# European policy instruments for pollinator conservation

*Stuart Roberts &*
*Simon G. Potts*

University of Reading

Penn State; 26 July 2010

# Key European policy instruments

- Prior to 1990...
- Since 1990

| Instrument | Global | Continental | National | Local |
|---|---|---|---|---|
| Convention on Biological Diversity | ✔ | | | |
| Biodiversity Action Plans | | | ✔ | ✔ |
| Agri-Environment Schemes | | ( ✔ ) | ✔ | |
| Protected Area legislation | | ✔ | ✔ | ✔ |
| Red Lists | | 2015 | ✔ | |

- Economics...can help!

# International Pollinator Initiative

- Conference Of the Parties to the Convention on Biological Diversity IX/1 (Oct 2008):

1. To complete **information on pollinator species**, populations and their taxonomy, ecology and interactions;
2. To establish the **framework for monitoring declines** and **identifying their causes**;
3. To assess the agricultural production, ecological, and socio-economic **consequences of pollinator declines**;
4. To compile information on **best practices** and lessons learned;
5. To develop **response options** to promote, and prevent the further loss of, pollination services that sustain human livelihoods;
6. To **disseminate openly the results** through the clearing-house mechanism and other relevant means.

# National Biodiversity Strategies

- National strategy and detailed plans to **describe** and **protect** biological diversity
- Partnership **>300 organisations** to identify priorities; revised regularly (2010 review)
- Action plans:
  - Species: 1150 including Bees (20/250), Butterflies (24/56), Hoverflies (7/250)
  - Habitats – 65 priority habitats including many important for pollinators (e.g. meadows, hedgerows)
  - Local – reflect local priorities

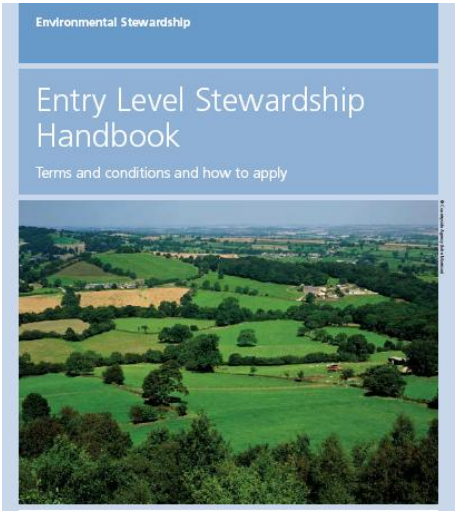
# Agri-environment schemes

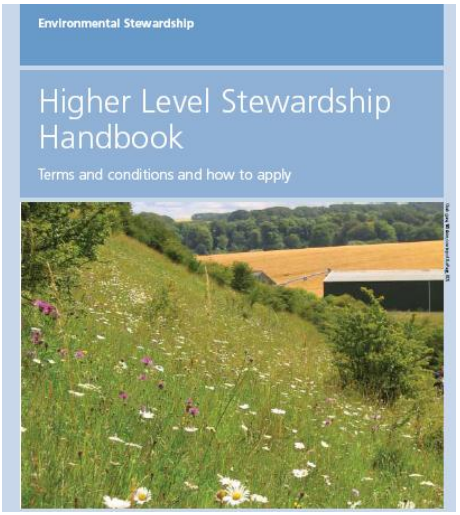
- European minimum legal requirement – “Good Farming Practice”
- Move beyond this baseline to preserve the environment and safeguard the countryside:
  - Programmes are **mandatory** for all European Member States
  - Agreements are **voluntary** for farmers (5-10 yr contract)

- Farmers paid for environmental services
  - Payments cover income foregone, costs incurred and necessary incentive
  - Payments are **DECOUPLED** from production!

# English schemes

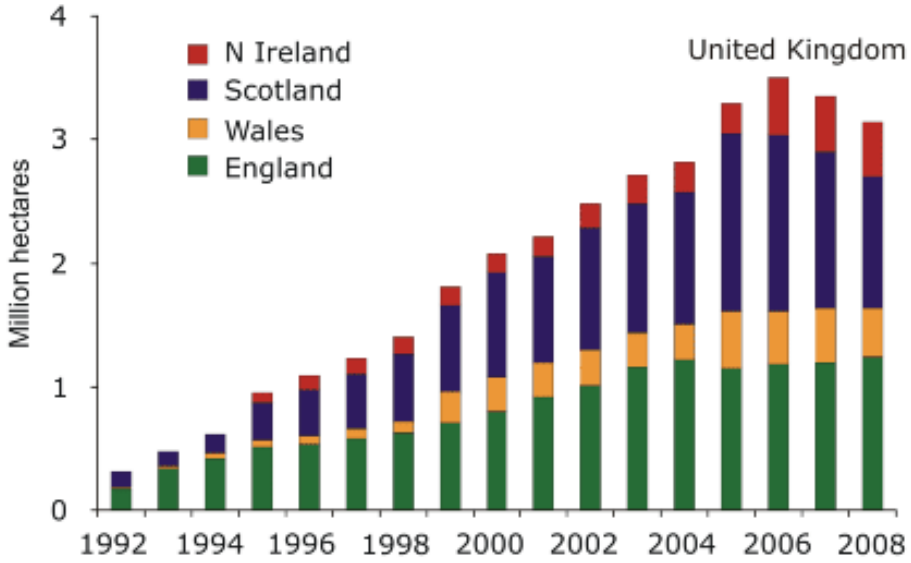
- **Environmental Stewardship (2003-)**
- **ENTRY level scheme:**
  - **Voluntary**
  - **High level of uptake**
  - **Simple & effective management**
  - **Wider biodiversity**
- **HIGHER level scheme:**
  - **Voluntary**
  - **Targeted at priority habitats and species**
  - **Specific environmental outcomes**

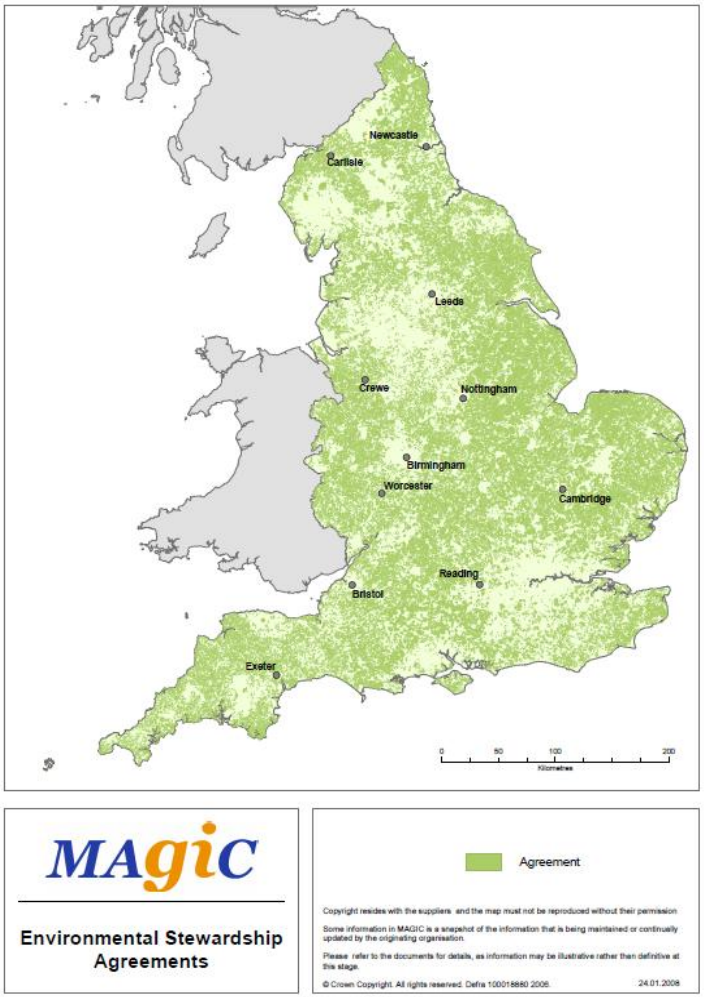


# Entry Level Scheme

- **High uptake**



# Entry Level Scheme

- High uptake
- Menu of options
- Points per option
- Reach target for payment

3 **Entry Level Stewardship Handbook**
List of options, management requirements and points allocations

| Code | Option | Units | Points | Handbook page |
|---|---|---|---|---|
| **OPTIONS FOR ARABLE LAND – continued** | | | | |
| EF3 | Wild bird seed mixture on set-aside land | ha | 85 | 58 |
| EF4 | Pollen and nectar flower mixture | ha | 450 | 59 |
| EF5 | Pollen and nectar flower mixture on set-aside land | ha | 85 | 60 |
| EF6 | Over-wintered stubbles | ha | 120 | 60 |
| EF7 | Beetle banks | ha | 580 | 61 |
| EF8 | Skylark plots | plot | 5 | 62 |
| EF9 | Conservation headlands in cereal fields | ha | 100 | 63 |
| EF10 | Conservation headlands in cereal fields with no fertilisers or manure | ha | 330 | 64 |
| EF11 | 6m uncropped, cultivated margins on arable land | ha | 400 | 64 |
| **OPTIONS TO ENCOURAGE A RANGE OF CROP TYPES** | | | | 66 |
| EG1 | Under sown spring cereals | ha | 200 | 66 |
| EG2 | Wild bird seed mixture in grassland areas | ha | 450 | 66 |
| EG3 | Pollen and nectar seed mixtures in grassland areas | ha | 450 | 67 |
| EG4 | Cereals for whole crop silage followed by over-wintered stubbles | ha | 230 | 68 |
| EG5 | Brassica fodder crops followed by over-wintered stubbles | ha | 90 | 69 |
| **OPTIONS TO PROTECT SOILS** | | | | 70 |
| EJ1 | Management of high erosion risk cultivated land | ha | 18 | 72 |
| EJ2 | Management of maize crops to reduce soil erosion | ha | 18 | 72 |
| **OPTIONS FOR LOWLAND GRASSLAND OUTSIDE THE LFA** | | | | 73 |
| EK1 | Take field corners out of management | ha | 400 | 73 |
| EK2 | Permanent grassland with low inputs | ha | 85 | 73 |
| EK3 | Permanent grassland with very low inputs | ha | 150 | 74 |
| EK4 | Management of rush pastures (outside the LFA) | ha | 150 | 75 |
| EK5 | Mixed stocking | ha | 8 | 76 |
| **OPTIONS FOR THE UPLANDS (LFA LAND)** | | | | 78 |
| EL1 | Field corner management (LFA land) | ha | 100 | 78 |
| EL2 | Manage permanent in-bye grassland with low inputs | ha | 35 | 78 |
| EL3 | Manage in-bye pasture and meadows with very low inputs | ha | 60 | 79 |
| EL4 | Management of rush pastures (LFA land) | ha | 60 | 80 |
| EL5 | Enclosed rough grazing | ha | 35 | 81 |
| EL6 | Moorland and rough grazing | ha | 5 | 82 |
| **MANAGEMENT PLANS** | | | | 83 |
| EM1 | Soil management plan | ha | 3 | 83 |
| EM2 | Nutrient management plan | ha | 2 | 84 |
| EM3 | Manure management plan | ha | 2 | 84 |
| EM4 | Crop protection management plan | ha | 2 | 85 |

# Entry Level Scheme

- High uptake
- Menu of options
- Points per option
- Reach target for payment
- Options:
  - Taking areas out of production


Taking field corners out of management provides valuable habitat for insects and birds

# Entry Level Scheme

- High uptake
- Menu of options
- Points per option
- Reach target for payment
- Options:
  - Taking areas out of production
  - Sowing flower meadows
  - Increasing crop variety


Permanent pastures – very low inputs of fertiliser and herbicide make better wildlife habitats

# Entry Level Scheme

- High uptake
- Menu of options
- Points per option
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- Options:
  - Taking areas out of production
  - Sowing flower meadows
  - Increasing crop variety
  - Boundary management

# Entry Level Scheme

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  - Taking areas out of production
  - Sowing flower meadows
  - Increasing crop variety
  - Boundary management
  - Field margins…

# Field margins

Benefits

Establishment

Maintenance

Restrictions

Points value

## EF4 Pollen and nectar flower mixture

Incorporating flowering plants in a plot will boost the numbers of pollen and nectar feeding insects, including butterflies and bumblebees.

Pollen and nectar mixtures increase numbers of beneficial insects such as bees

For this option you must:

- Sow a mixture of at least three pollen and nectar rich plants (e.g. red clover, alsike clover, bird's-foot-trefoil), with no single species making up more than 70% of the mix. The inclusion of non-aggressive grasses (e.g. meadow fescue, sheep's fescue, smooth stalked meadow grass) can help reduce the impact of annual weeds.
- Sow in strips at least 6 m wide at the edges of fields and/or in blocks during July to August or mid-March to mid-April.
- Blocks or strips must not exceed 0.5 ha and you must have no more than one block or strip per 20 ha. This is to ensure that blocks and strips are well distributed across the land.
- Re-establish the mix as necessary to maintain a sustained pollen and nectar supply.
- Apply herbicides only to spot treat or weed wipe for the control of injurious weeds (i.e. creeping or spear thistle, curled or broadleaved dock, or common ragwort), or invasive alien species (e.g. Himalayan balsam, rhododendron or Japanese knotweed). However, contact, non-residual, products may be applied prior to re-establishment.
- Do not apply any other pesticides, fertiliser, manure or lime.
- To stimulate late flowering, cut half the area to 20 cm in June and the whole area to 10 cm between 15 September and 31 October, ideally removing cuttings.
- The area must not be used for access, turning or storage.
- Winter/autumn grazing benefits legumes and is allowed, but do not graze in the spring or summer and avoid poaching.

*EF4, 450 points per ha*

# Higher Level Scheme

- Aims to deliver significant environmental benefits in high priority situations
- Competitive entry with discretionary award
- Requires Farm Environment Plan in consultation with expert advisors
- Specialist options:
  - Habitat restoration
  - Arable conversion to grassland
- 10 year agreement

© Defra (Robert Goodson)

Brown hairstreak butterflies benefit from sensitive management of blackthorn scrub

# Economic case for policy

- **Total value** of pollination services to UK crops is **$750 million** p.a. (~10% of the total value of agriculture)
- **Replacement cost** of this service, using hand pollination, would be **$2,570 million** p.a.
- **Avoidance cost**, based on the assumption that pollinators can be maintained by sowing 2.5% of farmland with a 'pollen and nectar' flower mix, would be **$45 million** p.a.
- The cost of avoiding pollinator loss is less than **2%** of the cost of replacing them
- Protection is therefore the best option for ensuring sustainable delivery of pollination services for agriculture

| Crop | Dependence on Pollinators (%) | Value p.a. (£'000,000) |
|---|---|---|
| Oilseed Rape | 25 | 106 |
| Strawberry | 45 | 72 |

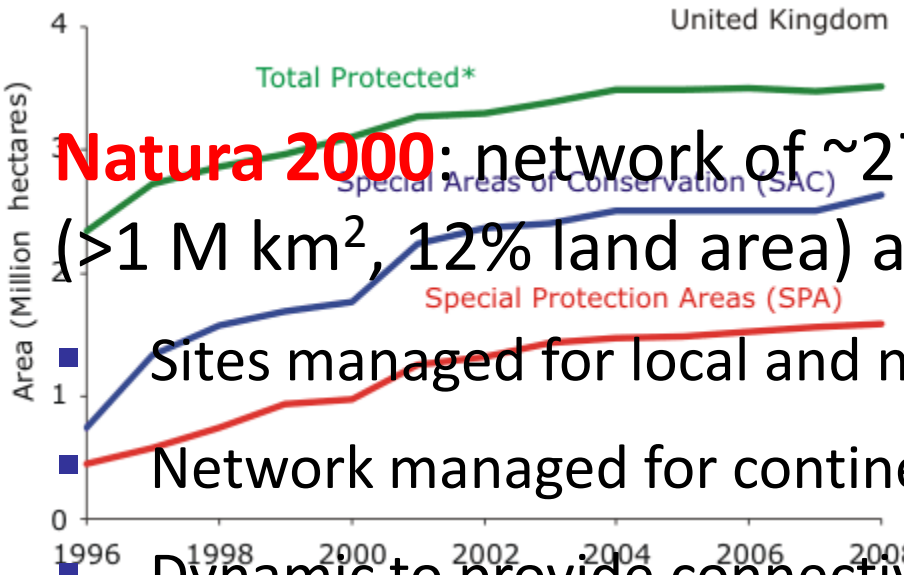
| Crop | Replacement Cost £ / ha | Total cost £ '000,000 |
|---|---|---|
| Oilseed Rape | 1,779 | 1,048 |
| Blackcurrants | 55,741 | 145 |
| Field Beans | 1786 | 118 |
| Strawberries | 21,186 | 83 |
| Linseed | 1,779 | 55 |
| Raspberries | 10,760 | 28 |
| Other Soft Fruit | 13,372 | 11 |
| Tomatoes | 43,842 | 9 |
| Dessert Apples | 3,76 | 2 |
| Broad Beans | 376 | 2 |
| Others | 376-16,443 | 6 |
| TOTAL | | 2,510M |

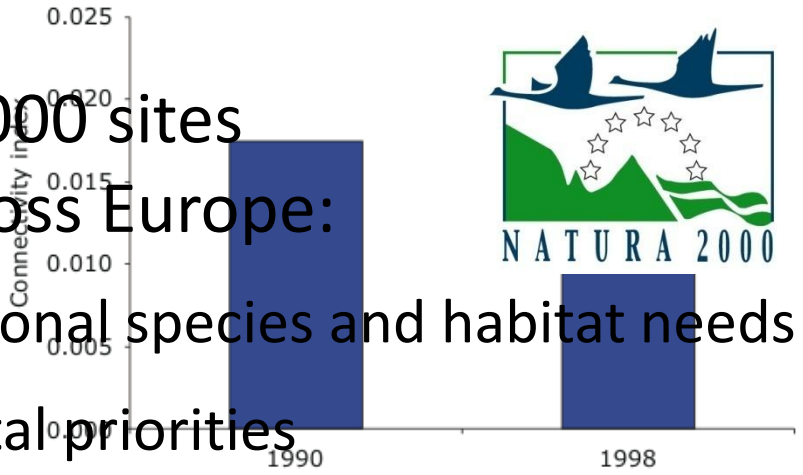


University of Reading

# Protected Area legislation

- Designation based upon habitat, species and cultural criteria (European Directives):
  - Rarely designated for pollinator species (butterflies, hoverfly)
  - Often designated for broad habitats used by pollinators

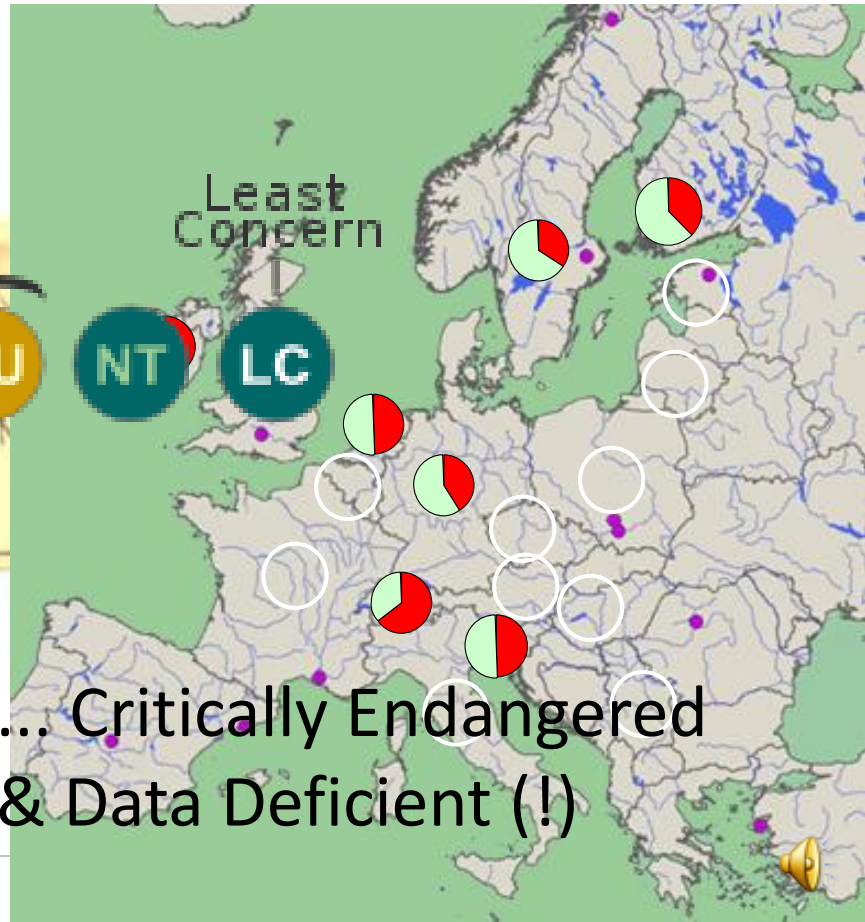



- **Natura 2000**: network of ~27,000 sites (>1 M km$^2$, 12% land area) across Europe:
  - Sites managed for local and national species and habitat needs
  - Network managed for continental priorities
  - Dynamic to provide connectivity under global change

# IUCN Red Lists

- Red lists assess extinction risks (≠ conservation priority)
- **Global Red List**: 2 species: *Bombus franklini & Megachile pluto*
- **Regional Red Lists**:
  - **8** of 25 EU countries have a national list
  - Average of 45% of species included (35-60%)
  - Developing **European Red List** (expected 2015)
  - Basis for conservation actions


... Critically Endangered & Data Deficient (!)

# Conclusions

- Pollinator conservation is a **multi-sector** (protected areas, agriculture) and **multi-scale** (global to local) challenge

- The most effective tools appear to be those with **high level objectives** and **local implementation**

- European policy tools take into account **pollinators** but will increasingly need to consider **pollination services**

- To remain effective under global change, existing policy instruments will need to be both **dynamic** and **adaptive**

# Acknowledgements

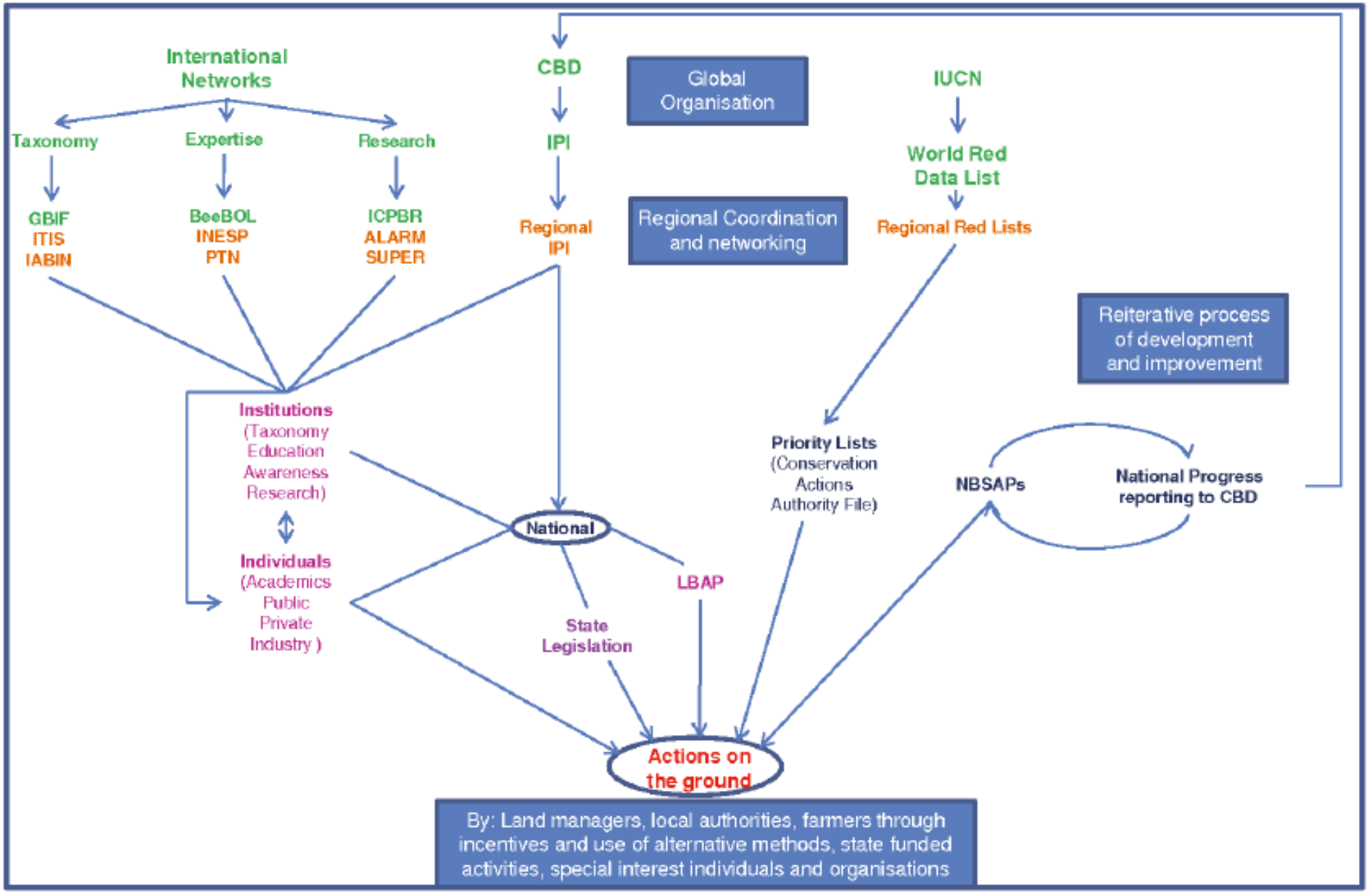
**Resources:**

- CBD: http://www.cbd.int
- UK BAP: http://www.ukbap.org.uk
- Environmental Stewardship: http://www.naturalengland.org.uk
- Natura 2000: http://ec.europa.eu/environment/nature/natura2000
- IUCN: http://www.iucn.org


- **Pollinator group at Reading University**
- **Colleagues in ALARM, SCALES and STEP projects**



- **More info:** s.g.potts@reading.ac.uk


International Networks
Taxonomy
Expertise
Research
GBIF
ITIS
IABIN
BeeBOL
INESP
PTN
ICPBR
ALARM
SUPER
CBD
IPI
Regional IPI
Global Organisation
Regional Coordination and networking
IUCN
World Red Data List
Regional Red Lists
Reiterative process of development and improvement
Institutions
(Taxonomy
Education
Awareness
Research)
Individuals
(Academics
Public
Private
Industry )
National
LBAP
State Legislation
Priority Lists
(Conservation Actions Authority File)
NBSAPs
National Progress reporting to CBD
Actions on the ground
By: Land managers, local authorities, farmers through incentives and use of alternative methods, state funded activities, special interest individuals and organisations

# Bees/wasps

- Andrena ferox (a Mining Bee)
- Andrena gravida (Banded Mining Bee)
- Andrena lathyri (a Mining Bee)
- Bombus distinguendus (Great Yellow Bumblebee)
- Bombus humilis (Carder Bumblebee)
- Bombus ruderatus (Large Garden Bumblebee)
- Bombus subterraneus (Short-haired bumble-bee)
- Bombus sylvarum (Shrill Carder Bee)
- Cerceris quadricincta (a Solitary Wasp)
- Cerceris quinquefasciata (a Solitary Wasp)
- Chrysis fulgida (Ruby-tailed Wasp)
- Chrysura hirsuta (Cuckoo Wasp)
- Colletes floralis (The Northern Colletes)
- Evagetes pectinipes (a Spider-hunting wasp)
- Homonotus sanguinolentus (a Spider-hunting wasp)
- Lasioglossum angusticeps (Solitary bee)
- Nomada armata (a Cuckoo Bee)
- Nomada errans (a Cuckoo Bee)
- Nomada ferruginata (a Cuckoo Bee)
- Osmia inermis (a Mason Bee)
- Osmia parietina (a Mason Bee)
- Osmia uncinata (a Mason Bee)
- Osmia xanthomelana (a Mason Bee)
- Pseudepipona herrichii (Purbeck Mason Wasp)

# Great Yellow Bumblebee (*Bombus distinguendus*)




Image enquiries: Mike Edwards

## Current status

Most records of this bee have been associated with extensive areas of meadowland supporting a large number of plant species with long corolla flower types, notably those belonging to the plant families Fabaceae and Lamiaceae. It is one of a number of bumblebee species to have undergone a drastic reduction in range and abundance as a result of the loss of this habitat in the modern agricultural landscape. On the Hebrides during August 1997 it was strongly associated with areas that had been winter-grazed and then allowed to grow throughout the summer. Such areas supported good stands of red clover and common knapweed, both of which were important forage plants. Nests are constructed underground. The number of workers of the great yellow bumblebee per nest is often noted as being particularly low, with workers being of a large size.

This species is widespread in northern and central Europe and in Asia, although it is declining in many parts of its range. In the UK, there are post-1960 records for scattered localities across England, Scotland and Wales. However, records since 1970 are very strongly biased towards the extreme north of Scotland, with most being from the Outer Hebrides. Searches during 1997 showed there to be good populations associated with machair systems on the islands south of, and including, North Uist. There are also recent (post-1990) records from Orkney, Coll, Tiree and Sutherland. There are pre-1960 records from Northern Ireland.

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

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

## Current factors causing loss or decline

Loss of extensive, herb-rich grasslands.

## Current action

This species is the subject of an SNH Pre-Recovery Project.

Some populations are on SSSIs and RSPB reserves.

## Action plan objectives and targets

Maintain populations at all known sites.

Enhance the population size at all known sites by 2010.

## Proposed actions with lead agencies

### Policy and legislation

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)

### Site safeguard and management

Where possible, ensure that all occupied habitat is appropriately managed by 2008, for example through SSSI or agri-environment scheme management agreements. (ACTION: CCW, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)

Ensure that the habitat requirements of the great yellow bumblebee are taken into account in any relevant development policies, plans and proposals. (ACTION: CCW, EN, EHS, SNH, LAs)

Ensure that this species is included in site management documents for all relevant SSSIs/ASSIs. (ACTION: CCW, EHS, EN, SNH)

Consider notifying as SSSIs/ASSIs sites supporting viable populations of the great yellow bumblebee, where this is necessary to secure long-term protection and appropriate management. (ACTION: CCW, EHS, EN, SNH)

### Advisory

Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: CCW, Crofters Commission, DANI, EHS, EN, MAFF, SNH, SOAEFD, WOAD)

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)

### Future Research and Monitoring

Undertake surveys to determine the range and status of this bee by 2005. (ACTION: CCW, EHS, EN, SNH)

Continue autecological research targeted to identify key habitat features, such as sources of nectar and pollen, nesting sites, and areas used for mating and over-wintering, in order to inform habitat management. (ACTION: CCW, EHS, EN, SNH)

Establish a regular monitoring programme. (ACTION: CCW, EHS, EN, SNH)

Pass information gathered through survey and monitoring of this species to a central database so that it can be incorporated into national databases. (ACTION: CCW, EHS, EN, SNH)

### Communications and Publicity

Promote opportunities for the appreciation of the 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, EHS, EN, SNH)

### Links with other action plans

None given.

## Lead partner(s)

Andy Knight, Royal Society for the Protection of Birds Tel:01856 850176

Mike Edwards, Bombus Working Group

## Local implementation

The following LBAPs are working on *Bombus distinguendus*:

NBN Gateway - interactive species mapper - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links Google Hotmail Webmail Vac WoK Library CAER EPI Weather Met BT

Back Search Favorit http://lc1.law5.hotmail.passport.com/cgi-bin/login

Address http://www.searchnbn.net/interactive/map.jsp?srchSp=28606&BBOX=-405000.0,-10000.0,915000.0,1310000.0&MAPSERVICE=interactiveGBv4&dsKeys=GA000180,GA000163,G Go

## Interactive map of Great Yellow Bumble Bee (*Bombus distinguendus*)

This interactive map allows you to view species records with a range of overlays and backgrounds, zoom in on records and get information about them. It has been compiled from the datasets you have access to. Please choose the datasets that best meet your needs.

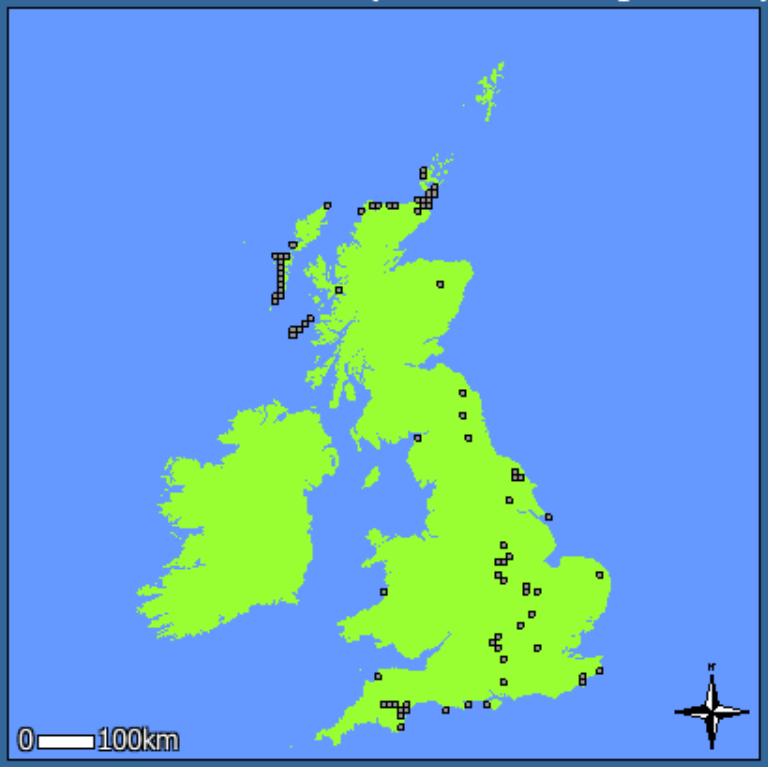
### Great Yellow Bumble Bee (*Bombus distinguendus*)

**Navigation**
- Zoom in
- Zoom out
- Full view
- Move map

**Information**
- Select records
- Query records
- Clear selection

**Guidance**
- Show legend

**View Controls**
- Increase map size
- Decrease map size
- Change species




**Resolution**
- 10km
- 2km
- 1km
- 100m

**Background**
- Ordnance Survey
- Land Cover Map 2000

Make records transparent

**Boundary**
None

Refresh the map



Done Internet

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NBN Gateway - interactive species mapper - Microsoft Internet Explorer

File Edit View Favorites Tools Help | Links Google Hotmail Webmail Vac WoK Library CAER EPI Weather Met BT

Back Search Favorites Media

Address http://www.searchnbn.net/interactive/map.jsp Go

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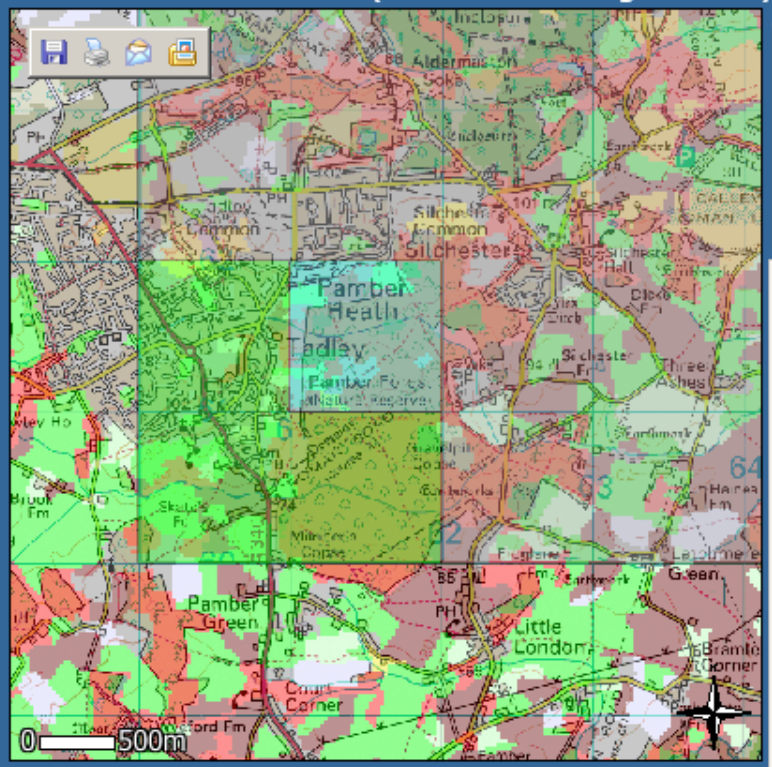


**Resolution**
- 10km
- 2km
- 1km
- 100m



NBN Gateway - Map Legend - Microsoft Internet E

### Land Cover Map 2000

- Broad-leaved woodland
- Coniferous woodland
- Arable and horticultural
- Improved grassland
- Neutral grassland
- Calcareous grassland
- Acid grassland
- Bracken
- Dwarf shrub heath
- Fen, marsh and swamp
- Bog
- Standing water

Coords: 463939,162928 (SU 639 629)

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## Datasets available for *Bombus distinguendus* to use

You have access to use the datasets listed below. These datasets have data based on your current query options. Changing your query options may change the datasets available to use.

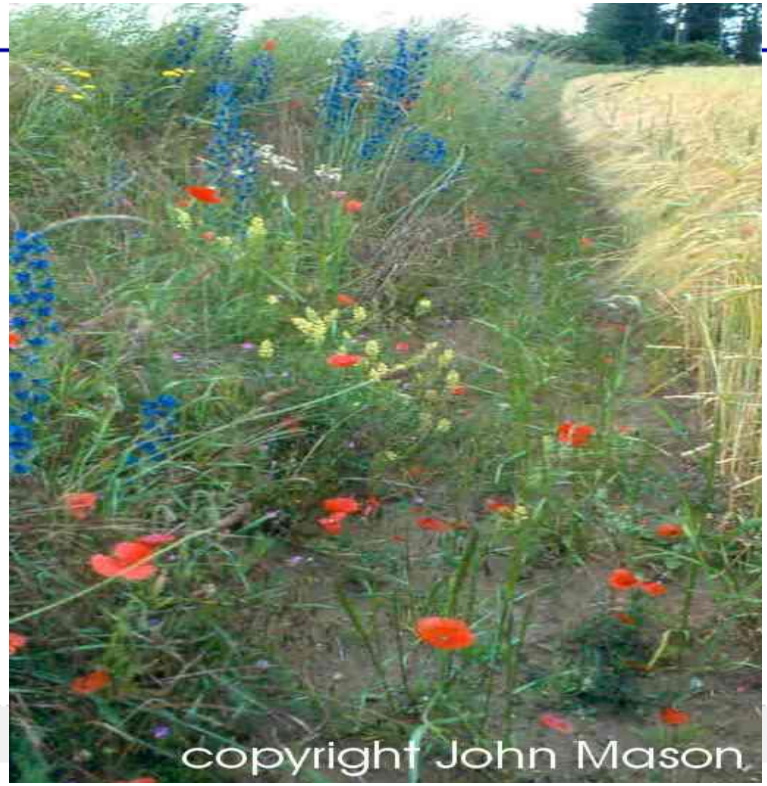
| Use | Dataset (Click the title for more information) | Dataset Resolution | Your Resolution | Sensitive access | Download raw data | View Attributes | View Recorder |
|---|---|---|---|---|---|---|---|
| | Bees, Wasp and Ants Recording Society | | | | | | |
| ☑ | Bees, Wasps and Ants Recording Society - Trial Dataset | 100m | 10km | | | | |
| | Countryside Council for Wales | | | | | | |
| ☑ | UK Biodiversity Action Plan: Invertebrate data for Ceredigion | 100m | Full | | ✓ | | |
| | English Nature | | | | | | |
| ☑ | Invertebrate Site Register - England. | 100m | Full | | ✓ | ✓ | ✓ |
| | Highland Biological Recording Group | | | | | | |
| ☑ | Highland Biological Recording Group Full Dataset | 100m | 2km | | ✓ | | |
| | Leicestershire Environmental Resources Centre | | | | | | |
| ☑ | Leicestershire Aculeate records | 100m | 1km | | | | |

select datasets | deselect datasets | refresh

## Habitat Action Plan

# Cereal field margins






## Current Status

### Definition

For the purposes of this Action Plan the term "cereal field margin" refers to strips of land lying between cereal crops and the field boundary, and extending for a limited distance into the crop, which are deliberately managed to create conditions which benefit key farmland species. They can take a variety of forms, the principal types being:

A 'Wildlife Strip' 6m wide adjacent to a cereal crop, together with a.1 m 'Sterile Strip' between the wildlife strip and thecrop. The wildlife strip is cultivated once a year but not cropped; the Sterile Strip is maintained so as to prevent aggressive arable weeds spreading into the adjacent cereal crop.
A 'Conservation Headland' either 6m or.12m wide forming the outer margin of the crop and separated from an adjacent field boundary or other vegetation by a.1 m Sterile Strip. The Conservation Headland is cropped with cereals but is managed with reduced inputs of pesticides so as to favour wild arable plants and invertebrates.

## Current factors affecting the habitat

The main factors which have reduced the wildlife value of cereal crops are:

Intensification of cereal production, including the use of herbicides to ensure a weed free monoculture, and summer use of insecticides.
The shift to winter cropping and the associated loss of winter stubbles.
The reduction in rotation of cereal crops with other land covers (including grass leys and fallows).
The reduction in the undersown area associated with the shift to winter cropping. Undersown cereal crops are important for overwintering sawflies.

The geographical retreat of cereal growing from many northern and western areas means that this habitat no longer occurs in large parts of the UK, particularly the Less Favoured Areas (LFAs).

Grassy field margins are retained by some framers to act as buffers to cereal fields: management is usually minimal.

## Current Action

### Legal status

Under the Food and Environment Protection Act.1985 it is illegal to spray pesticides into hedge bases, unless there is a specific label recommendation or a specific off-label approval.

Under the current procedures for pesticide registration and review, some compounds have statutory label exemptions preventing their use on the outermost 6 metre wide strips of crops. These restrictions are designed to prevent overspraying of water courses and protect non-cropped habitats.

### Management, research and guidance

Cereal field margins are targeted under two basic management options in several environmental and land management schemes including ESAs (five areas in England, five in Wales and two in Scotland) the Countryside Stewardship Scheme, in England which has a tailored scheme for cirl bunting Emberiza cirlus, and Tir Cymen in Wales. The options are: 'wildlife strips' and 'conservation headlands' and in Wales Tir Cymen also offers the option of 'rough grass margins'. There is also an 'arable option' in the western Isles ESA (for a maximum of only one ha per farm). Cereal field margins are also being managed in some areas, either voluntarily or with Government support, as 'grass wildlife strips' or undersown conservation headlands".

Farmers can meet their set-aside requirements by setting-aside field margins of a minimum 20 metre width. However, set-aside strips of 10m are now allowed when they are situated along permanent watercourses and lakes. The scheme literature advises farmers on how best to manage the margins to benefit wildlife. This may encourage more farmers to set-aside their land as field margins.

Some1,530 km (185 ha) of conservation headlands have also been established by some 100 farmers under initiatives encouraged by the Game Conservancy Trust. Most farms are outside ESAs and receive no payment, although the DETR provides support to The Game Conservancy Trust to employ a Field Adviser to oversee deployment and efficacy.

## Action plan objectives and targets

Maintain, improve and restore by management the biodiversity of some 15,000 ha of cereal field margins on appropriate soil types in the UK by 2010.

## Proposed actions with lead agencies

### Policy and legislation

Assess in terms of ecology, pedology and value for money, the most appropriate geographical areas to target cereal field margin options (i.e. wildlife strips, conservation headlands and grass margins) under environmental schemes and consider developing and extending cereal field margin options in appropriate ESAs and under Countryside Stewardship and Tir Cymen. (ACTION: MAFF, SOAEFD, WOAD)

Review payment rates for cereal field margin options to assess whether they provide an adequate incentive for take-up on small areas on any one farm. (ACTION: MAFF, SOAEFD, WOAD)

Review management guidelines for wildlife strips and conservation headlands in the light of research findings and advance in pesticides. (ACTION: MAFF, SOAEFD, WOAD)

Consider the costs and benefits associated with promoting environmental management of field margins for crops other than cereals. (ACTION: MAFF, SOAEFD, WOAD)

Ensure that any findings from research programmes on pesticides which are relevant to the management of cereal field margins are reflected in future policy and are communicated to interested bodies. (ACTION: MAFF, SOAEFD, WOAD)

### Site safeguard and management

Promote management favourable to cereal field margins through appropriate environmental schemes. (ACTION: CCW, DANI, EN, MAFF, SNH, SOAEFD, WOAD)

Consider extending current advisory network by providing at least two full-time, skilled BASIS advisors nationally to assist the Field Advisors currently employed by the Game Conservancy Trust.

### Advisory

Review existing guidance on conservation management of cereal field margins and promote new guidelines where appropriate. (ACTION: MAFF, SOAEFD, WOAD)

Consider options for a network of field advisors who can provide up-to-date information on favourable conservation management practices. (ACTION: DoE, SO, WO, MAFF, SOAEFD, WOAD)

Develop training courses on cereal field margin management and target these on land management advisers (e.g. ADAS, ELMS staff, Agricultural College and University Staff) groups of farmers, and major landowners (e.g. National Trust), and pesticide spray contractors. (ACTION: CCW, EN, SNH)

## Local implementation

The following LBAPs are working on Cereal field margins:

A 50 Year Vision for the Wildlife and Natural Habitats of Hertfordshire
A Biodiversity Action Plan for Northamptonshire
A local Biodiversity Action Plan for Swansea
Action for Wildlife in Nottinghamshire
Barnsley Biodiversity Action Plan
Bedfordshire and Luton
Biodiversity Action Plan for Gloucestershire
Biodiversity Action Plan for Hampshire
Biodiversity Action Plan for Leeds
Birmingham and Black Country
Brighton & Hove Biodiversity Action Plan
Cairngorms LBAP
Cambridgeshire Biodiversity Action Plan
Clackmannanshire Biodiversity Partnership
Cornwall's Biodiversity vol 1, 2 and 3
Cotswold Water Park Biodiversity Action Plan
Countdown - the Cheshire region Biodiversity Action Plan
East Lothian Biodiversity
Essex Biodiversity Project
Kirklees Biodiversity Action Plan
Lancashire's Biodiversity Action Plan
Leicester, Leicestershire and Rutland
Lincolnshire Biodiversity Action Plan
Local Biodiversity Action Plan for Neath-Port Talbot 2001-2006
Norfolk Biodiversity Action Plan
North East Scotland Biodiversity Partnership