more widely in England and Wales. Some of the old records are misidentifications or are the result of confusing changes of nomenclature in the past, so the real decline may be less than it appears. However, it is possible that there are still some overlooked populations. The silky wave is well-distributed in central and southern Europe; it extends eastwards into the Balkans and Asia Minor, occurring in a wide range of habitats north to southern Sweden where it is very restricted and confined to south-facing slopes.	5.2	Site safeguard and management
		5.2.1	Ensure that all occupied habitat is appropriately managed by 2004, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, WOAD)
		5.2.2	Where possible, increase the area of suitable habitat on known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN, LAs, MAFF, WOAD)
		5.2.3	Ensure that the silky wave is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN)
1.3	In Great Britain this species is classified as Rare.	5.3	Species management and protection
		5.3.1	Consider reintroducing populations to three former sites by 2010. (ACTION: CCW, EN)
2.	Current factors causing loss or decline	5.4	Advisory
2.1	Inappropriate grassland management.	5.4.1	Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: CCW, EN)
3.	Current action	5.5	Future research and monitoring
3.1	All of the known sites are SSSIs and two are candidate SACs.	5.5.1	Undertake further surveys to determine the status of this species. (ACTION: CCW, EN)
3.2	Butterfly Conservation, CCW and EN jointly funded a survey of the known sites in 1994.	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN)
4.	Action plan objectives and targets	5.5.3	Establish a regular monitoring programme for the species. (ACTION: CCW, EN)
4.1	Maintain populations at all known sites.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: CCW, EN)
4.2	Enhance populations size at all known sites by 2005.	5.5.5	Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: CCW, EN, JNCC)
4.3	If no further colonies are discovered, reintroduce populations to three former sites by 2010.	5.6	Communications and publicity
5.	Proposed action with lead agencies	5.6.1	Promote opportunities for the appreciation of the silky wave and the conservation issues associated with its
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, and undertaking surveys for undiscovered colonies. Reintroductions of populations to former sites will need to be considered if no further colonies are discovered. Research should focus on the ecological requirements of the species, whilst monitoring the effects of habitat management designed to meet these needs.		

habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN)

- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of calcareous grasslands, including the silver-studded blue *Plebejus argus*.
 - 5.7.2 This plan should be considered in conjunction with those for lowland calcareous grassland, and maritime cliffs and slopes.

Orange upperwing (*Jodia croceago*) Action Plan

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| 1. | Current status | highlight the importance of a diverse woodland structure. |
| 1.1 | The orange upperwing is an open woodland or woodland-edge species. The larval foodplants are pedunculate oak and sessile oak (<i>Quercus robur</i> and <i>Q. petraea</i>), both of which are abundant throughout Britain. The moth is particularly associated with smaller coppice trees that retain their leaves over winter, as the adult moths overwinter within withered oak leaves which have remained on the tree. | 5.1 Policy and legislation |
| | | 5.1.1 Where appropriate, include the requirements of the orange upperwing when preparing or revising prescriptions for agri-environment and woodland grant schemes, focussing on the retention of small oak trees within woodlands. (ACTION: CCW, EN, FC, MAFF, WOAD) |
| 1.2 | The orange upperwing has been recorded from central, southern and south-western England, with occasional records from Wales, but by about 1980 it was apparently restricted to Cornwall, Devon, Sussex, Surrey, Shropshire and South Wales. The last definite record was from Sussex in 1984, although there is a recent unconfirmed record from Hampshire. It seems to have disappeared from its main locality in Surrey. There are no populations currently known. The orange upperwing is widely distributed but scarce in Europe and North Africa. | 5.2 Site safeguard and management |
| | | 5.2.1 Ensure that all sites where re-establishment is proposed are appropriately managed, for example through uptake of woodland grants. (ACTION: CCW, EN, FC) |
| | | 5.3 Species management and protection |
| | | 5.3.1 Initiate a programme of captive breeding to provide material for experimental study and reintroductions. (ACTION: CCW, EN) |
| 1.3 | In Great Britain this species is classified as Endangered. | 5.3.2 Following assessment of the current status of the orange upperwing, undertake reintroductions into suitably restored habitats in a range of former sites across southern and south-western England and in Wales. (ACTION: CCW, EN) |
| 2. | Current factors causing loss or decline | |
| 2.1 | Decline of woodland coppice management. | |
| 2.2 | Inappropriate ride and woodland management. | 5.4 Advisory |
| | | 5.4.1 Advise landowners and managers of the presence of the orange upperwing and the importance of beneficial management, aimed at a diverse woodland structure, for its conservation. (ACTION: CCW, EN) |
| 3. | Current action | |
| 3.1 | Current searches for the moth centre on former sites, including Yarner Woods NNR and Friday Street in Surrey. | 5.5 Future research and monitoring |
| 4. | Action plan objectives and targets | |
| 4.1 | If refound in Britain, enhance the population size at known sites by 2010. | 5.5.1 Undertake surveys to determine the status of the species. (ACTION: CCW, EN) |
| 4.2 | Establish an ex situ programme to provide material for reintroductions and ecological research. | 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN, FC) |
| 4.3 | Restore to 1980 status in Wales and southern and south-western England, by reintroductions if necessary. | 5.5.3 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: CCW, EN) |
| 5. | Proposed action with lead agencies | 5.6 Communications and publicity |
| | The first priority is to determine whether the orange upperwing is still present in Britain. Suitable land management on former and potential sites will be important, in conjunction with a captive breeding programme and reintroductions to a range of former sites. Liaison with landowners and managers should | 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN) |
| | | 5.7 Links with other action plans |

- 5.7.1 Implementation of this action plan could benefit other species of lowland oakwoods, including the light crimson underwing *Catocala promissa*, and the dark crimson underwing *Catocala spona*.
- 5.7.2 This plan should be considered in conjunction with those for lowland wood pastures and parklands, and upland oak woods.

Adonis blue (*Lysandra bellargus*) Action Plan

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| <p>1. Current status</p> <p>1.1 The Adonis blue breeds in unimproved calcareous grassland, especially steep, south-facing chalk downland, where its larval food plant, horseshoe vetch <i>Hippocrepis comosa</i>, grows in a short, heavily grazed turf. It has two generations a year, with adults flying in May/early June and again, usually in larger numbers, in August and September.</p> <p>1.2 The Adonis blue is a highly restricted species which occurs chiefly in Dorset, Wiltshire and the Isle of Wight, with a few colonies in Sussex, Surrey, Buckinghamshire and Kent. The species underwent a rapid decline in range, estimated at 90%, in the 1950s following a decline in stock grazing on unimproved pasture and the loss of rabbits due to myxomatosis. The species became extinct in the 19th century in Cambridge, Essex, and Suffolk, while recent extinctions have occurred in Buckinghamshire (1980s), Bedfordshire (c1960), Hertfordshire (c1960), Hampshire (apart from one site on Dorset/Hampshire border, 1990s), Gloucestershire (1963) and Somerset (1963). Since the late 1970s there has been a partial recovery due to an increase in grazing, associated primarily with the recovery in rabbit numbers and increases in stock grazing, often for conservation. However, the Adonis blue is a highly sedentary species, and its recovery is hindered by the fragmentation and isolation of its calcareous grassland habitat. Recent records suggest that there are approximately 250 populations in 272 tetrads. The Adonis blue is widespread but declining in Europe and occurs across central Europe from Spain to the Ukraine.</p> <p>1.3 In Great Britain this species is classified as Nationally Scarce. It is given protection under Schedule 5 of the Wildlife and Countryside Act 1981, with respect to sale only.</p> | <p>3.3 There have been recent surveys to assess the butterfly's status in some parts of its range.</p> <p>4. Action plan objectives and targets</p> <p>4.1 Maintain existing populations, concentrating on a network of sites that contain at least some large populations.</p> <p>4.2 Restore populations to the 1970-82 distribution by 2010, using reintroductions if necessary.</p> <p>5. Proposed action with lead agencies</p> <p>The objectives of the plan will be achieved by: encouraging beneficial land management on existing sites, especially those that occur on nature reserves; surveying sites for the Adonis blue and reviewing its status in the UK; and restoring and maintaining networks of suitable habitats. Research will support these actions, particularly conservation management, the role of ants in the life cycle, metapopulation structure, and the ecology of the species.</p> <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the Adonis blue when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)</p> <p>5.2 Site safeguard and management</p> <p>5.2.1 Ensure that the habitat requirements of the Adonis blue are taken into account in relevant development policies, plans and proposals affecting any site supporting large populations of the species. (ACTION: EN, LAs)</p> <p>5.2.2 Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF)</p> <p>5.2.3 Where possible, increase the available habitat at known sites and in adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: EN, MAFF)</p> <p>5.2.4 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN)</p> <p>5.2.5 Consider notifying as SSSI sites holding key populations of the species where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)</p> <p>5.3 Species management and protection</p> <p>5.3.1 Consider reintroductions into suitably restored habitat, if beyond the limits of natural spread. (ACTION: EN)</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Inappropriate grazing intensity due to changes in stocking rates and fluctuations in rabbit populations.</p> <p>2.2 Loss of unimproved calcareous grasslands and fragmentation of remaining habitat.</p> | |
| <p>3. Current action</p> <p>3.1 A species action plan, grant-aided by CCW, EN, SNH and WWF, was published by Butterfly Conservation in 1997.</p> <p>3.2 Conservation management is being implemented on several nature reserves and SSSIs, and under agri-environment schemes within the South Downs and South Wessex Downs ESAs and through Countryside Stewardship Scheme agreements.</p> | |

- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
 - 5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)
- 5.5 Future research and monitoring
 - 5.5.1 Undertake further surveys to determine the status of the species. (ACTION: EN)
 - 5.5.2 Collate population monitoring data and management data from all monitored sites annually, and calculate an annual index to compare trends on individual sites. Review and extend the network if necessary. (ACTION: EN, JNCC)
 - 5.5.3 Conduct targeted autecology research, including the possible impact of RVHD (rabbit viral haemorrhagic disease) and other new rabbit viruses, the relationship with ants and the structure of metapopulations, in order to inform habitat management. (ACTION: EN, DETR)
 - 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this butterfly and its habitat, and the measures being taken to conserve them, possibly through the production of a booklet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Double line (*Mythimna turca*) Action Plan

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| 1. | Current status | populations, and by undertaking reintroductions to woodland sites within the former range. Research should focus on the ecological requirements of the species, whilst monitoring the effects of habitat management designed to meet these needs. |
| 1.1 | The double line occurs in wet grasslands, and woodland clearings and rides. In the south west of England, the moth is able to survive in exposed situations such as open moorland and coastal grassland. Little is known about its ecology, although the larvae feed at night on grasses such as common bent-grass, creeping soft-grass and cock's-foot. | 5.1 Policy and legislation |
| 1.2 | In Europe, this moth is widely distributed but local from Spain to Sweden, and is also found through Asia to Japan. In the UK, the double line is now virtually confined to western Wales and south-west England (Somerset, Devon and Cornwall), where it is chiefly associated with wet grassland. It has been recorded from south-east England in open woodland, but has now apparently largely disappeared from this habitat, perhaps due to changes in woodland management such as the shading out of woodland rides. Previously recorded from the New Forest, Savernake Forest, Epping Forest and sites in Cheshire, Buckinghamshire, Hertfordshire and West Sussex, it appears to have disappeared from all of these areas. It is still known from Richmond Park with occasional records from Wimbledon Common and Berkshire. | 5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes (eg ESAs, Woodland Grant Schemes). (ACTION: CCW, EN, FC, MAFF, WOAD) |
| 1.3 | In Great Britain this species is classified as Nationally Scarce. | 5.2 Site safeguard and management |
| 2. | Current factors causing loss or decline | 5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, FC, LAs, MAFF, WOAD) |
| 2.1 | Changes in woodland management resulting in the shading out of woodland rides and glades. | 5.2.2 Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: CCW, EN, LAs) |
| 2.2 | Agricultural improvement of wet grassland. | 5.2.3 Ensure that the double line moth is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN) |
| 2.3 | Over-grazing. | 5.3 Species management and protection |
| 3. | Current action | 5.3.1 Restore populations to five former woodland sites by 2010. (ACTION: EN, FC) |
| 3.1 | This species is present on at least three NNRs, whilst many other populations occur on SSSIs and other nature reserves. Cors Caron and part of the Culm Measures in Devon are candidate SACs. | 5.4 Advisory |
| 4. | Action plan objectives and targets | 5.4.1 Advise landowners and managers of the presence of the double line and the importance of beneficial management for its conservation. (ACTION: CCW, EN, MAFF, WOAD) |
| 4.1 | Maintain populations at all known sites. | 5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, EN, MAFF, WOAD) |
| 4.2 | Restore populations to five former woodland sites by 2010. | 5.5 Future research and monitoring |
| 5. | Proposed action with lead agencies | 5.5.1 Undertake surveys to determine the current status of the double line moth. (ACTION: EN) |
| | The objectives of this plan will be achieved by securing sympathetic management of sites known to support | 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN). |
| | | 5.5.3 Establish a regular monitoring programme for this species on key sites. (ACTION: CCW, EN) |

- 5.5.4 Pass information gathered during the survey and monitoring of this species to a central database so that it can be incorporated into national and international databases. (ACTION: CCW, EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitats. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: CCW, EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of wet grasslands, including the marsh fritillary *Eurodryas aurinia*, and the narrow-bordered bee hawk-moth *Hemaris tityus*.
 - 5.7.2 This plan should be considered in conjunction with those for purple moor-grass and rush pastures, and coastal and floodplain grazing marsh.

Brighton wainscot (*Oria musculosa*) Action Plan

1.	Current status	5.2.1	Encourage an increase in suitable habitat by appropriate management of cereal crops and field margins. (ACTION: EN, MAFF)
1.1	The Brighton wainscot is now primarily associated with cereal field margins. Its eggs, which overwinter, are laid on or near various grasses and cereals. The larvae feed between April and June on winter wheat, summer rye, oats or barley.	5.2.2	Where relevant, require that by 2005 management plans, which are agreed for agri-environment scheme funding, take account of the moth's requirements. (ACTION: EN, MAFF)
1.2	In the UK, the Brighton wainscot has always been confined to central-southern England, with the most recent records being from south Wiltshire and north Hampshire. Since 1980 it has been reported from less than 25% of the ten kmsquares with previous records. The species occurs throughout central and southern Europe eastwards to Iran. It is considered to be an agricultural pest in some southern parts of its range.	5.3	Species management and protection
1.3	In Great Britain this species is classified as Nationally Scarce.	5.3.1	None proposed.
2.	Current factors causing loss or decline	5.4	Advisory
2.1	Changes in farming practice, including choice of crops and time of sowing.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
2.2	Use of insecticides.	5.4.2	As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)
3.	Current action	5.5	Future research and monitoring
3.1	None known.	5.5.1	Undertake surveys to determine the status of the species. (ACTION: EN)
4.	Action plan objectives and targets	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5.3	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
4.2	Maintain 20 viable populations within the known range.	5.5.4	Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
5.	Proposed action with lead agencies	5.6	Communications and publicity
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying available habitat for undiscovered populations, and restoring a network of habitat to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.6.1	Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN, MAFF)
5.1	Policy and legislation	5.7	Links with other action plans
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)	5.7.1	This action plan should be considered in conjunction with that for cereal field margins.
5.2	Site safeguard and management		

Barberry carpet (*Pareulype berberata*) Action Plan

1.	Current status	5.1	Policy and legislation
1.1	The barberry carpet is named after the foodplant of its larvae, barberry <i>Berberis vulgaris</i> , which occurs in hedgerows and woodland edges in sunny situations.	5.1.1	Where appropriate, encourage the planting of native barberry through agri-environment, hedgerow and woodland grant schemes. (ACTION: EN, FC, MAFF)
1.2	In the UK five colonies are known to remain in the wild: one in each of Suffolk, Gloucestershire, Wiltshire, Hampshire and Dorset. Formerly the moth occurred in other counties from Devon and Sussex north to Yorkshire. The species has been recorded from most European countries eastwards to Asia Minor and the Caucasus and reaches its northernmost limit in south-east Sweden.	5.2	Site safeguard and management
		5.2.1	Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. Emphasis should be given to the appropriate management of hedgerows. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.	5.2.2	Ensure that the habitat requirements of the barberry carpet are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
		5.2.3	Ensure that the barberry carpet is included in site management documents for all relevant SSSIs. (ACTION: EN)
2.	Current factors causing loss or decline	5.2.4	Consider sites supporting the barberry carpet for notification as SSSIs where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
2.1	Widespread eradication of the foodplant since the 19th century because it is a host of the wheat-rust fungus <i>Puccinia graminis</i> (to which most strains of wheat are now resistant).	5.3	Species management and protection
2.2	Damage to the foodplant by burning, mechanised hedge trimming and hedgerow removal.	5.3.1	Initiate a programme of captive breeding to provide material for experimental study and establishment trials. (ACTION: EN)
3.	Current action	5.3.2	Reintroduce the barberry carpet to a series of former sites, if necessary to establish an additional 10 self-sustaining populations. (ACTION: EN)
3.1	The species has been the subject of an EN Species Recovery Programme since 1995.	5.3.3	Enforce current legislation in cases of collecting. (ACTION: EN, Police authorities)
3.2	One site has been notified as an SSSI.	5.4	Advisory
4.	Action plan objectives and targets	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)
4.1	Maintain populations at all known sites.	5.4.2	As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)
4.2	Enhance the population size at all known sites by 2010.	5.5	Future research and monitoring
4.2	Restore the species to an additional series of 10 viable populations within its former range by 2010.	5.5.1	Undertake surveys to determine the status of the species. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.		

- 5.5.3 Establish a regular monitoring programme for the species, including an assessment of occupied and potential sites, to monitor the effectiveness of management agreements. (ACTION: EN)
- 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with those for cereal field margins, and ancient and species-rich hedgerows.

Common fan-foot (*Pechipogo strigilata*) Action Plan

1.	Current status	5.2	Site safeguard and management
1.1	The common fan-foot is a moth of broadleaved woodland where the larvae begin development on fresh or wilting foliage of oak, <i>Quercus</i> spp, and probably other trees and shrubs. They later prefer withered and decaying leaves on the tree or on the ground.	5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2005, for example through SSSI or woodland grant scheme management agreements. (ACTION: EN, FC, MAFF)
1.2	The moth formerly occurred throughout most of southern England and Wales, but it has declined greatly in recent decades and now survives in only a small number of oak woods on heavy clay soils in the Midlands and south-central England. The species has been reported from almost every country in Europe except Albania, Greece, Crete and Turkey, but its current status is unclear. The range extends eastwards through Russia to Japan.	5.2.2	Increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN, FC)
1.3	In Great Britain this species is classified as Nationally Scarce.	5.2.3	Ensure that the habitat requirements of the common fan-foot are taken into account in relevant development policies, plans and proposals, and forest (re)planting proposals. (ACTION: FC, LAs)
2.	Current factors causing loss or decline	5.2.4	Ensure that the common fan-foot is included in site management documents for all relevant SSSIs. (ACTION: EN)
2.1	Not known.	5.3	Species management and protection
3.	Current action	5.3.1	Reintroduce the common fan-foot to a series of former sites, if necessary to establish five new viable populations. (ACTION: EN)
3.1	Some of the surviving populations are on SSSIs.	5.4	Advisory
4.	Action plan objectives and targets	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.1	Maintain populations at all known sites.	5.5	Future research and monitoring
4.2	Enhance the population size at all known sites by 2010.	5.5.1	Undertake surveys by 2004 to determine the status of the species. (ACTION: EN)
4.3	Restore viable populations to five additional sites within the historic range by 2010.	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.3	Establish a regular monitoring programme for the species in all core areas, including an assessment of potential sites, to monitor the effectiveness of management agreements. (ACTION: EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with strategic introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.4	Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
5.1	Policy and legislation	5.6	Communications and publicity
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment (farm woodland) or woodland management schemes. (ACTION: EN, FC, MAFF)	5.6.1	Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
		5.7	Links with other action plans

- 5.7.1 Implementation of this action plan could benefit other species of lowland coppiced woodland, including the drab looper *Minoa murinata*; and of mature oak woodland, including the light crimson underwing *Catocala promissa*, and the dark crimson underwing *Catocala sponsa*.
- 5.7.2 This plan should be considered in conjunction with that for lowland wood pastures and parklands.

Silver-studded blue (*Plebejus argus*) Action Plan

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|--|---|
| <p>1. Current status</p> <p>1.1 The silver-studded blue occurs on lowland heathland, calcareous grassland and at a single peatland site in Wales. In all habitats, the species requires the presence of ant species of the genus <i>Lasius</i>, open ground for breeding, and either bare soil or short vegetation. The preferred conditions produce warm microclimates at ground level for the larvae, a factor that is especially important towards the north of the species' range. Early successional stages are preferred, particularly where succession is held in check by grazing. Most heathland colonies exist on sites that have been either recently disturbed, such as sand pits, quarries and firebreaks, or burnt. Conditions usually become suitable after 2-5 years of re-growth. In the absence of traditional management (such as the cutting of heather and invasive scrub, grazing of domestic animals, or burning to encourage young growth for livestock), suitable conditions on heathlands are short-lived, perhaps lasting 5-10 years. In most situations, the silver-studded blue appears to exist in metapopulations, with patches of suitable habitat linked by the occasional dispersal of adults.</p> <p>1.2 The silver-studded blue has undergone a severe decline in range this century, estimated at 80%. It has become extinct in Scotland and northern England, and throughout most of central, eastern and south-eastern England. It remains widespread only on the heaths of Dorset and Hampshire, although strong populations also occur in North Wales. It occurs throughout Europe except Scandinavia, occurring in a wide range of habitat, including alpine grassland, meadows, forest clearings and xerophytic scrubland, but it is declining in the west of Europe (eg Belgium, the Netherlands and Denmark).</p> <p>1.3 In Great Britain the silver-studded blue is classified as Nationally Scarce. It is protected under Schedule 5 of the Wildlife and Countryside Act 1981, with respect to sale only.</p> | <p>3.2 The silver-studded blue is well represented on nature reserves, SSSIs and other protected areas. Several populations are present on candidate SACs.</p> <p>3.3 In 1995 EN published a booklet on the conservation of the silver-studded blue in lowland heathlands.</p> <p>3.4 A number of introductions and reintroductions of the silver-studded blue have been attempted by conservationists including well-documented introductions in North Wales and Suffolk.</p> <p>3.5 Three silver-studded blue populations are covered by transects operated under the Butterfly Monitoring Scheme and many more are covered by independent transects undertaken by site managers or volunteers.</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Loss of heathland to development and agriculture</p> <p>2.2 Fragmentation and isolation of habitat.</p> <p>2.3 Inappropriate heathland and grassland management .</p> <p>2.4 Increased quarrying activities, particularly on the Isle of Portland, Dorset.</p> | |
| <p>3. Current action</p> <p>3.1 A species action plan, grant-aided by CCW, EN, SNH and WWF, was published by Butterfly Conservation in 1996.</p> | |
| <p>4. Action plan objectives and targets</p> <p>4.1 Maintain populations at all known sites.</p> <p>4.2 Restore populations to former sites occupied post-1970 by 2010, using reintroductions if necessary.</p> | |
| <p>5. Proposed action with lead agencies</p> <p>The objectives of this plan will be achieved by: encouraging beneficial land management on existing sites; restoring and maintaining a network of habitat between existing sites and within its former range; and conducting re-introductions. Further research and survey will be supported, particularly into the status and ecology of the species in relatively poorly-described parts of its range.</p> <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the silver-studded blue when preparing or revising prescriptions for agri-environment schemes. (ACTION: CCW, EN, FC, MAFF, WOAD)</p> <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, FC, MAFF, WOAD)</p> <p>5.2.2 Where possible, ensure that existing populations do not become fragmented by management practices or development. (ACTION: CCW, EN, FC, LAs, MAFF, WOAD)</p> <p>5.2.3 Where possible, increase the available habitat at known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN, FC, MAFF, WOAD)</p> | |

- 5.2.4 Restore suitable habitats in the English part of former range, initially concentrating on areas close to existing populations (south-east, south-west, eastern and midland England). (ACTION: EN)
- 5.2.5 Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: CCW, EN, LAs)
- 5.2.6 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN)
- 5.3 Species management and protection
 - 5.3.1 Consider reintroducing the silver-studded blue to a series of sites within its former range. (ACTION: CCW, EN)
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the silver-studded blue and the importance of beneficial management for its conservation. (ACTION: CCW, EN, MAFF, WOAD)
 - 5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, EN, MAFF, WOAD)
- 5.5 Future research and monitoring
 - 5.5.1 Undertake surveys to determine the current status of the silver-studded blue. (ACTION: CCW, EN)
 - 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EN)
 - 5.5.3 Collate transect and management data from all monitored sites (in addition to Butterfly Monitoring Scheme sites) annually, and calculate an annual index to compare trends on individual sites. Review and extend series of monitored sites if necessary. (ACTION: CCW, EN)
 - 5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the silver-studded blue and the conservation issues associated with lowland heathland and lowland calcareous grassland. (ACTION: CCW, EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland heathland and grasslands, including the silky wave moth *Idaea dilutaria*.
 - 5.7.2 This plan should be considered in conjunction with those for lowland calcareous grassland, and lowland heathland.

Pale shining brown (*Polia bombycina*) Action Plan

1.	Current status	SSSI or agri-environment scheme management agreements. (ACTION: CCW, EN, MAFF, WOAD)
1.1	The main habitat of the pale shining brown is scrubby grassland on light calcareous soils. The larval foodplant in the wild is unknown, but it has been reared in captivity on various herbaceous plants and may eat buds of low woody growth in the spring.	5.2.2 Increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: CCW, EN, MAFF, WOAD)
1.2	In the UK it formerly occurred widely in England, mainly south of a line between the Severn and the Humber, but it has declined substantially with records from about 20 scattered sites since 1980, only a few of which have strong colonies. It was formerly, and may still be, present on the coast of North Wales. This moth has been recorded from almost every country in Europe.	5.2.3 Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: EN, LAs) 5.2.4 Ensure that the pale shining brown is included in site management documents for all relevant SSSIs. (ACTION: CCW, EN)
1.3	In Great Britain this species is classified as Local.	5.3 Species management and protection 5.3.1 None proposed.
2.	Current factors causing loss or decline	5.4 Advisory
2.1	Not known.	5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: CCW, EN)
3.	Current action	5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, EN, MAFF, WOAD)
3.1	A number of the current and former sites are SSSIs.	5.5 Future research and monitoring
4.	Action plan objectives and targets	5.5.1 Undertake surveys to determine current distribution. (ACTION: CCW, EN)
4.1	Maintain populations at all known sites.	5.5.2 Conduct targeted autecological research to elucidate the causes of decline and inform habitat management. (ACTION: CCW, EN)
4.2	Enhance the population size at all known sites by 2010.	5.5.3 Establish a regular monitoring programme for this species. (ACTION: CCW, EN)
5.	Proposed action with lead agencies	5.5.4 Pass the information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: CCW, EN)
	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, undertaking surveys for undiscovered colonies, and restoring a network of populations to combat the potential effects of habitat fragmentation. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation of colonies.	5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: CCW, EN, JNCC)
5.1	Policy and legislation	5.6 Communications and publicity
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment and woodland grants schemes. (ACTION: CCW, EN, FC, MAFF, WOAD)	5.6.1 Promote understanding and appreciation of this moth and the conservation issues associated with its habitat. This should be achieved through articles within
5.2	Site safeguard and management	
5.2.1	Where possible, ensure that all occupied habitat is appropriately managed by 2005, for example, through	

appropriate journals, as well as by a publicity leaflet.
(ACTION: CCW, EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Netted mountain moth (*Semiothisa carbonaria*) Action Plan

1.	Current status	5.1	Policy and legislation
1.1	The netted mountain moth inhabits open moorland and mountainsides. The larva feeds by night on the foliage of bearberry, resting by day on the underside of a leaf. The larval period coincides with the time when young shoots are available, and the adults fly between April and early June when these shoots are forming. Larvae have been reared in captivity on birch, willow, and bilberry, but there is no evidence that these are used in the wild. They overwinter as pupae.	5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes and grants, especially woodland grant schemes for areas on or near to colonies. (ACTION: FC, SNH, SOAEFD)
1.2	This is a moth of northern Europe; it is quite common in northern parts of Norway, Sweden and Finland. It also occurs in the mountains of central Europe, south to the Alps and eastwards through Russia to north-east Siberia. It is not recorded from Ireland. In the UK it has a scattered distribution in the central Scottish Highlands, where it is known from fewer than 15 ten km squares, though it may be under-recorded owing to the remoteness of the moorland and mountainside habitats it occupies. The habitat of this moth, Arctostaphylos heath, is threatened by a range of factors including over-grazing, afforestation and neglect.	5.2	Site safeguard and management
		5.2.1	Where possible, ensure that occupied and nearby potential habitat is appropriately managed by 2005, considering management agreements where this will improve long-term results. (ACTION: SNH)
		5.2.2	Ensure that existing populations do not become fragmented by management practices or development. (ACTION: FC, LAS, SNH)
		5.2.3	Ensure that this species is included in site management documents for relevant SSSIs. (ACTION: SNH)
1.3	In Great Britain this species is classified as Rare.	5.3	Species management and protection
		5.3.1	None proposed
2.	Current factors causing loss or decline	5.4	Advisory
2.1	Inappropriate moorland management, including neglect.	5.4.1	Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: SNH)
2.2	Uncontrolled burning	5.5	Future research and monitoring
2.3	Over-grazing.	5.5.1	Undertake further surveys to determine the range and status of the netted mountain moth. (ACTION: SNH)
3.	Current action	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: SNH)
3.1	Some of the occupied sites are SSSIs and/or nature reserves, including NNRs.	5.5.3	Establish a regular monitoring programme for this moth. (ACTION: SNH)
3.2	Some colonies of the moth were surveyed for SNH in 1996.	5.5.4	Encourage research on the ecology and conservation of this species at an international level, and use the experience gained to inform its conservation in the UK. (ACTION: JNCC, SNH)
4.	Action plan objectives and targets	5.5.5	Pass information gathered during survey and monitoring of this moth to a central database for incorporation into national and international databases. (ACTION: SNH)
4.1	Maintain populations at all known sites.	5.6	Communications and publicity
4.2	Enhance the population size at known sites by 2010.	5.6.1	Promote opportunities for the appreciation of this moth and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: SNH)
5.	Proposed action with lead agencies		
	The main priorities for the netted mountain moth are to ensure that suitable management is implemented on known sites, and to prevent fragmentation of occupied patches. Surveys will be required to clarify the status of this species, and research will be necessary to elucidate its habitat requirements.		

5.7 Links with other action plans

- 5.7.1 This action plan should be considered in conjunction with that for upland heathland.

Black-veined moth (*Siona lineata*)

Action Plan

1.	Current status	5.1.1	Where appropriate, incorporate the requirements of the black-veined moth when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)
1.1	The black-veined moth is a species of lowland calcareous grasslands. The main larval foodplant in the UK is marjoram <i>Origanum vulgare</i> , and the larvae probably also feed on the leaves of other herbs. All of the surviving sites are dominated by tor-grass <i>Brachypodium pinnatum</i> and moderate sward heights of 10-25 cm are preferred.	5.2	Site safeguard and management
1.2	This moth is now apparently restricted to four fields on chalk in Kent. Formerly the moth was more widespread, with populations in other parts of Kent, in Somerset, Dorset, Sussex, and Essex, with single records from Gloucestershire and Hertfordshire. This species has been recorded from most countries in Europe eastwards to Siberia.	5.2.1	Where possible, ensure that all occupied and nearby potential habitat in the former range is appropriately managed by 2005. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.	5.2.2	Increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN)
2.	Current factors causing loss or decline	5.2.3	Ensure that the habitat requirements of the black-veined moth are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)
2.1	Inappropriate grassland management leading to scrub encroachment.	5.2.4	Ensure that black-veined moth is included in site management documents for all relevant SSSIs. (ACTION: EN)
2.2	Accidental or deliberate burning.	5.2.5	Consider notifying as SSSI sites supporting populations of this species if necessary to secure their long-term protection and appropriate management. (ACTION: EN)
3.	Current action	5.3	Species management and protection
3.1	The species has been the subject of an EN Species Recovery Programme project since 1995.	5.3.1	Initiate a programme of captive breeding to provide material for experimental study and reintroduction. (ACTION: EN)
3.2	Two of the occupied sites are SSSIs.	5.3.2	Reintroduce the black-veined moth to a series of sites within the former range if necessary to establish 10 new viable populations by 2005. (ACTION: EN)
4.	Action plan objectives and targets	5.3.3	Enforce current legislation in cases of collecting. (ACTION: EN, Police authorities)
4.1	Maintain populations at all known sites.	5.4	Advisory
4.2	Restore at least 10 viable populations, each on at least 5 ha of suitable habitat, within the former range by 2005.	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
5.	Proposed action with lead agencies	5.5	Future research and monitoring
5.1	The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research should focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.	5.5.1	Undertake surveys to determine the status of the species. (ACTION: EN)
5.1	Policy and legislation	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN)
		5.5.3	Establish a regular monitoring programme for the species, including an assessment of occupied and potential sites, to monitor the effectiveness of management agreements. (ACTION: EN)

- 5.5.4 Pass information annually from survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
- 5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the black-veined moth and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Four-spotted moth (*Tyta luctuosa*) Action Plan

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| <p>1. Current status</p> <p>1.1 The four-spotted moth is a grassland species which is typically found on south-facing banks on well-drained soils with sparse vegetation and bare earth. The larva feeds on field bindweed <i>Convolvulus arvensis</i>, preferring the flowers and seeds initially.</p> <p>1.2 This moth was formerly widespread and fairly common in England south of a line from Norfolk to Somerset. There has been a massive decline since the 1930s, and recently it has been reported from only 11 counties in southern England, chiefly on limestone grassland or in the Breckland. The moth has been recorded from every country in Europe except Ireland and Norway. The range extends eastwards to western Siberia and includes Morocco.</p> <p>1.3 In Great Britain this moth is classified as Vulnerable.</p> | <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that occupied and nearby potential habitat are appropriately managed by 2005. (ACTION: EN, MAFF)</p> <p>5.2.2 Where possible, increase the available habitat on the known sites and in adjacent sites, and attempt to link up existing fragments of habitat. (ACTION: EN, MAFF)</p> <p>5.2.3 Ensure that the habitat requirements of four-spotted moth are taken into account in relevant development policies, plans and proposals. (ACTION: LAs)</p> <p>5.2.4 Ensure that the four-spotted moth is included in site management documents for all relevant SSSIs. (ACTION: EN)</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Loss of habitat due to agricultural intensification and development.</p> <p>2.2 Inappropriate grassland management.</p> | <p>5.3 Species management and protection</p> <p>5.3.1 Reintroduce the four-spotted moth to a series of sites within the former range if necessary to restore 10 new viable populations by 2010. (ACTION: EN)</p> |
| <p>3. Current action</p> <p>3.1 Several occupied sites are SSSIs. Breckland is a proposed SAC.</p> | <p>5.4 Advisory</p> <p>5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN, MAFF)</p> <p>5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: EN, MAFF)</p> |
| <p>4. Action plan objectives and targets</p> <p>4.1 Maintain populations at all known sites.</p> <p>4.2 Enhance the population size at all known sites by 2010.</p> <p>4.3 Restore viable populations to 10 new sites throughout the former range of the moth by 2010.</p> | <p>5.5 Future research and monitoring</p> <p>5.5.1 Undertake surveys to determine the status of the species. (ACTION: EN)</p> <p>5.5.2 Conduct targeted autecological research to identify the precise habitat requirements of the species by 2000. (ACTION: EN)</p> <p>5.5.3 Establish a regular monitoring programme for the species, including an assessment of potential sites to monitor the effectiveness of management agreements. (ACTION: EN)</p> <p>5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)</p> |
| <p>5. Proposed action with lead agencies</p> <p>The objectives of the plan will be achieved by encouraging beneficial land management on existing sites, surveying all available habitat for undiscovered populations, and restoring a network of habitat, if necessary with introductions of the species, to combat potential isolation effects. Research will focus on the ecological requirements of the species, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the population which may be due to isolation.</p> | <p>5.6 Communications and publicity</p> <p>5.6.1 Promote opportunities for the appreciation of the four-spotted moth and the conservation issues associated with</p> |
| <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)</p> | <p>5.6.1 Promote opportunities for the appreciation of the four-spotted moth and the conservation issues associated with</p> |

its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Sword-grass (*Xylena exsoleta*) Action Plan

1.	Current status	5.2	Site safeguard and management
1.1	The sword-grass has been recorded in a wide range of habitats, mostly in uplands and moorlands. The larval ecology in the wild is almost unknown. In captivity the larvae will eat the foliage of various herbaceous plants, including broadleaved dock and the leaves of some woody plants, including hawthorn, blackthorn and bird cherry, but they are selective and by no means widely polyphagous.	5.2.1	Where possible, ensure that all occupied and nearby potential habitat is appropriately managed, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)
1.2	The sword-grass has been recorded from every country in Europe except Luxembourg and Albania. It reaches Iceland and its range extends to Japan. In the UK this moth was formerly widespread but has undergone a substantial decline since the 1960s. Since 1980 it has been recorded only occasionally in England, usually as singletons. In Wales and Northern Ireland the species is sparsely recorded but is still resident. Only in Scotland, including Shetland and Fair Isle, is the moth still being recorded regularly in numbers at various upland sites, and it is probably breeding over large areas here.	5.2.2	Where possible, increase the available habitat on the known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)
		5.2.3	Ensure that the existing populations do not become fragmented by management practices or development. (ACTION: CCW, EHS, EN, LAs, SNH)
		5.2.4	Ensure that the habitat requirements of this species are taken account of in relevant development policies, plans and proposals. (ACTION: CCW, EHS, EN, LAs, SNH)
		5.2.5	Ensure that the sword-grass is included in site management documents for all relevant SSSIs/ASSIs. (ACTION: CCW, EHS, EN, SNH)
1.3	In Great Britain this species is classified as Nationally Scarce.	5.3	Species management and protection
2.	Current factors causing loss or decline	5.3.1	None proposed.
2.1	Not known.	5.4	Advisory
3.	Current action	5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)
3.1	Some of the occupied sites are SSSIs.	5.4.2	As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Maintain populations at all known sites.	5.5.1	Undertake surveys to determine current status of this species. (ACTION: CCW, EHS, EN, SNH)
4.2	Enhance the population size at all known sites by 2010.	5.5.2	Conduct targeted autecological research to elucidate the causes of decline and inform habitat management. (ACTION: CCW, EHS, EN, SNH)
5.	Proposed action with lead agencies	5.5.3	Establish a regular monitoring programme for the species. (ACTION: CCW, EHS, EN, SNH)
	The recovery of sword-grass will be dependent on encouraging beneficial land management on existing sites and suitable habitat nearby, and undertaking surveys for undiscovered colonies. Research should focus on the ecological requirements of the moth, monitoring the effects of habitat management designed to meet these needs, and detection of any changes in the populations which may be due to isolation of colonies.	5.5.4	Pass the information gathered during survey and monitoring of this species to a central database for
5.1	Policy and legislation		
5.1.1	Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)		

incorporation in national and international databases.
(ACTION: CCW, EHS, EN, SNH)

5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK.
(ACTION: CCW, EHS, EN, JNCC, SNH)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the sword-grass and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets.
(ACTION: CCW, EHS, EN, SNH)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with that for upland heathland.

Slender Scotch burnet (*Zygaena loti scotica*) Action Plan

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| 1. | Current status | 3.1 | The slender Scotch burnet is included in the SNH Species Action Programme. |
| 1.1 | The colonies of the slender Scotch burnet are on steep south - or south-west - facing slopes, usually below coastal cliffs. The slopes have thin base-rich soils and short, early successional vegetation that is maintained by erosion and grazing. The larvae bask near the foodplant, common bird's-foot trefoil, in areas open to the sun, for example on stones, bare soil or moss cushions. Larvae of the moth are absent from tall grass swards even though the foodplant may be present. Where grazing has been relaxed, bracken invasion has reduced the area available to some colonies. A proportion of the slender Scotch burnet larvae may re-enter diapause after emerging from hibernation. The number of successive years they can do this is not known. This diapause may explain some of the large annual fluctuations in the size of the adult population. The main colonies on Mull may function as one or two metapopulations, depending on the periodic re-creation of small patches of suitable habitat by grazing and natural erosion. Two of the known colonies are highly isolated, and suitable habitats elsewhere in the range are unlikely to be colonised. Potential colonisation is limited because the adults are largely sedentary; few stray beyond the immediate boundaries of colonies. | 3.2 | All known colonies were surveyed in 1997. |
| | | 3.3 | Habitat management for this species is being undertaken on some sites. |
| | | 3.4 | All but five of the existing populations are within an SSSI and a National Trust For Scotland property. The requirements of the species are included in the relevant SSSI management plans. |
| | | 3.5 | Monitoring transects were established on six sites in 1995. |
| | | 4. | Action Plan Objectives and Targets |
| | | 4.1 | Maintain populations at all known sites. |
| | | 4.2 | Enhance population size at known sites by 2010. |
| | | 4.3 | Maintain and seek to enhance current metapopulation links between colonies by 2010. |
| | | 5 . | Proposed Actions with Lead Agencies |
| 1.2 | <i>Z. loti</i> is widespread in central Europe, occurring north to the Baltic, south to the Mediterranean and east to the Caucasus and northern Iran. However, the subspecies <i>scotica</i> is presumed to be endemic to Scotland. The slender Scotch burnet has a very limited distribution within the UK; it is now confined to the islands of Mull and Ulva. Colonies are known to have become extinct on Morvern and at two sites in northern Mull. Further areas near existing populations on Mull were once occupied, and the existing colonies have contracted in size and extent. Previous decline and the status of the individual colonies suggest that, unless action is taken, further decline is probable. Any such decline will lead to the further isolation of the existing colonies, and increasing risk of eventual extinction of this species in the UK. | | The main priorities under this plan are to ensure correct management of the areas occupied by the colonies, and to enhance the number and strength of populations, by improving habitat quality and by reducing habitat fragmentation. Further autecological studies may need to be undertaken to investigate the factors affecting populations. |
| 1.3 | In Great Britain the slender Scotch burnet is classified as Rare. | 5.1 | Policy and legislation |
| | | 5.1.1 | Where appropriate, include the requirements of this species when preparing or revising prescriptions for agri-environment schemes, including the Argyll Islands ESA. (ACTION: SNH, SOAEFD) |
| | | 5.1.2 | When considering land management grant applications, such as the Woodland Grant Scheme, in the vicinity of colonies, take the distribution and requirements of the moth into account. (ACTION: FC, SNH) |
| 2. | Current factors causing loss or decline | 5.2 | Site safeguard and management |
| 2.1 | Inappropriate grazing levels. | 5.2.1 | Where possible, ensure that all occupied and potential habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: SNH, SOAEFD) |
| 2.2 | Afforestation. | | |
| 2.3 | Isolation of colonies. | 5.2.2 | Where possible, increase the available habitat at known sites and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: SNH) |
| 3. | Current action | | |

- 5.3 Species management and protection
 - 5.3.1 None proposed.
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: SNH)
- 5.5 Future research and monitoring
 - 5.5.1 Every three years, confirm current status by surveying the distribution, extent, size and management of all known colonies. (ACTION: SNH)
 - 5.5.2 Continue annual monitoring of adult abundance and habitat condition at all sites with existing transects. (ACTION: SNH)
 - 5.5.3 Consider experiments on the efficacy of different methods of creating additional habitat near existing colonies. (ACTION: SNH)
 - 5.5.4 Survey other areas of potential habitat on south-facing basalt slopes in the Inner Hebrides. (ACTION: SNH)
 - 5.5.5 Encourage the investigation of factors affecting the abundance, survival, development and diapause of the larvae, including interactions with the parasitoid complex of this moth. (ACTION: SNH)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the slender Scotch burnet and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: SNH)
- 5.7 Links with other action plans
 - 5.7.1 This plan should be considered in conjunction with those for upland calcareous grassland, and maritime cliffs and slopes.

New Forest burnet (*Zygaena viciae argyllensis*) Action Plan

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|-----|---|-------|--|
| 1. | Current status | 3.3 | The New Forest burnet is included in the SNH Species Action Programme. |
| 1.1 | The New Forest burnet inhabits relatively long grassland where its larvae feed on meadow vetchling and bird's-foot trefoil. When discovered in 1963 the site in western Argyll was only lightly grazed and the moths were widespread. However, the area became heavily grazed, and no New Forest burnet moths were found at the site between 1986 and 1989. It was thought that the population could be extinct. However, the moth was rediscovered in 1990 on a single ledge where the vegetation had been inaccessible to sheep during the preceding period of heavy sheep grazing. Fences were erected in 1991, and since then the vegetation has begun to recover and the moth is beginning to recolonise the bulk of the site. | 3.4 | The known colony is monitored annually, and the extent of the larval foodplant on the site is also mapped annually. |
| | | 4. | Action plan objectives and targets |
| | | 4.1 | Maintain the population size at the known site. |
| | | 4.2 | Enhance the population size at the known site to a target population of over 250 adults by 2010. |
| | | 5. | Proposed action with lead agencies |
| | | | The main focus for action is to continue to restore the extant site to a suitable condition for the New Forest burnet, thus aiding its recovery. Further isolated colonies of the moth may exist in the area and it is important to continue the search. |
| 1.2 | In Europe <i>Z. viciae</i> is found from the northern Iberian Peninsula to southern Scandinavia. Its range extends eastwards into the Balkans, northern Iran, the Caucasus, and into Russia as far as eastern Siberia. Scattered populations also occur in Mongolia and central Asia. It was first found in Britain in 1869 in the New Forest. The populations in the New Forest represented a distinct subspecies, <i>Z. viciae ytenensis</i> , but the last specimen was caught in 1927 and no more colonies have been found since. The New Forest burnet was thought to be extinct in the British Isles until it was discovered at a single site in western Argyll, in 1963. This isolated population represents a second distinct endemic subspecies: <i>Z. viciae argyllensis</i> . Since 1963 several other apparently suitable sites have been surveyed in western Argyll but the moth has not been found away from the original site. | 5.1 | Policy and legislation |
| | | 5.1.1 | None proposed. |
| | | 5.2 | Site safeguard and management |
| | | 5.2.1 | Maintain the condition of the fence to permit exclusion or managed grazing by domestic herbivores under the management agreement. (ACTION: SNH) |
| | | 5.2.2 | Where possible, increase the available habitat at the known site. (ACTION: SNH) |
| 1.3 | In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981. | 5.3 | Species management and protection |
| | | 5.3.1 | Continue to take account of the New Forest burnet in the SSSI management agreement. (ACTION: SNH) |
| | | 5.3.2 | Enforce current legislation in cases of collecting. (ACTION: Police authorities, SNH) |
| 2. | Current factors causing loss or decline | 5.4 | Advisory |
| 2.1 | Accidental sheep grazing. | | |
| 2.2 | Isolation of the single colony. | | |
| 2.3 | Collecting of adults or larvae. | 5.4.1 | Maintain liaison with the owners and managers of the estate. (ACTION: SNH) |
| 3. | Current action | 5.5 | Future research and monitoring |
| 3.1 | The site is within an SSSI notified, in part, for its Lepidoptera. The requirements of the New Forest burnet are included in an SNH management agreement with the owner. | 5.5.1 | Re-sample the vegetation and analyse any changes every 3-5 years using the results to inform management of the site. (ACTION: SNH) |
| 3.2 | The site was fenced by NCC (Scotland) in 1991 to exclude sheep. Additional fencing and repairs have been carried out since then. | 5.5.2 | Continue to monitor the moth population annually using the results to inform management of the site. (ACTION: SNH) |

- 5.5.3 Undertake surveys to clarify the distribution of this species. (ACTION: SNH)
- 5.5.4 Conduct targeted autecological research to inform habitat management. (ACTION: SNH)
- 5.5.5 Encourage research on the ecology and conservation of this species at an international level, and use the experience gained towards its conservation in the UK. (ACTION: SNH, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Where it is consistent with maintaining site confidentiality, promote opportunities for the appreciation of the New Forest burnet moth, and the measures being taken to conserve it. (ACTION: SNH)
- 5.7 Links with other action plans
 - 5.7.1 None proposed.

Northern brown argus (*Aricia artaxerxes*) Species Statement

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|--|---|
| <p>1. Current status</p> <p>1.1 The northern brown argus occurs on well-drained, and usually base-rich, sites on thin soils that are usually south facing and up to 350 m altitude. Its larvae feed on common rock rose. Primarily occurring on limestone grassland, it is also associated with coastal valleys and quarries, limestone pavement and outcrops. The lightly grazed or ungrazed grassland habitat often has a profusion of the larval food plant, nectar sources such as thyme and bird's-foot trefoil, and patches of bare ground resulting from grazing, landslips, footpaths or rock outcrops. In Scotland, the northern brown argus is also found on sites with relatively low pH dominated by heathers, but these are always well-drained. The taxonomic status of the <i>Aricia</i> complex is unclear across Europe and is the subject of current research at the University of Birmingham.</p> <p>1.2 The northern brown argus is represented in Britain by two subspecies, both of which may be endemic. Closely related species, which may prove to be conspecific, occur across the western Palearctic from Spain and northern Africa to central Asia. Populations are believed to be relatively stable in most areas, although in some countries, such as Poland, they have undergone a massive decline. In England the northern brown argus is locally distributed in the Derbyshire Peak District, Yorkshire, Cumbria and County Durham. In southern Scotland, it is found in the Borders, along the east coast and in Dumfries and Galloway in the west, but then has a primarily eastern distribution northwards through Fife and Grampian to south-east Sutherland, with strong populations in Perthshire and northern Tayside. Small populations may occur in Clwyd, North Wales, but their taxonomic status is unclear. There has been a decline in range, with extinctions in southern Scotland, Northumberland and Yorkshire. Recent surveys, however, have located several new colonies in northern Scotland where the species is under recorded.</p> <p>1.3 In Great Britain the northern brown argus is classified as Nationally Scarce. It is protected under Schedule 5 of the Wildlife and Countryside Act 1981, with respect to sale only.</p> | <p>3. Current action</p> <p>3.1 A species action plan, grant-aided by CCW, EN, SNH and WWF, was published by Butterfly Conservation in 1996.</p> <p>3.2 Some reduction in grazing on reserves has been carried out, for example at St Abb's Head NNR in the Borders.</p> <p>3.3 Reintroductions of the species have been attempted in Durham.</p> <p>3.4 SNH is preparing an information and advice note on habitat management for this butterfly.</p> <p>4. Objective for the species</p> <p>4.1 Maintain the range of the northern brown argus.</p> <p>5. Proposed action</p> <p>5.1 Monitoring only. The requirements of the species should be taken into account in the delivery of the action plan for lowland calcareous grassland.</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Inappropriate grazing management.</p> <p>2.2 Afforestation in parts of Scotland.</p> | |

Toadflax brocade (*Calophasia lunula*) Species Statement

1. Current status

- 1.1 The toadflax brocade occurs on shingle at Dungeness, and less commonly on roadside verges, waste ground and in gardens where the food plant grows in open situations. Its larvae chiefly occur on yellow toadflax *Linaria vulgaris*, but also on other *Linaria* spp and on small toadflax *Chaenorhinum minus*.
- 1.2 Resident populations of toadflax brocade are confined to a few sites on the south coasts of Kent and Sussex. The moth has declined recently and is seldom reported away from Dungeness. It has been recorded from almost every country in Europe, from the Mediterranean to southern Norway. Its range extends through Asia Minor east to the Amur and Ussuri regions. It is an established introduction in North America.
- 1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

- 2.1 This species is at the northern limit of its range in Britain and is probably limited by climate rather than habitat, with retractions in range during unfavourable climatic periods.
- 2.2 Coastal development, sea defence work and road-widening projects threaten remaining habitat.

3. Current action

- 3.1 Nuclear Electric at Dungeness have been made aware of the importance of the site around their power station and associated holdings.
- 3.2 Some of the breeding areas are within SSSIs, including Dungeness (a proposed SAC) and Folkestone Warren.

4. Objective for the species

- 4.1 Maintain existing populations of the toadflax brocade.

5. Proposed action

- 5.1 Monitoring only. The requirements of the species should be considered in the implementation of the coastal vegetated shingles action plan.

White-spot (*Hadena albimacula*) Species Statement

1. Current status
 - 1.1 The white-spot is a moth of shingle or calcareous cliffs, the larvae feeding on the seed capsules of Nottingham catchfly *Silene nutans*.
 - 1.2 Single populations are known at Dungeness (Kent), near Gosport (Hampshire), and at least one site on the south coast of Devon between Sidmouth and Seaton. Records suggest there may be other populations on the south coasts of Dorset, Kent and the Isle of Wight. All three known populations are very localised and vulnerable to existing threats. Records suggest that in Devon the population, and its area of occupancy, has declined substantially over the last 25 years. The moth has been reported from every country in Europe except Ireland, Luxembourg, Albania and the island of Malta, and the range extends to western Siberia, Iran and Morocco. It becomes rarer and more coastal in the north of its range.
 - 1.3 In Great Britain this species is classified as Vulnerable.
2. Current factors causing loss or decline
 - 2.1 Recreation, small-scale coastal developments, and coastal defence work.
 - 2.2 Commercial extraction of shingle, gravel and sand.
3. Current action
 - 3.1 Part of the Dungeness area is within the grounds of a Nuclear Electric power station and receives some protection. Dungeness is a candidate SAC.
 - 3.2 Surveys of the adult moth at Dungeness took place in 1988 and 1989, jointly funded by Nuclear Electric and the Nature Conservancy Council.
4. Objective for the species
 - 4.1 Maintain existing populations of the white-spot.
5. Proposed action
 - 5.1 Monitoring only. The requirements of the species should be considered in conjunction with the action plans for coastal vegetated shingles, and maritime cliffs and slopes.

Marsh mallow moth (*Hydraecia osseola hucherardi*) Species Statement

1. Current status

- 1.1 The marsh mallow moth is named after the sole larval foodplant of the species, marsh mallow *Althaea officinalis*, which is found in damp, low-lying places by water courses.
- 1.2 This moth formerly bred widely in the Romney Marsh to Rye area on the border of East Sussex and Kent, but it now appears to be restricted to a single site here. There is also a single population on the banks of the Medway between Maidstone and Rochester, Kent. The moth has an extremely restricted distribution in Europe, with a few scattered colonies in France, Spain, Italy, Sardinia, Romania and Greece. Its range extends to southern Russia.
- 1.3 In Great Britain this species is now classified as Rare.

2. Current factors causing loss or decline

- 2.1 Destruction of the foodplant due to agricultural practices including land drainage, frequent and extensive mechanised ditch clearance, use of herbicides and overgrazing by sheep.

3. Current action

- 3.1 Both extant populations are on SSSIs, one of which is a nature reserve of the Kent Trust for Nature Conservation.
- 3.2 Surveys of the known populations and potential habitat in the vicinity were undertaken between 1993 and 1996 by a partnership between JNCC, EN, Butterfly Conservation and the Sussex Moth Group.

4. Objective for the species

- 4.1 Maintain existing populations of the marsh mallow moth.

5. Proposed action

- 5.1 Monitoring only. The requirements of the species should be considered in the implementation of the coastal grazing marshes action plan.

Drab looper (*Minoa murinata*) Species Statement

1. Current status

1.1 The larva of the drab looper feeds on wood spurge *Euphorbia amygdaloides*, preferring the flowers and floral leaves of plants growing in full sun. Both the moth and the food plant are associated with areas of recent felling and coppicing in woodland. Males fly in sunshine in the middle of the day.

1.2 In the UK this species has two centres of distribution, one extending from Gloucestershire and Monmouthshire northwards through Herefordshire and Worcestershire, and the other centred on Hampshire and including south Wiltshire, Berkshire and West Sussex. There are outlying colonies in Somerset, Kent and, possibly, South Wales. It has been lost from many woods in these areas. It formerly occurred in Oxfordshire and eastwards to Bedfordshire and Essex, where it has been lost since the 1940s. The moth has been reported from most countries in central and southern Europe, from the Mediterranean north to Poland, but does not reach Scandinavia or Ireland.

1.3 In Great Britain this species is classified as Nationally Scarce.

2. Current factors causing loss or decline

2.1 Cessation of woodland coppice management.

2.2 Replacement of small-scale rotational felling by management of large-scale plantations of even-aged tree crops, particularly conifers.

3. Current action

3.1 Many of the surviving colonies are on SSSIs.

4. Objective for the species

4.1 Maintain the range of the drab looper.

5. Proposed action

5.1 Monitoring only. The requirements of the drab looper should be considered in the implementation of the lowland beech woodland action plan.

Scarce merveille du jour (*Moma alpium*) Species Statement

1. Current status

1.1 The scarce merveille du jour is associated with large pedunculate and sessile oak trees (*Quercus robur* and *Q. petraea*). It is thought that the egg is laid and larvae feed in the tree canopy. Emergence from the pupa may be delayed for several years, giving rise to apparent large fluctuations in population size. The ecology of this species is poorly known and the link with large oak trees not fully understood.

1.2 This moth is found only in semi-natural ancient woodland with mature oaks within 80 km of the coast. Current strongholds are in Wiltshire, Hampshire and West Sussex, with colonies in East Sussex, Kent, Cornwall and Devon, but it has probably disappeared from Suffolk and Essex. Current population trends may be static, and there may be undiscovered populations in Devon and Cornwall. This moth is widely distributed in Europe as far north as Sweden.

1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

2.1 Clearance of oak woodlands.

2.2 Woodland management leading to the non-replacement of mature oak trees.

3. Current action

3.1 The New Forest is a candidate SAC. Ham Street is a NNR.

3.2 The Cornish site is monitored regularly in conjunction with FE and further surveys have been conducted in suitable woodlands.

4. Objective for the species

4.1 Maintain the range of the scarce merveille du jour.

5. Proposed action

5.1 Monitoring only. It is likely that the scarce merveille du jour may benefit from the action plans for other species of lowland oakwoods, including the light crimson underwing *Catocala promissa* and the dark crimson underwing *Catocala sponsa*. The requirements of the species should be considered in the implementation of the lowland wood pastures and parklands action plan.

Clay fan-foot (*Paracolax tristalis* = *derivalis*) Species Statement

1. Current status

- 1.1 The clay fan-foot is usually associated with small sheltered clearings and coppiced areas in woodland. The larva has been beaten from the foliage of oak *Quercus* spp in the autumn. It probably feeds on fallen leaves of oak and other broadleaves initially, and possibly on herbaceous plants in the spring.
- 1.2 This moth occurs very locally in a few woodlands in Kent, Sussex and Surrey. It was formerly present in Essex, Hampshire and south Wiltshire. It has suffered a 70% decline in area of occupancy within its historic range in south-east England. Old records from North Wales and Cheshire are erroneous. The clay fan-foot is widespread in southern Europe, becoming increasingly local and coastal farther north, and extends to southern Russia, China and Iran.
- 1.3 In Great Britain this species is classified as Nationally Scarce.

2. Current factors causing loss or decline

- 2.1 Cessation of traditional coppice management.
- 2.2 Replacement of small-scale rotational felling by management of large-scale plantations of even-aged tree crops, particularly conifers.

3. Current action

- 3.1 Most of the known surviving populations are on SSSIs.
- 3.2 The FC Woodland Improvement Grants for coppice restoration particularly the Coppice for Butterflies Challenge will help improve some habitats for this species.

4. Objective for the species

- 4.1 Maintain existing populations of the clay fan-foot.

5. Proposed action

- 5.1 Monitoring only. The species could benefit from the action plans for other species of lowland coppiced woodlands, including common fan-foot *Pechipogo strigilata* and drab looper *Minoa murinata*. The requirements of the species should be considered in the implementation of the lowland wood pastures and parklands action plan.

Cousin German (*Paradiarsia sobrina*) Species Statement

1. Current status

1.1 The larva of the cousin German feeds initially on the foliage of bilberry and lingbut, after over-wintering, it will climb low scrubby birch to complete its development on the young leaves. It is associated with birch woods and old Caledonian pine forest with widely spaced trees.

1.2 In Europe the cousin German occurs widely in the Scandinavian countries, with more localised populations in the mountains of central Europe, the Alps, the Pyrenees and Romania. Its range extends eastwards through the taiga in Russia, across the Urals to north-east Siberia and Korea. In the UK it has a scattered distribution in the central Scottish Highlands, where it is known from fewer than 15 ten kmsquares, although it is almost certainly under-recorded. Most of the records of this moth are from Rannoch and Aviemore, but there are also records from other parts of Strathspey and from the Dee Valley. In 1994 it was discovered in Wester Ross, in some of the most northerly Caledonian pine forest in Britain.

1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

2.1 Inappropriate grazing management of birch and pinewood pasture.

2.2 Burning.

3. Current action

3.1 Some of the occupied sites are SSSIs and/or nature reserves, including NNRs.

4. Objective for the species

4.1 Maintain the range of the cousin German.

5. Proposed action

5.1 Monitoring only. It is likely that this species will benefit from the action plans for other species of Scottish pinewoods, including the Scottish wood ant *Formica aquilonia* and twinflower *Linnaea borealis*. The requirements of the species should be considered in the implementation of the native pine woodland action plan.

Small lappet (*Phyllodesma ilicifolia*) Species Statement

1. Current status
 - 1.1 The small lappet is a moorland species whose larval foodplant in Britain is bilberry *Vaccinium myrtillus*, although on the dunes of western Jutland the larvae are fairly common on creeping willow *Salix repens* and bog whortleberry *Vaccinium uliginosum*.
 - 1.2 This species was recorded historically from a few moorland sites from Yorkshire to Devon, but its continued presence is uncertain. The last confirmed record was of an adult in Somerset in 1965. A published report of several larvae from a site in Somerset in 1985 and 1986 is without foundation. In view of the sporadic nature of past records, and the extent of moorland habitat, there is a reluctance to presume the species extinct. The species has been reported from most countries in Europe including southern Norway and Sweden. The range extends to Siberia and Japan.
 - 1.3 In Great Britain this species is now classified as Rare.
2. Current factors causing loss or decline
 - 2.1 Not known.
3. Current action
 - 3.1 Some of the former sites are SSSIs.
4. Objective for the species
 - 4.1 Maintain any discovered populations of the small lappet.
5. Proposed action
 - 5.1 Search only.

Black-banded (*Polymixis xanthomista*) Species Statement

1. Current status
 - 1.1 In Britain the black-banded is entirely coastal and occurs mainly on cliffs. The larvae feed chiefly on thrift (preferring plants growing close to the sea), whereas in Europe this species is largely restricted to mountains where the larvae feed on a variety of low-growing plants.
 - 1.2 The black-banded is widely distributed in central and southern Europe. In the UK, it has been found on the Isles of Scilly, along the coasts of Devon, Cornwall, Pembrokeshire and Cardiganshire, and on the Isle of Man. The moth is under-recorded and its current distribution is poorly known. It is possible that the moth occurs in other suitable habitats around the south-west coasts of England and Wales. Some of the populations may form extensive colonies. There is no evidence of recent decline.
 - 1.3 In Great Britain this species is classified as Nationally Scarce.
2. Current factors causing loss or decline
 - 2.1 None known.
3. Current action
 - 3.1 Many of the known sites are SSSIs and/or are owned by the National Trust. Some populations are contained within candidate SACs.
4. Objective for the species
 - 4.1 Maintain the range of the black-banded.
5. Proposed action
 - 5.1 Monitoring only. The requirements of the species should be considered in the delivery of the maritime cliffs and slopes action plan.

Olive crescent (*Trisateles emortualis*) Species Statement

1. Current status
 - 1.1 The larvae of the olive crescent feed initially in bunches of withering leaves of oak *Quercus* spp and beech *Fagus sylvatica* still attached to boughs, and later on recently fallen leaves on the ground.
 - 1.2 The moth has been known as a resident in the UK from only a small wooded area of the Chilterns in Buckinghamshire, where it has declined in recent years, and in two woods near the coast in north Essex. This moth has been reported from most European countries from Norway to Albania. It is widespread and not uncommon in parts of central Europe and southern Scandinavia. The range extends to eastern Siberia, China and northern Iran.
 - 1.3 In Great Britain this species is classified as Rare.
2. Current factors causing loss or decline
 - 2.1 Changes in woodland structure and management.
3. Current action
 - 3.1 At least part of both populations are within SSSIs.
4. Objective for the species
 - 4.1 Maintain the existing populations of the olive crescent.
5. Proposed action
 - 5.1 Monitoring only. The requirements of the species should be considered in the implementation of the lowland beech action plan.

Northern dart (*Xestia alpicola alpina*) Species Statement

1. Current status
 - 1.1 The northern dart is usually restricted to the tops of higher mountains, generally above 450m, although it occurs at lower altitudes in the extreme north and west of its range. The main larval foodplant is crowberry, but it may also feed on ling, and possibly on bilberry and bearberry. Larval development takes two years.
 - 1.2 This moth occurs in the Alps and the mountains of central Europe, and also extends north to the Arctic zones of Scandinavia and Russia. The form in the British Isles, which occurs in Scotland, northern England and north-west Ireland, is considered a distinct subspecies, *alpina*. The northern dart is under-recorded and its best known breeding areas are in the Cairngorms, the mountains south of Loch Rannoch, and in Cumbria. The moth also occurs on Harris, Lewis, the Orkney Islands and possibly on Shetland, and in the Cheviots.
 - 1.3 In Great Britain this species is classified as Nationally Scarce.
2. Current factors causing loss or decline
 - 2.1 Not known.
3. Current action
 - 3.1 Some of the occupied sites are SSSIs/ASSIs, NNRs or nature reserves.
4. Objective for the species
 - 4.1 Maintain the range of the northern dart.
5. Proposed action
 - 5.1 Monitoring only. The requirements of the species should be considered in the delivery of the upland heathland action plan.

Other invertebrates



Clubiona rosserae (a spider) (Order: Araneae) Action Plan

1.	Current status	5.2.1	Ensure that activities external to the extant sites do not further threaten the level of the water table. (ACTION: EA, EN)
1.1	Clubiona rosserae favours wet fen habitats and it has been recorded on several occasions in piles of cut sedge. Adults have been found in February, May, June, September and October. It was first described as recently as 1953, and it is possible that this species has been under recorded due to confusion with <i>C. stagnatilis</i> , a closely related and common species.	5.2.2	Where possible, ensure that all occupied habitat is appropriately managed, including management of encroaching scrub, by 2008. (ACTION: EN)
1.2	Clubiona rosserae has been found at only two sites in Britain: Chippenham Fen NNR (Cambridgeshire), and Tuddenham Fen (West Suffolk), which is part of the Cavenham Heath NNR. The population size at these two sites is not known. <i>C. rosserae</i> has also been found in Czechoslovakia, Poland and, possibly, Siberia.	5.2.3	Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN)
1.3	In Great Britain this species is classified as Endangered.	5.2.4	Consider notifying as SSSIs any newly-discovered sites holding key populations of <i>Clubiona rosserae</i> where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
2.	Current factors causing loss or decline	5.3	Species management and protection
2.1	Not known.	5.3.1	None proposed.
3	Current action	5.4	Advisory
3.1	Both of the localities where this species has been recorded in Britain are NNRs.	5.4.1	In the event of discovering populations at new sites, advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
4.	Action plan objectives and targets	5.5	Future research and monitoring
4.1	Maintain populations at all known sites.	5.5.1	Undertake surveys to determine the status of this species, including potentially suitable sites within a radius of 25 km of the extant sites. (ACTION: EN)
5.	Proposed action with lead agencies	5.5.2	Conduct targeted autecological research to inform habitat management. (ACTION: EN).
	This species is potentially threatened by changes in habitat quality at its known sites. To achieve the objectives of this plan it will be necessary to survey the two known sites to establish the status of the populations. If appropriate, potentially damaging changes caused by the lowering of the water tables should be assessed, and action taken to halt or reverse the changes. Other sites in the same area with the potential to hold populations of the species should also be surveyed.	5.5.3	Establish an appropriate monitoring programme for the species. (ACTION: EN)
		5.5.4	Pass the information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
5.1	Policy and legislation	5.6	Communication and publicity
5.1.1	Address the requirements of this species in the LEAP process and in relevant WLMPs. (ACTION: EA, EN, IDBs, LAs, MAFF)	5.6.1	Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
5.1.2	Take account of the species' requirements in response to applications for water abstraction licences. (ACTION: EA)	5.7	Links with other action plans
5.2	Site safeguard and management	5.7.1	This action plan should be considered in conjunction with that for fens.

Fen raft spider (*Dolomedes plantarius*)

(Order: Araneae)

Action Plan

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| <p>1. Current status</p> <p>1.1 The fen raft spider is a wetland spider dependent on permanent, standing or slow moving water. It is associated with nutrient-poor water of near neutral or alkaline pH. It lives on the surface of pools and ditches, and amongst emergent vegetation; typically it hunts from 'perches' on stems emerging from the water, taking a wide range of invertebrate prey on or below the surface. Emergent, stiff-leaved vegetation in open, sunny conditions is also required for the construction of nursery webs in which the young are reared.</p> <p>1.2 There are no reliable records of this species in the UK before its discovery in 1956, at Redgrave and Lopham Fen, on the Norfolk/Suffolk border. In 1988 it was discovered at a second site, the Pevensey Levels, Sussex, c160 km away. The Redgrave and Lopham Fen population has contracted progressively in range over the last 30 years and is now restricted to two, small, isolated centres. Since systematic monitoring began in 1991, numbers in these areas have fluctuated around very low levels, with no detectable temporal trends. The total population, probably of little over 100 adult females in most years, is highly vulnerable to stochastic extinction. The only survey of the Pevensey population in 1992 estimated that there were over 3000 adult females. The fen raft spider has been recorded throughout the Palaearctic. Under recording and confusion over identification make assessment of status difficult, but it appears to be declining and often under threat of extinction in western and central-southern Europe whilst remaining well established in Scandinavia and the Baltic States.</p> <p>1.3 In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.</p> | <p>3.2 The fen raft spider has been the subject of an EN Species Recovery Programme since 1991.</p> <p>3.3 Habitat restoration, initiated in 1993 at Redgrave and Lopham Fen by the Suffolk Wildlife Trust, with grant-aid from the EU Life Fund, has involved restoration of the fen's natural hydrology, extensive peat-stripping, scrub clearance and grazing.</p> <p>4. Action plan objectives and targets</p> <p>4.1 Achieve a ten-fold increase in the range of the population at Redgrave and Lopham Fen.</p> <p>4.2 Increase the population density throughout much of the range of Redgrave and Lopham Fen to a mean maximum of c15 individuals per pool (the maximum level supported since monitoring began in 1991).</p> <p>4.3 Maintain the density and range of the fen raft spider on the Pevensey Levels.</p> <p>4.4 Introduce populations to two suitable new sites by 2010.</p> <p>5. Proposed action with lead agencies</p> <p>Priority action for this species should be to ensure appropriate habitat management throughout both existing sites. The most important elements of this are the maintenance of summer water levels, water quality and suitable emergent vegetation. Translocations should be made to new sites to reduce the species' intrinsic vulnerability. Systematic monitoring is vital in assessing progress towards the targets, and in making appropriate adjustments to management.</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Water abstraction.</p> <p>2.2 Inappropriate ditch management.</p> <p>2.3 Deterioration in water quality.</p> <p>2.4 Loss of suitable wetland habitat.</p> | <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when revising prescriptions for relevant agri-environment schemes. (ACTION: EN, MAFF)</p> <p>5.1.2 Address the requirements of this species in the LEAP process and in relevant WLMPs. (ACTION: EA, IDBs, LAs, MAFF)</p> <p>5.1.3 Take account of the requirements of the species in response to applications for water abstraction licences. (ACTION: EA)</p> |
| <p>3. Current action</p> <p>3.1 Most of the Pevensey population occurs within the Pevensey Levels NNR/SSSI complex. The population at Redgrave and Lopham Fen occurs within an NNR, which is included within the Waveney and Little Ouse Valley Fens candidate SAC.</p> | <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that occupied and potential habitat is appropriately managed, including the maintenance of water quality and water levels, by 2005. (ACTION: EA, EN)</p> |

- 5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN)
- 5.3 Species management and protection
 - 5.3.1 Translocate spiders within existing sites where physical isolation prevents recolonisation of suitable habitat. (ACTION: EN)
 - 5.3.2 Introduce to a series of new sites in East Anglian and southern England to establish a new viable population in each region. (ACTION: EN)
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the fen raft spider and the importance of beneficial management for its conservation. (ACTION: EN).
- 5.5 Future research and monitoring
 - 5.5.1 Continue regular monitoring at Redgrave and Lopham Fen, and establish a regular monitoring programme for the species at Pevensey Levels and for newly established populations. (ACTION: EN)
 - 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: EN)
 - 5.5.3 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation. (ACTION: EN, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, and by a publicity leaflet, as well as by increasing opportunities for public viewing. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of fens and grazing marshes, including the freshwater molluscs *Anisus vorticulus* and *Segmentina nitida*.
 - 5.7.2 This plan should be considered in conjunction with those for coastal and floodplain grazing marsh, and fens.

Ladybird spider (*Eresus sandaliatus* = *cinnaberinus*)
(Order: Araneae)
Action Plan

1.	Current status	These specimens will not be used for establishment in the UK.
1.1	The ladybird spider is found on dry sandy heaths with bare or lichen covered patches, where it forms burrows in the sandy substrate and is protected from the wind by the surrounding heather. It preys on insects blundering into the external web. Females will only leave their burrows if conditions deteriorate and they have to relocate. Males only leave the burrow to mate, for a period of about two weeks in early summer. Females are able to survive for several years as adults before breeding. This species needs very warm, dry conditions and may not breed in wet years. The species has a long life cycle of up to eight years and may therefore be slow to respond to improved habitat conditions. Until recently this species was considered conspecific with <i>Eresus cinnaberinus</i> (= <i>niger</i>) but northern and montane European populations, including the British population, have been referred to <i>E. sandaliatus</i> .	4. Action plan objectives and targets 4.1 Maintain the population size at its known site. 4.2 Enhance the population size at Wareham Forest by 2010. 4.3 Restore populations to two suitable sites within the historic range by 2010. 4.4 Continue to support an ex-situ programme to provide material for reintroductions and ecological research.
1.2	Until the late 1920s the species was recorded from several sites in Dorset but it was then thought to have become extinct in Britain. Although was rediscovered in 1979, it is known from only a single site, in Wareham Forest, where the exceedingly small population is less than 300 adults. This is slowly increasing but the population remains vulnerable. There are likely, but unconfirmed records from Kynance Cove in Cornwall, the Undercliffs of the Isle of Wight, and Kirkby Moor in Lincolnshire. It is rare and apparently declining in northern Europe (Denmark, Germany, Netherlands and Sweden) and otherwise occurs only in areas of the Alps and the Pyrenees.	5. Proposed action with lead agencies The objectives for the ladybird spider will be achieved by continuing the regular monitoring of the known site so that management action can be immediate if the site is threatened. Other heathland areas within 30 km of the extant sites should be surveyed to establish their potential to support populations of the species, and to ensure that the species does not occur elsewhere. If the captive breeding programme is successful, then a similar programme will be established with British specimens and the offspring used to establish further colonies.
1.3	In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.	5.1 Policy and legislation 5.1.1 None proposed. 5.2 Site safeguard and management 5.2.1 Prevent external activities threatening the existing population. (ACTION: EN, FE) 5.2.2 Remove encroaching pine, Rhododendron, bracken and scrub at appropriate intervals to maintain areas of bare ground and to encourage the regeneration of heather. (ACTION: EN, FE) 5.2.3 Where possible, increase the available habitat at the known site and adjacent areas, and attempt to link up existing fragments of habitat. (ACTION: EN, FE) 5.2.4 If new populations are found on any SSSIs, ensure that the species is included in relevant site management documents. (ACTION: EN) 5.2.5 Consider notifying any newly discovered sites for the species as SSSIs. (ACTION: EN).
2.	Current factors causing loss or decline	5.3 Species management and protection
2.1	Encroachment and shading by Rhododendron, pine and bracken.	
2.2	Competition from southern wood ants may be a factor.	
3.	Current action	
3.1	The ladybird spider has been the subject of an EN Species Recovery Programme since 1991, under which FE has carried out extensive habitat management and enlargement of the occupied site.	
3.2	There has been regular monitoring of the known population and considerable survey for additional sites.	
3.3	An experimental captive breeding programme has been established with specimens imported from Denmark.	

- 5.3.1 Establish the ladybird spider on at least two additional sites within the former range by 2010. (ACTION: EN)
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of sites where the ladybird spider is introduced about the habitat requirements and site management requirements of this species. (ACTION: EN).
- 5.5 Future research and monitoring
 - 5.5.1 Undertake surveys to determine the status of the species. These should concentrate on heathland areas within a radius of 30 km of the extant site. (ACTION: EN)
 - 5.5.2 Continue monitoring of extant population and initiate monitoring of any establishments. (ACTION: EN)
 - 5.5.3 Consider genetic analysis of the population to identify inbreeding problems. If further colonies are discovered, take advice on the desirability of facilitating gene flow between populations, at least in the origination of new colonies. (ACTION: EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species, and the conservation issues associated with its habitat. Continue to use this species as a flagship to inform and popularise the problems faced by heathland invertebrates and spiders in general. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland heathland.

Lophopus crystallinus (a freshwater bryozoan)

(Order: Bryozoa)

Action Plan

1.	Current status	4.2	Facilitate natural increase in the number of populations by 2010.
1.1	Lophopus crystallinus is one of 11 freshwater bryozoans found in the UK, and is the only member of its family in this country. Bryozoans feed on minute organisms suspended in the water column. L. crystallinus lives in lakes, ponds, ditches and slow rivers, where it has been found growing on a variety of substrata including water plants, rocks, shells, wood and dead leaves. Bryozoans are hermaphrodites. Sexual reproduction produces a short-lived free-swimming stage. They also reproduce asexually in two ways: by 'budding' from the mature colony; and by producing statoblasts, a seed-like resting stage which is able to withstand environmental extremes and can remain dormant for several years. The characteristic floating statoblasts of L. crystallinus are the most likely means of long-distance dispersal.	5.	Proposed action with lead agencies The current threats to L. crystallinus are identified as pollution, water abstraction and inappropriate site management. The actions therefore aim to improve water quality and ensure adequate water supply at sites where this species occurs, and to promote positive habitat management to benefit the species. The lack of knowledge about L. crystallinus needs to be addressed through survey and autecological studies.
1.2	Since 1970 L. crystallinus has been found at only four sites: Bagmore Pit, Norfolk; Chil Brook, Oxfordshire; Barton Blow Wells, South Humberside; and near Westhoughton, Lancashire. There are older records from: near Port Meadow, Oxfordshire; several of the Norfolk and Suffolk Broads and waterways; Langmere, Norfolk; Hartwell, Buckinghamshire; Little Baddow, Essex; and Chelsea, Middlesex. A record from the River Ravensbourne, Kent, is undated. It is typical for records of this species at any particular site to be for a short period only; this may be a natural aspect of its ecology or because continual occurrences tend not to be reported. Lophopus crystallinus has been widely recorded in Europe but its current status outside Britain is not known.	5.1	Policy and legislation
1.3	In Great Britain this species is classified as Rare.	5.1.1	Address the requirements of this species in the LEAP process and in relevant WLMPs. (ACTION: EA, IDBs, LAs, MAFF)
2.	Current factors causing loss or decline	5.1.2	Take account of the species' requirements in response to applications for water abstraction licences. (ACTION: EA)
2.1	Eutrophication of water bodies.	5.2	Site safeguard and management
2.2	Water abstraction.	5.2.1	By 2004, reduce water abstraction from Barton Blow Wells aquifer and Breck aquifers. (ACTION: EA).
2.3	Over-tidying of water bodies, especially the removal of fallen wood.	5.2.2	Where possible, ensure that all occupied habitat is appropriately managed, including the reduction and elimination of sources of eutrophication or pollution, by 2008. (ACTION: EN).
3.	Current action	5.2.3	Ensure that this species is included in site management documents for all relevant SSSIs. (ACTION: EN).
3.1	Barton Blow Wells are within Barton & Barrow Clay Pits SSSI.	5.2.4	Consider notifying as SSSIs sites holding viable populations of this species, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)
4.	Action plan objectives and targets	5.3	Species management and protection
4.1	Maintain all long-term populations of Lophopus crystallinus.	5.3.1	None proposed.
		5.4	Advisory
		5.4.1	Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EA, EN)
		5.5	Future research and monitoring
		5.5.1	By 2004, assess the possibility of surveying for Lophopus crystallinus by examining sediments for

statoblasts, using pollen concentration techniques. (ACTION: EN).

- 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: EN, EA)
- 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. (ACTION: EA, EN)
- 5.5.4 Trawl for unpublished records through appeals in appropriate literature, and undertake surveys to determine the status of this species, by 2004. (ACTION: EN)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could also benefit *Bidessus unistriatus*.
 - 5.7.2 This plan should be considered in conjunction with those for aquifer-fed fluctuating waterbodies, wet woodlands, and mesotrophic lakes.

New Forest cicada (*Cicadetta montana*)
(Order: Hemiptera)
Action Plan

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| 1. | Current status | 3.2 | The best site is monitored for singing males, nymphal turrets, and egg nests in plants. |
| 1.1 | The New Forest cicada is the only representative of the Cicadidae in the UK. The species occurs on warm, south-facing, open scrub and woodland-edge sites and has an unusually long life cycle. Eggs are laid in woody stems and bracken and hatch during September to November. The tiny nymphs burrow into the ground where they feed on the roots of purple moorgrass <i>Molinia caerulea</i> and woody plants. They take 6-8 years to mature. Nymphs build small earthworks ('turrets') in March before emergence as adults in May and June. The winged adults live for about three weeks. | 3.3 | Surveys of suitable habitat are organised by EN, to include searches for cicadas near sites with recent records, and in the New Forest generally. |
| | | 3.4 | A species action plan, commissioned by EN, was written in 1995 and has been revised annually since then. |
| | | 4. | Action plan objectives and targets |
| | | 4.1 | Maintain all current populations. |
| 1.2 | The New Forest cicada is very rare, known with certainty from only two areas in the New Forest in the last 50 years, although there are some other doubtful records from other areas. Between 1941 and 1962 there were two records, but in 1962 a new site for nymphs and adults was discovered and 100 singing males were counted. The cicada has been monitored here since 1962, but there has been a long slow decline which is probably due to habitat change. There were occasional peak years (eg 30 turrets in 1986), which could relate to an eight-year life cycle. On a second site, singing has been heard occasionally up to 1994 and an adult was collected in 1990. In 1996 and 1997 there was no evidence of the occurrence of cicadas. In nearby European continental areas the species is uncommon, and has declined in alpine sites; it is commoner in parts of Russia and the Caucasus. | 4.2 | Enhance the population size at all known sites by 2020. |
| | | 4.3 | Establish populations at two suitable sites within the known range by 2020. |
| | | 4.4 | Establish an ex-situ programme for study and to provide material for reintroductions and ecological research |
| | | 5. | Proposed action with lead agencies |
| | | | The status of this species in the New Forest requires annual surveys of likely areas, with particular attention to the last two known sites, and of adjacent areas where dispersal might have occurred. The management and availability of suitable habitat is important, and involves FE in freeing small areas from forestry operations. Results cannot be achieved quickly because of the 6-8 year life cycle. A better understanding of the habitat is needed and may include studies of extant continental sites. Preparation for possible reintroduction involves testing the methodology for ex-situ breeding and, if no native cicadas can be found, this long-term work could begin by using continental stock. |
| 1.3 | In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981. | 5.1 | Policy and legislation |
| | | 5.1.1 | None proposed. |
| 2. | Current factors causing loss or decline | | |
| 2.1 | Natural succession to shaded woodland on ungrazed sites. | | |
| 2.2 | Loss of habitat due to intensive grazing on the common lands preventing bush regeneration. | | |
| 2.3 | Loss of open bush and deciduous tree habitats resulting from conifer forest management. | | |
| 2.4 | Extensive bracken invasion causing shading. | | |
| 2.5 | Trampling damage to turrets and egg nests between March and October. | | |
| 3. | Current action | | |
| 3.1 | The best known site for the New Forest cicada is managed by the FE, EN and the Hampshire Wildlife Trust to provide optimal habitat for the species. Glades were cleared in 1993, 1996 and 1998 by volunteers and FE. | | |

- 5.2 Site safeguard and management
 - 5.2.1 Where possible, ensure that all occupied and potential habitat is appropriately managed, including reduction of trampling by grazing animals between March and October by 1999, and rotational management of woodland margins by 2004. (ACTION: EN, FE)
 - 5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN)
- 5.3 Species management and protection
 - 5.3.1 Strengthen populations by using captive-bred stock if necessary, taking into account the long generation time. (ACTION EN)
 - 5.3.2 Consider (re)introducing the New Forest cicada to a series of sites within the former range, if necessary to establish two new viable populations by 2020. (ACTION: EN)
- 5.4 Advisory
 - 5.4.1 Ensure that all relevant managers and local staff in the New Forest are aware of the species and its conservation requirements. (ACTION: EN, FC)
- 5.5 Future research and monitoring
 - 5.5.1 Attempt to determine the current status by making annual searches for singing males and egg nests in suitable habitat areas in the New Forest, with special attention to the last two known sites and adjacent areas. (ACTION: EN)
 - 5.5.2 Monitor emergence turrets, singing males and egg nests on any extant site. (ACTION: EN)
 - 5.5.3 Encourage research on the ecology and conservation of this species at an international level, and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
 - 5.5.4 Test rearing methodology using stock from continental sites. This is a long-term project as the life cycle is 6-8 years underground. (ACTION: EN)
- 5.6 Communication and publicity
 - 5.6.1 Improve awareness of the song of the male cicada in the New Forest in order to increase the chances of finding small dispersed populations. (ACTION: EN)
 - 5.6.2 Promote opportunities for the appreciation of the species and conservation issues associated with its habitat. This should be achieved through articles within appropriate readership journals, as well as by a publicity leaflet. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This plan should be considered in conjunction with that for the lowland wood pastures and parklands.

Wart-biter (*Decticus verrucivorus*) (Order: Orthoptera) Action Plan

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| <p>1. Current status</p> <p>1.1 The wart-biter is a species of calcareous grassland, although one extant UK colony occupies a heathland/grassland site. The species requires a finely balanced habitat mosaic: bare ground/short turf, into which eggs are laid; grass tussocks, amongst which older nymphs and adults conceal themselves from predators; and a sward rich in flowering forbs and invertebrates, which provide nutrition. The species is thermophilous, and tends to occur on sites with a southerly aspect. Eggs are laid into the soil and persist underground over two winters, hatching in mid to late April. There are seven nymphal instars, and the adult stage is usually attained in July. Oviposition occurs from August until around early October, when the adults die off. Although regarded as the same species, the wart-biter appears to differ slightly in the UK from individuals found in continental populations.</p> <p>1.2 Records suggest that the species has been very localised in southern England since at least the early 1800s. Former records exist for Hampshire and the Isle of Wight, and a number of historic colonies have been lost from within the current range. There are currently five populations, two in East Sussex and one each in Dorset, Wiltshire and Kent (the latter arising from a recent reintroduction). Numbers of individuals vary considerably between years, but all extant populations are small. The largest is estimated to contain 2000 adults in peak years, but colonies often contain only 20-50 adults, or fewer in poor years. The species is widespread in central and southern Europe, but appears to be declining in parts of this range.</p> <p>1.3 In Great Britain this species is classified as Vulnerable. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.</p> | <p>3.2 A captive breeding programme for this species has been operating at the Invertebrate Conservation Centre, London Zoo (on behalf of EN), since 1993/94.</p> <p>3.3 The sites of the five current populations comprise two NNRs, two SSSIs and one County Trust Nature Reserve.</p> <p>3.4 A species action plan, commissioned by EN, was completed in 1997.</p> <p>4. Action plan objectives and targets</p> <p>4.1 Maintain populations at all known sites.</p> <p>4.2 Enhance the population size at all known sites by 2005.</p> <p>4.3 Restore populations of the wart-biter to at least three sites, and attain long-term viable populations at four sites, by 2005.</p> <p>4.4 Secure the future of the species in England by providing a minimum of 10 populations across its known range by 2010, provided that suitable habitat and (re)introduction stock are available.</p> <p>5. Proposed action with lead agencies</p> <p>Action to monitor extant populations and habitat conditions at occupied sites, and to ensure that appropriate site management systems are applied, is required. This should be combined with a continuing programme of surveys to identify and monitor potential sites for (re)introductions, and support for the captive breeding of this species.</p> <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)</p> <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that all occupied and nearby potential habitat is appropriately managed by 2005, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF)</p> <p>5.2.2 Ensure that the habitat requirements of the wart-biter are taken into account in any relevant development policies, plans and proposals. (ACTION: EN, LAs)</p> <p>5.2.3 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN).</p> <p>5.2.4 Consider notifying as SSSI sites holding key populations of this species, where this is necessary to secure their long-</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Inappropriate grassland management, leading to loss of habitat quality and small population sizes, is the major threat to this species.</p> <p>2.2 Predation, particularly by birds, is a significant problem at some sites.</p> | |
| <p>3. Current action</p> <p>3.1 A programme of research on this species and its habitat requirements, on behalf of EN, has been in operation since 1987. This has involved surveys of historical, extant and potential (re)introduction sites, population monitoring, formulation of habitat management recommendations and a (re)introduction programme.</p> | |

term protection and appropriate management.
(ACTION: EN).

5.3 Species management and protection

5.3.1 Monitor, and take relevant action against, competitive and predatory species. (ACTION: EN).

5.3.2 (Re)introduce the wart-biter to sites within the former range of the species, where appropriate habitat and site management are available, in order to restore three populations by 2005, and ensure that there are a minimum of 10 populations by 2010. (ACTION: EN).

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)

5.5 Future research and monitoring

5.5.1 Conduct targeted autecological research to inform habitat management. (ACTION: EN)

5.5.2 Support the continued development of a captive breeding and (re)introduction programme. (ACTION: EN)

5.5.3 Continue to monitor populations and habitat conditions at occupied sites. (ACTION: EN)

5.5.4 Continue a programme of surveys to identify potential sites for (re)introductions. (ACTION: EN)

5.5.5 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN).

5.6 Communication and publicity

5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with that for lowland calcareous grassland.

Field-cricket (*Gryllus campestris*)

(Order: Orthoptera)

Action Plan

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| <p>1. Current status</p> <p>1.1 The field-cricket is a flightless insect of short, warm, tussocky grasslands which have between 10 and 50% bare ground. Oviposition and early nymphal stages are associated with patches of bare ground. Later development and overwintering occurs within grass tussocks, at the base of which the field-cricket constructs its burrows. As such, it is a species of early- to mid-successional grassland rather than established meadows. This successional component may be naturally extended on steep, south-facing banks. The species' reproductive success is naturally sporadic, with occasional large population increases interspersed with periods of several years when the population naturally decreases. One factor driving this pattern is the weather conditions over each yearly reproductive cycle; another factor is the availability of suitable sunny, bare ground for oviposition.</p> <p>1.2 The field-cricket is an extremely rare, declining and vulnerable insect which, in the UK, is restricted to one natural population, consisting of three sub-populations, within one square kilometre in West Sussex. Two reintroduced populations have been established, both of which are also in West Sussex. Other reintroductions within its confirmed natural range are planned. This species has always had a very restricted range in England, being bounded (approximately) to the east by the River Arun, to the west by the Solent, to the north by the North Downs and to the south by the Isle of Wight. The majority of records are from sandstone areas, although there are a few from the chalk. Records from outside this area either refer to accidental imports from the Continent or, more often, to misidentifications of the call of the house cricket, <i>Acheta domestica</i>. The field cricket is widespread in southern and central Europe, north to the Netherlands and Germany, although it is in severe decline throughout much of its range. Towards the southern edge of its range it becomes a montane species, being replaced at lower latitudes by <i>Gryllus bimaculatus</i>.</p> <p>1.3 In Great Britain this species is classified as Endangered. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.</p> | <p>3.1 This species has been part of the EN's Species Recovery Programme since 1991. Under this programme, a species action plan was written in 1995 and has been revised annually since then.</p> <p>3.2 The last fully native population is, in part, on an SSSI. Both reintroductions are on SSSIs.</p> <p>4. Action plan objectives and targets</p> <p>4.1 Maintain populations at all known sites.</p> <p>4.2 Enhance the population size at all known sites by 2010.</p> <p>4.3 Restore populations to further suitable sites within the historic range to achieve a total of ten viable populations by 2010.</p> <p>4.4 Maintain an ex situ programme to provide material for reintroductions and ecological research.</p> <p>5. Proposed action with lead agencies</p> <p>This action plan builds on the ongoing work for the species under the Species Recovery Programme. The priority is the maintenance of early- to mid-successional grassland habitats in full exposure to the sun on all actual or potential sites. Captive breeding will be necessary to provide material for reintroductions to ensure 10 viable populations are established by 2010.</p> <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes (ACTION: EN, MAFF)</p> <p>5.2 Site safeguard and management</p> <p>5.2.1 Where possible, ensure that all occupied and nearby potential grassland habitat is appropriately managed by 2008. This should be achieved through a rotational programme of ground disturbance, and subsequent appropriate grazing or mechanical management. (ACTION: EN, MAFF)</p> <p>5.2.2 Ensure that the habitat requirements of the field-cricket are taken into account in relevant development policies, plans and proposals. (ACTION: EN, LAs)</p> <p>5.2.3 Consider notifying sites supporting viable populations of field-crickets as SSSIs where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN)</p> <p>5.3 Species management and protection</p> |
| <p>2. Current factors causing loss or decline</p> <p>2.1 Inappropriate site management reducing the availability of bare ground areas.</p> <p>2.2 Unfavourably warm winters followed by wet spring weather. This is a possible scenario under global warming.</p> <p>2.3 Invasion of acidic grasslands by bracken.</p> | |
| <p>3. Current action</p> | |

- 5.3.1 Maintain and, if necessary, expand the existing captive rearing and release programme until the English populations are considered beyond threat. (ACTION: EN)
- 5.3.2 Re-introduce the field-cricket to a series of sites to achieve a total of 10 viable populations. (ACTION: EN)
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
- 5.5 Future research and monitoring
 - 5.5.1 Conduct further targeted autecological research to inform habitat management. (ACTION: EN)
 - 5.5.2 Establish a regular monitoring programme. (ACTION: EN)
 - 5.5.3 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (ACTION: EN)
 - 5.5.4 Encourage research on the ecology and conservation of this species on an international level and use the experience gained towards its conservation in the UK. (ACTION: EN, JNCC)
- 5.6 Communications and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by publicity leaflets. (ACTION: EN)
- 5.7 Links with other action plans
 - 5.7.1 This action plan should be considered in conjunction with that for lowland dry acid grassland.

Large marsh grasshopper (*Stethophyma grossum*)

(Order: Orthoptera)

Action Plan

- | | |
|--|---|
| <p>1. Current status</p> <p>1.1 The large marsh grasshopper is the UK's largest grasshopper. It is restricted to very wet, marshy areas, commonly quaking acidic bogs, although historically the species also occupied fenland and riverside habitats. The detailed ecology of the species is poorly known. It appears that eggs (in batches of 10-14, in elongated pods) are laid at the bases of grass stems. Four nymphal instars are reported, with the first emerging in May/June; the adult stage is attained by mid July and adults may survive into November in favourable conditions.</p> <p>1.2 The UK range of the large marsh grasshopper formerly included the Thames Valley (to the mid 19th century) and East Anglia (to the late 1960s). The species has declined severely in the Somerset Levels since around 1960, and its current status in this area is unclear; the last confirmed records are from 1989 at one site and 1995 at a second. Two small, isolated colonies in Surrey (at least one of which arose from an introduction in the late 1960s) have not been confirmed since 1991. There are currently a number of populations in Dorset and the New Forest, but little information on their size is available other than to suggest that most are small. The species is present throughout Europe (except in the extreme south), extending eastwards into the former Soviet Union, but it is vulnerable to habitat loss throughout its range. UK populations represent some of the most northerly colonies of the species.</p> <p>1.3 In Great Britain this species is classified as Vulnerable.</p> | <p>3.3 Most known extant populations of the large marsh grasshopper occur in SSSIs and/or NNRs.</p> <p>3.4 Bristol Zoo is currently investigating a captive breeding strategy for this species.</p> <p>3.5 A species action plan, commissioned by EN, was written in 1997.</p> |
| <p>2. Current factors causing loss or decline</p> | |
| <p>2.1 Drainage of wetlands for land reclamation and peat extraction has had a major impact on the large marsh grasshopper.</p> <p>2.2 Land use on areas adjacent to occupied sites may also affect this species through pollution and impact on local water tables.</p> <p>2.3 Climate change may adversely affect this species, through the drying-out of suitable habitat.</p> | <p>4. Action plan objectives and targets</p> <p>4.1 Prevent further contraction in range, and decline in population sizes, at known sites.</p> <p>4.2 Restore populations to five suitable sites within the historic range of the species by 2010.</p> |
| <p>3. Current action</p> | |
| <p>3.1 Clarification of the current range and status of this species in the UK was the subject of a project under the EN Species Recovery Programme in 1997.</p> <p>3.2 Recent surveys by the Dorset Environmental Records Centre have contributed to the assessment of the species' status in this county.</p> | <p>5. Proposed action with lead agencies</p> <p>A comprehensive site survey and programme of autecological research will provide baseline information and allow recommendations for appropriate management of wetland habitat for the large marsh grasshopper to be developed. Application of appropriate management should allow further decline of the species to be arrested and, in combination with a survey of potential (re)introduction sites and a captive breeding programme, will provide a basis for increasing the number of colonies in the UK.</p> <p>5.1 Policy and legislation</p> <p>5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (ACTION: EN, MAFF)</p> <p>5.1.2 Address the requirements of this species in the LEAP process and in relevant WLMPs. (ACTION: EA, IDBs, LAs, MAFF)</p> <p>5.1.3 Take account of the species' requirements in response to applications for water abstraction licences. (ACTION: EA)</p> <p>5.2 Site management and protection</p> <p>5.2.1 Where possible, ensure that all occupied and potential habitat is appropriately managed by 2010, for example through SSSI or agri-environment scheme management agreements. (ACTION: EN, MAFF)</p> <p>5.2.2 Ensure that the habitat requirements of the large marsh grasshopper are taken into account in any relevant development policies, plans and proposals. (ACTION: EN, LAs)</p> |

- 5.2.3 Ensure that the species is included in site management documents for all relevant SSSIs. (ACTION: EN)
- 5.2.4 Consider notifying as SSSI sites holding key populations of this species, where this is necessary to secure their long-term protection and appropriate management. (ACTION: EN).
- 5.3 Species management and protection
 - 5.3.1 (Re)introduce the large marsh grasshopper to sites within the former range of the species, where appropriate habitat and site management are available, in order to restore populations to five sites. (ACTION: EN).
- 5.4 Advisory
 - 5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (ACTION: EN)
- 5.5 Future research and monitoring
 - 5.5.1 Undertake further surveys to determine the status of this species and to identify potential sites for (re)introductions. (ACTION: EN)
 - 5.5.2 Conduct targeted autecological research to inform habitat management. (ACTION: EN)
 - 5.5.3 Establish a regular monitoring programme for this species. (ACTION: EN)
 - 5.5.4 Support the development of a captive breeding strategy as a component of any (re)introduction programme. (ACTION: EN)
 - 5.5.5 Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: EN)
- 5.6 Communication and publicity
 - 5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (ACTION: EN).
- 5.7 Links with other action plans
 - 5.7.1 Implementation of this action plan could benefit other species of lowland mire, including the ground beetle *Pterostichus aterrimus*.
 - 5.7.2 This plan should be considered in conjunction with that for fens.

Clubiona subsultans (a spider)
(Order: Araneae)
Species Statement

1. Current status

- 1.1 Clubiona subsultans is not infrequent in semi-natural pine forests in a few areas of Scotland. It has been found in a range of situations: under bark and stones, in pine litter, amongst moss, on branches, amongst young pines, and in juniper bushes under pines. Adult spiders are present in the summer, with males being recorded as late as September.
- 1.2 Clubiona subsultans was recorded from Abernethy Forest several times between 1945 and 1993. It was also found near Coylumbridge in 1979 and there are sporadic records from the Black Wood of Rannoch between 1913 and 1987. It is thought to be fairly plentiful in Abernethy Forest, but more sparse in the Black Wood of Rannoch. The species is widespread in Scandinavia, central Europe and Russia.
- 1.3 In Great Britain this species is classified as Vulnerable.

2. Current factors causing loss or decline

- 2.1 Changes in the extent, density and management of native pine woodland may affect this spider.
- 2.2 Pinewood regeneration should have a beneficial effect by creating new areas of habitat. However, areas of dense regeneration may be as unsuitable as plantation woodland for this species.

3. Current action

- 3.1 The spider is present in SSSIs and NNRs. It is also in RSPB and FC nature reserves, including the Abernethy Forest Reserve.

4. Objective for the species

- 4.1 Maintain known populations of Clubiona subsultans.

5. Proposed action

- 5.1 Monitoring only. This species could benefit from the action plans for other species of Scottish pine woods, including the Scottish wood ant Formica aquilonia and twinflower Linnaea borealis. The requirements of the species should be taken into account in the implementation of the action plan for native pine woodland.

Uloborus walckenaerius (a spider)
(Order: Araneae)
Species Statement

1. Current status

1.1 *Uloborus walckenaerius* inhabits lowland heathland where it spins an almost horizontal orb web about midway between the ground and the top of mature heather plants. Both sexes are adult in June, adult females also occur in July and occasionally in August.

1.2 This spider has been found in large numbers on heathland at a few sites in the south of England: the New Forest (south Hampshire), Chobham Common (Surrey), and Thursley Common (Surrey). It has also been recorded from Crookham Common (north Hampshire), Ambersham Common (West Sussex), Ash Ranges (Surrey), Bloxworth (Surrey) and Wokingham (Berkshire). It has disappeared from several of its former strongholds and is declining as the area of heathland declines, but this has not been quantified. In the UK it is confined to the southern counties of England, but it has a palaeartic distribution and is widespread in central and southern Europe. A related species, *Uloborus plumipes*, has established itself in glasshouses in England.

1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

2.1 Loss of heathland due to development and afforestation.

2.2 Inappropriate heathland management.

3. Current action

3.1 A number of the known sites for this species are SSSIs or NNRs.

4. Objective for the species

4.1 Maintain known populations of *Uloborus walckenaerius*.

5. Proposed action

5.7.1 Monitoring only. It is likely that this species will benefit from the action plans for other species of lowland heathland, including *Amara foveolata*, *Cicindela sylvatica* and *Pterostichus kugelanni*. The requirements of the species should be taken into account in the implementation of the action plan for lowland heathland.

Lesser water measurer (*Hydrometra gracilentata*)
(Order: Hemiptera)
Species Statement

1. Current status

1.1 Little is known of the biology of the lesser water measurer, but it is probably a predator and scavenger. The habitat of the species appears to be the surface of small water bodies such as dykes or shallow pools with overhanging vegetation. The water bodies are usually situated in mature fen vegetation, although on the Pevensey Levels, East Sussex, the lesser water measurer occurs on a grazing marsh dyke with emergent vegetation. The bug may leave the water at certain times of year and take up residence in nearby vegetation.

1.2 This semi-aquatic bug is locally widespread in northern and central Europe, east to Asian Russia. In Britain the species is known from the Ant Valley in the Norfolk Broads, the Pevensey Levels and the New Forest. The species has been recorded only once in the Pevensey Levels and once in the New Forest. The Pevensey Levels record is recent (1988) while the New Forest record lacks details and is pre 1960. In the Ant Valley it was first recorded in 1938 at Barton Broad, and was recorded irregularly at Barton and Sutton Broads during the 1950s. The only record since then was at Reedham Marsh in 1989. It is possible that the species occurs, undiscovered, elsewhere.

1.3 In Great Britain this species is classified as Rare.

2. Current factors causing loss or decline

2.1 Not known.

3. Current action

3.1 All known sites are within SSSIs. All Norfolk sites are in the Ant NNR.

4. Objective for the species

4.1 Maintain existing populations of the lesser water measurer.

5. Proposed action

5.1 Monitoring only. This species could benefit from the action plans for other species of lowland fens and grazing marshes, including: *Dolomedes plantarius*, *Segmentina nitida*, *Anisus vorticulus*, *Najas marina* and *Potamogeton compressus*. The requirements of the species should be taken into account in the delivery of the action plans for fens, and coastal and floodplain grazing marshes.

Prostoma jenningsi (a freshwater nemertean)
(Order: Nemertea)
Species Statement

1. Current status

1.1 This is a small, inconspicuous freshwater species which can only be distinguished from other freshwater nemerteans of the genus by means of detailed histological studies of its internal morphology.

1.2 So far, this species is known from only one locality in the world, a pond at Croston, Lancashire where it was discovered in 1971. At the time of its discovery more than 200 ponds in the Lancashire, Merseyside and Wirral region had been investigated for their freshwater fauna, but no other sites yielded specimens of *Prostoma jenningsi*. The species has not been recorded since 1978, although there have been no specific surveys for this species since 1980, and it is very unlikely that it would be recorded in general aquatic invertebrate surveys.

1.3 In Great Britain this species is classified as Insufficiently Known.

2. Current factors causing loss or decline

2.1 The pond at Croston was contaminated by spillage of agricultural fertiliser around 1978 and the species has not been found since.

3. Current action

3.1 None known.

4. Objective for the species

4.1 Maintain any discovered populations.

5. Proposed action

5.1 Search only.

Annex 1. List of abbreviations and acronyms

ASSI	Area of Special Scientific Interest (Northern Ireland)
CC	County Council
CCW	Countryside Council for Wales
DANI	Department of Agriculture for Northern Ireland
DETR	Department of the Environment, Transport and the Regions
EA	Environment Agency
EC	European Community
EH	English Heritage
EHS	Environment and Heritage Service (Northern Ireland)
EN	English Nature
ESA	Environmentally Sensitive Area
FC	Forestry Commission
FE	Forest Enterprise
GCT	Game Conservancy Trust
HA	Highways Agency
IDB	Internal Drainage Board
IUCN International Union for the Conservation of Nature
JNCC	Joint Nature Conservation Committee
LA	Local Authority
LEC	Local Enterprise Company
MAFF	Ministry of Agriculture, Fisheries and Food
MoD	Ministry of Defence
NAW	National Assembly for Wales
NGO	Non-governmental organisation
NNR	National Nature Reserve
NTS	National Trust for Scotland
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SE	Scottish Executive
SEPA	Scottish Environmental Protection Agency
SNH	Scottish Natural Heritage
SOAEFD	Scottish Office Agriculture, Environment and Fisheries Department
SPA	Special Protection Area
SSC	Species Survival Commission (IUCN)
SSSI	Site of Special Scientific Interest (Britain)
SWAs	Scottish Water Authorities
WGS	Woodland Grant Scheme
WOAD	Welsh Office Agriculture Department

Annex 2. Action plan costings

Summary table showing estimated additional costs in £K per year for the first and second five years of each Species Action Plan.

		1st five years	2nd five years
Coleoptera			
<i>Agabus brunneus</i>	a diving beetle	16.4	13.1
<i>Amara famelica</i>	a ground beetle	10.3	9.4
<i>Anisodactylus poeciloides</i>	a ground beetle	12.6	12.2
<i>Anostirus castaneus</i>	a click beetle	16.6	13.1
<i>Bidessus unistriatus</i>	a diving beetle	14.3	6.0
<i>Byctiscus populi</i>	a leaf-rolling weevil	27.5	22.8
<i>Cicindela germanica</i>	a tiger beetle	16.1	13.0
<i>Cicindela hybrida</i>	a tiger beetle	13.2	12.8
<i>Cicindela sylvatica</i>	heath tiger beetle	16.6	13.5
<i>Cryptocephalus nitidulus</i>	a leaf beetle	13.2	11.2
<i>Cryptocephalus primarius</i>	a leaf beetle	10.7	7.5
<i>Cryptocephalus sexpunctatus</i>	a leaf beetle	13.8	12.3
<i>Curimopsis nigrata</i>	mire pill-beetle	12.7	8.1
<i>Donacia aquatica</i>	a reed beetle	14.3	12.8
<i>Donacia bicolora</i>	a reed beetle	17.4	11.3
<i>Ernoporus tiliae</i>	a bark beetle	13.0	3.8
<i>Graphoderus zonatus</i>	spangled diving beetle	11.1	3.2
<i>Helophorus laticollis</i>	a water beetle	12.6	11.7
<i>Hydrochara caraboides</i>	lesser silver water beetle	13.1	5.8
<i>Hydroporus rufifrons</i>	a diving beetle	16.7	9.4
<i>Laccophilus poecilus</i>	a diving beetle	8.0	5.6
<i>Malachius aeneus</i>	a false soldier beetle	15.8	11.8
<i>Melanapion minimum</i>	a weevil	10.7	11.9
<i>Melanotus punctolineatus</i>	a click beetle	8.7	6.4
<i>Pachytychius haematocephalus</i>	a weevil	12.1	6.4
<i>Paracymus aeneus</i>	a water beetle	11.5	6.6
<i>Procas granulicollis</i>	a weevil	24.5	10.2
<i>Psylliodes sophiae</i>	a flea beetle	10.2	9.3

<i>Pterostichus aterrimus</i>	a ground beetle	20.3	13.3
<i>Pterostichus kugelanni</i>	a ground beetle	12.2	8.4
<i>Rhynchaenus testaceus</i>	a jumping weevil	9.0	8.7
		1st five years	2nd five years
Diptera			
<i>Blera fallax</i>	a hoverfly	5.9	4.8
<i>Bombylius discolor</i>	dotted bee-fly	21.6	17.4
<i>Bombylius minor</i>	heath bee-fly	14.1	6.0
<i>Clorismia rustica</i>	a stiletto-fly	27.2	15.2
<i>Doros profuges</i>	a hoverfly	15.9	6.8
<i>Dorycera graminum</i>	a picture-winged fly	18.0	8.8
<i>Eristalis cryptarum</i>	a hoverfly	16.8	15.2
<i>Hammerschmidia ferruginea</i>	a hoverfly	14.3	18.7
<i>Lipsothrix ecucullata</i>	a crane-fly	17.4	7.3
<i>Lipsothrix nervosa</i>	a crane-fly	12.8	7.3
<i>Lipsothrix nigristigma</i>	a crane-fly	17.1	18.1
<i>Thyridanthrax fenestratus</i>	mottled bee-fly	23.8	14.8
Hymenoptera			
<i>Andrena ferox</i>	a mining bee	17.1	19.5
<i>Andrena gravida</i>	banded mining bee	20.3	22.2
<i>Andrena lathyri</i>	a mining bee	11.4	3.9
<i>Bombus distinguendus</i>	great yellow bumblebee	18.4	8.8
<i>Bombus humilis</i>	a carder bumblebee	23.8	14.7
<i>Bombus ruderatus</i>	large garden bumblebee	15.4	17.6
<i>Bombus subterraneus</i>	short-haired bumblebee	15.4	17.3
<i>Cerceris quadricincta</i>	a solitary wasp	17.6	19.5
<i>Cerceris quinquefasciata</i>	a solitary wasp	21.7	22.5
<i>Chrysis fulgida</i>	a ruby-tailed wasp	12.5	3.3
<i>Colletes floralis</i>	the northern colletes	12.0	6.5
<i>Formica aquilonia</i>	Scottish wood ant	6.4	2.4
<i>Formica rufibarbis</i>	red-barbed ant	11.1	10.7
<i>Homonotus sanguinolentus</i>	a spider-hunting wasp	10.0	17.3
<i>Nomada armata</i>	a cuckoo bee	13.3	12.3
<i>Nomada errans</i>	a cuckoo bee	12.0	7.7
<i>Osmia inermis</i>	a mason bee	17.7	9.6

<i>Osmia parietina</i>	a mason bee	22.6	23.2
<i>Osmia uncinata</i>	a mason bee	17.4	9.1
<i>Osmia xanthomelana</i>	a mason bee	17.7	8.2
<i>Pseudepipona herrichii</i>	Purbeck mason wasp	11.4	1.9
Lepidoptera			
<i>Acosmetia caliginosa</i>	reddish buff	12.6	24.3
<i>Aspitates gilvaria</i>	straw belle	12.2	12.3
		1st five years	2nd five years
<i>Athetis pallustris</i>	marsh moth	7.9	6.1
<i>Bembecia chrysidiformis</i>	fiery clearwing	17.5	9.4
<i>Carterocephalus palaemon</i>	chequered skipper	23.8	23.9
<i>Catocala promissa</i>	light crimson underwing	12.9	9.4
<i>Catocala sponsa</i>	dark crimson underwing	12.5	7.1
<i>Coleophora tricolor</i>	basil thyme case-bearer	12.0	18.2
<i>Cosmia diffinis</i>	white-spotted pinion	13.8	10.3
<i>Cucullia lychnitis</i>	striped lychnis	26.1	21.0
<i>Cyclophora pendularia</i>	dingy mocha	16.1	15.7
<i>Dicycla oo</i>	heart moth	12.0	3.9
<i>Epione parallelaria</i>	dark-bordered beauty	14.3	19.0
<i>Heliophobus reticulata marginosa</i>	bordered gothic	15.5	15.1
<i>Hemaris tityus</i>	narrow-bordered bee hawk-moth	16.1	22.2
<i>Hypena rostralis</i>	buttoned snout	22.9	20.1
<i>Idaea dilutaria</i>	silky wave	11.5	8.6
<i>Jodia croceago</i>	orange upperwing	11.3	25.2
<i>Lysandra bellargus</i>	Adonis blue	30.5	21.3
<i>Mythimna turca</i>	double line	17.3	15.9
<i>Oria musculosa</i>	Brighton wainscot	16.3	7.2
<i>Pareulype berberata</i>	barberry carpet	18.5	25.8
<i>Pechipogo strigilata</i>	common fan-foot	14.0	15.2
<i>Plebejus argus</i>	silver-studded blue	39.5	27.7
<i>Polia bombycina</i>	pale shining brown	16.1	7.0
<i>Semiothisa carbonaria</i>	netted mountain moth	24.2	15.0
<i>Siona lineata</i>	black-veined moth	12.3	20.1
<i>Tyta luctuosa</i>	four-spotted moth	17.0	20.5
<i>Xylena exsoleta</i>	sword-grass	20.5	11.3
<i>Zygaena loti scotica</i>	slender Scotch burnet	18.8	11.3

<i>Zygaena viciae argyllensis</i>	New Forest burnet	12.5	5.0
Other Invertebrates			
<i>Clubiona rosserae</i>	a spider	8.6	1.3
<i>Dolomedes plantarius</i>	fen raft spider	11.8	5.3
<i>Eresus sandaliatus</i>	ladybird spider	14.5	2.5
<i>Lophopus crystallinus</i>	a freshwater bryozoan	23.8	8.3
<i>Cicadetta montana</i>	New Forest cicada	12.0	10.9
<i>Decticus verrucivorus</i>	wart-biter	15.0	17.9
<i>Gryllus campestris</i>	field cricket	16.4	26.6
		1st five years	2nd five years
<i>Stethophyma grossum</i>	large marsh grasshopper	23.5	14.7
Annual total (£K)		1631.0	1283.4
Total five yeat cost (£K)		8154.8	6417.0

Costs excludes 10% administration, and the contribution of agri-environment schemes which is being estimated separately.

Annex 3. List of species, with Contact Points and Lead Partners

Table 1, below, lists the Contact Points and Lead Partners for the species action plans published in this volume. Lead Partners for 15 species are still to be determined at the time of going to press. In order to benefit from the geographical/habitat/taxonomic associations of some of the species, a number have been placed in small groups to each of which a contact point and lead partner/joint lead partners have been assigned. These groups are listed in Table 2. A list of Species Statements included in this volume is given in Table 3.

Table 1: Species Action Plans

Species	Contact Point	Lead Partner	Group
Coleoptera			
Agabus brunneus a diving beetle	Balfour Browne Club	Balfour Browne Club	-
Amara famelica a ground beetle	English Nature	to be determined	-
Anisodactylus poeciloides a ground beetle	Environment Agency	to be determined	-
Anostirus castaneus a click beetle	English Nature	to be determined	-
Bidessus unistriatus a diving beetle	English Nature	Balfour Browne Club	-
Byctiscus populi a leaf-rolling weevil	English Nature	to be determined	-
Cicindela germanica a tiger beetle	English Nature	English Nature	16
Cicindela hybrida a tiger beetle	English Nature	English Nature	16
Cicindela sylvatica heath tiger beetle	English Nature	English Nature	16

Species	Contact Point	Lead Partner	Group
<i>Cryptocephalus nitidulus</i> a leaf beetle	English Nature	Leeds University	15
<i>Cryptocephalus primarius</i> a leaf beetle	English Nature	Leeds University	15
<i>Cryptocephalus sexpunctatus</i> a leaf beetle	English Nature	Leeds University	15
<i>Curimopsis nigrita</i> mire pill-beetle	English Nature	The Wildlife Trusts	-
<i>Donacia aquatica</i> a reed beetle	English Nature	Balfour Browne Club	4
<i>Donacia bicolora</i> a reed beetle	English Nature	Balfour Browne Club	4
<i>Ernoporus tiliae</i> a bark beetle	English Nature	Forest Enterprise	-
<i>Graphoderus zonatus</i> spangled diving beetle	English Nature	English Nature	-
<i>Helophorus laticollis</i> a water beetle	English Nature	Forest Enterprise - New Forset Group	14
<i>Hydrochara caraboides</i> lesser silver water beetle	English Nature	Balfour Browne Club	-
<i>Hydroporus rufifrons</i> a diving beetle	English Nature	Balfour Browne Club	-
<i>Laccophilus poecilus</i> a diving beetle	English Nature	to be determined	-
<i>Malachius aeneus</i> a false soldier beetle	English Nature	English Nature	-
<i>Melanapion minimum</i> a weevil	English Nature	to be determined	-
<i>Melanotus punctolineatus</i> a click beetle	English Nature	to be determined	-
<i>Pachytychius haematocephalus</i> a weevil	English Nature	to be determined	-
<i>Paracymus aeneus</i> a water beetle	English Nature	English Nature	-
<i>Procas granulicollis</i> a weevil	Countryside Council for Wales	Countryside Council for Wales	-
<i>Psylliodes sophiae</i> a flea beetle	English Nature	The Wildlife Trusts	-
<i>Pterostichus aterrimus</i> a ground beetle (N.I.)	Environment and Heritage Service	Environment and Heritage Service	-
<i>Pterostichus aterrimus</i> a ground beetle (England)	English Nature	Forest Enterprise - New Forest Group	14

Species	Contact Point	Lead Partner	Group
<i>Pterostichus kugelanni</i> a ground beetle	English Nature	Forest Enterprise - New Forest Group	14
<i>Rhynchaenus testaceus</i> a jumping weevil	English Nature	to be determined	-
Diptera			
<i>Blera fallax</i> a hoverfly	Scottish Natural Heritage	Royal Society for the Protection of Birds	10
<i>Bombylius discolor</i> dotted bee-fly	English Nature	English Nature	-
<i>Bombylius minor</i> heath bee-fly	English Nature	The British Entomological and Natural History Society	3
<i>Clorismia rustica</i> a stiletto-fly	Environment Agency	Environment Agency - Exposed River Sediments Group	-
<i>Doros profuges</i> a hoverfly	English Nature	English Nature	-
<i>Dorycera graminum</i> a picture-winged fly	English Nature	English Nature	-
<i>Eristalis cryptarum</i> a hoverfly	English Nature	Dartmoor National Park Authority/ English Nature	-
<i>Hammerschmidtia ferruginea</i> a hoverfly	Scottish Natural Heritage	Royal Society for the Protection of Birds	10
<i>Lipsothrix ecucullata</i> a cranefly	English Nature	Scottish Natural Heritage	11
<i>Lipsothrix nervosa</i> a cranefly	English Nature	Countryside Council for Wales	11
<i>Lipsothrix nigristigma</i> a cranefly	English Nature	English Nature	11
<i>Thyridanthrax fenestratus</i> mottled bee-fly	English Nature	The British Entomological and Natural History Society	3
Hymenoptera			
<i>Andrena ferox</i> a mining bee	English Nature	English Nature/Aculeate Conservation Working Group	6
<i>Andrena gravida</i> banded mining bee	English Nature	English Nature/Aculeate Conservation Working Group	6
<i>Andrena lathyri</i> a mining bee	English Nature	English Nature/Aculeate Conservation Working Group	-
<i>Bombus distinguendus</i> great yellow bumblebee	Scottish Natural Heritage	Royal Society for the Protection of Birds/Bombus Working Group	5
<i>Bombus humilis</i> a carder bumblebee	English Nature	English Nature/Bombus Working Group	7

Species	Contact Point	Lead Partner	Group
<i>Bombus ruderatus</i> large garden bumblebee	English Nature	English Nature/Bombus Working Group	7
<i>Bombus subterraneus</i> short-haired bumblebee	English Nature	English Nature/Bombus Working Group	7
<i>Cerceris quadricincta</i> a solitary wasp	English Nature	English Nature/Aculeate Conservation Working Group	6
<i>Cerceris quinquefasciata</i> a solitary wasp	English Nature	English Nature/Aculeate Conservation Working Group	6
<i>Chrysis fulgida</i> a ruby-tailed wasp	English Nature	English Nature/Aculeate Conservation Working Group	2
<i>Colletes floralis</i> the northern colletes	Scottish Natural Heritage	Royal Society for the Protection of Birds/Bombus Working Group	5
<i>Formica aquilonia</i> Scottish wood ant	Scottish Natural Heritage	Forestry Commission	-
<i>Formica rufibarbis</i> red-barbed ant	English Nature	English Nature/Aculeate Conservation Working Group	2
<i>Homonotus sanguinolentus</i> a spider-hunting wasp	English Nature	English Nature/Aculeate Conservation Working Group	2
<i>Nomada armata</i> a cuckoo bee	English Nature	English Nature/Aculeate Conservation Working Group	6
<i>Nomada errans</i> a cuckoo bee	English Nature	English Nature/Aculeate Conservation Working Group	-
<i>Osmia inermis</i> a mason bee	Scottish Natural Heritage	Scottish Natural Heritage/Aculeate Conservation Working Group	-
<i>Osmia parietina</i> a mason bee	English Nature	English Nature/Aculeate Conservation Working Group	-
<i>Osmia uncinata</i> a mason bee	Scottish Natural Heritage	Royal Society for the Protection of Birds	-
<i>Osmia xanthomelana</i> a mason bee	Countryside Council for Wales	Countryside Council for Wales/Aculeate Conservation Working Group	-
<i>Pseudepipona herrichii</i> Purbeck mason wasp	English Nature	English Nature/Aculeate Conservation Working Group	2
Lepidoptera			
<i>Acosmetia caliginosa</i> reddish buff	English Nature	Butterfly Conservation	1
<i>Aspitates gilvaria</i> straw belle	English Nature	Butterfly Conservation	8
<i>Athetis pallustris</i> marsh moth	English Nature	Butterfly Conservation	-
<i>Bembecia chrysidiformis</i> fiery clearwing	English Nature	Butterfly Conservation/ English Nature	-

Species	Contact Point	Lead Partner	Group
<i>Carterocephalus palaemon</i> chequered skipper	Scottish Natural Heritage	Butterfly Conservation	-
<i>Catocala promissa</i> light crimson underwing	English Nature	Butterfly Conservation	13
<i>Catocala sponsa</i> dark crimson underwing	English Nature	Butterfly Conservation	13
<i>Coleophora tricolor</i> basil thyme case-bearer	English Nature	Butterfly Conservation	-
<i>Cosmia diffinis</i> white-spotted pinion	English Nature	Butterfly Conservation	-
<i>Cucullia lychnitis</i> striped lychnis	English Nature	Butterfly Conservation	8
<i>Cyclophora pendularia</i> dingy mocha	English Nature	Butterfly Conservation	1
<i>Dicycla oo</i> heart moth	English Nature	Butterfly Conservation	12
<i>Epione parallelaria</i> dark-bordered beauty	Scottish Natural Heritage	Butterfly Conservation/Royal Society for the Protection of Birds	-
<i>Heliophobus reticulata</i> marginosa bordered gothic	English Nature	Butterfly Conservation	8
<i>Hemaris tityus</i> narrow-bordered bee hawk-moth	Countryside Council for Wales	Butterfly Conservation	9
<i>Hypena rostralis</i> buttoned snout	English Nature	Butterfly Conservation	-
<i>Idaea dilutaria</i> silky wave	Countryside Council for Wales	Butterfly Conservation	-
<i>Jodia croceago</i> orange upperwing	English Nature	Butterfly Conservation	12
<i>Lysandra bellargus</i> Adonis blue	English Nature	Butterfly Conservation	-
<i>Mythimna turca</i> double line	Countryside Council for Wales	Butterfly Conservation	9
<i>Oria muscosa</i> Brighton wainscot	English Nature	Butterfly Conservation	-
<i>Pareulype berberata</i> barberry carpet	English Nature	Butterfly Conservation	-
<i>Pechipogo strigilata</i> common fan-foot	English Nature	Butterfly Conservation	12
<i>Plebejus argus</i> silver-studded blue	English Nature	Butterfly Conservation	-

Species	Contact Point	Lead Partner	Group
<i>Polia bombycina</i> pale shining brown	English Nature	Butterfly Conservation	8
<i>Semiothisa carbonaria</i> netted mountain moth	Scottish Natural Heritage	Butterfly Conservation	-
<i>Siona lineata</i> black-veined moth	English Nature	Butterfly Conservation	8
<i>Tyta luctuosa</i> four-spotted moth	English Nature	Butterfly Conservation	8
<i>Xylena exsoleta</i> sword-grass	Scottish Natural Heritage	Butterfly Conservation	-
<i>Zygaena loti scotica</i> slender Scotch burnet	Scottish Natural Heritage	Butterfly Conservation	18
<i>Zygaena viciae argyllensis</i> New Forest burnet	Scottish Natural Heritage	Scottish Natural Heritage	18
Other Invertebrates			
<i>Clubiona rosserae</i> a spider	English Nature	English Nature	-
<i>Dolomedes plantarius</i> fen raft spider	English Nature	English Nature	-
<i>Eresus sandaliatus</i> ladybird spider	English Nature	English Nature	-
<i>Lophopus crystallinus</i> a freshwater bryozoan	Environment Agency	to be determined	-
<i>Cicadetta montana</i> New Forest cicada	English Nature	Forest Enterprise - New Forest Group	14
<i>Decticus verrucivorus</i> wart-biter	English Nature	CABI Bioscience	17
<i>Gryllus campestris</i> field cricket	English Nature	The Natural History Museum/English Nature	-
<i>Stethophyma grossum</i> large marsh grasshopper	English Nature	CABI Bioscience	17

Table 2: Species groupings

Group number	Description	Species
1	Heathland moths	Cyclophora pendularia and Ascosmetia caliginosa
2	Aculeates of lowland heathlands (open, dry sandy heaths)	Chrysis fulgida, Formica rufibarbis, Homonotus sanguinolentus and Pseudepipona herrichii
3	Heathland flies (open, dry sandy heaths)	Thyridanthrax fenestratus and Bombylius minor
4	Margin vegetation of lakes, ponds, tarns and rivers	Donacia aquatica and Donacia bicolora
5	Scottish herb-rich grasslands	Bombus distinguendus and Colletes floralis
6	Aculeates of flower-rich grasslands	Andrena ferox, Andrena gravida, Cerceris quadricincta, Cerceris quinquesfasciata and Nomata armata
7	Bumble-bees of flower-rich grasslands	Bombus humilis, Bombus ruderatus and Bombus subterraneus
8	Calcareous grassland moths	Aspitates gilvaria, Cucullia lychnitis, Heliophobus reticulata, Polia bombycina, Siona lineata and Tyta luctuosa
9	Unimproved grassland moths	Hemaris tityus and Mythimna turca
10	Saproxylic hoverfly group	Hammerschmidtia ferruginea and Blera fallax
11	Wet seepages in damp woodlands and wooded streams	Lipsothrix ecucullata, Lipsothrix nervosa, and Lipsothrix nigristigma
12	Open oak woodlands	Dicycla oo, Jodia croceago and Pechipogo strigilata
13	New Forest oak woods - moths	Catocala promissa and Catocala sponsa
14	New Forest species	Cicadetta montana, Pterostichus aterrimus, Pterostichus kugelanni and Helophorus laticollis
15	Cryptocephalus species	Cryptocephalus nitidulus, Cryptocephalus primarius and Cryptocephalus sexpunctatus

16	Tiger beetles	<i>Cicindela germanica</i> , <i>Cicindela sylvatica</i> and <i>Cicindela hybrida</i>
17	Crickets/grasshoppers	<i>Stethophyma grossum</i> and <i>Decticus verrucivorus</i>
18	<i>Zygaena</i> species - Scotland	<i>Zygaena loti scotica</i> and <i>Zygaena viciae argyllensis</i>

Table 3: Species Statements

Species name	Common name
Coleoptera	
<i>Badister collaris</i>	a ground beetle
<i>Chrysolina cerealis</i>	rainbow leaf beetle
<i>Dyschirius angustatus</i>	a ground beetle
<i>Hydroporus cantabricus</i>	a diving beetle
Diptera	
<i>Lipsothrix errans</i>	a crane fly
<i>Myolepta potens</i>	a hoverfly
<i>Rhabdomastix laeta</i>	a crane fly
<i>Tipula serrulifera</i>	a crane fly
Hymenoptera	
<i>Chrysura hirsuta</i>	a cuckoo wasp
<i>Evagetes pectinipes</i>	a spider-hunting wasp
<i>Lasioglossum angusticeps</i>	a solitary bee
<i>Nomada ferruginata</i>	a cuckoo bee
Lepidoptera	
<i>Aricia artaxerxes</i>	northern brown argus
<i>Calophasia lunula</i>	toadflax brocade
<i>Hadena albimacula</i>	white-spot
<i>Hydraecia osseola hucherardi</i>	marsh mallow
<i>Minoa murinata</i>	drab looper
<i>Moma alpium</i>	scarce merveille du jour
<i>Paracolax derivalis</i>	clay fan-foot
<i>Paradiarsia sobrina</i>	cousin German
<i>Phyllodesma ilicifolia</i>	small lappet
<i>Polymixis xanthomista</i>	black-banded
<i>Trisateles emortualis</i>	olive crescent

Xestia alpicola alpina	northern dart
Other Invertebrates	
Clubiona subsultans	a spider
Uloborus walckenaerius	a spider
Hydrometra gracilentata	the lesser water measurer
Prostoma jenningsi	a freshwater nemertean