



Department
for Environment
Food & Rural Affairs

www.defra.gov.uk

Supporting document: additional background material on the proposed National Pollinator Strategy and actions

March 2014

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1. Purpose of this document

1. This document has been produced to support the main consultation document on the National Pollinator Strategy. It includes supplementary material that some consultees might find useful. In particular, you might wish to read this document if you want to know more about:
 - how the Strategy was developed;
 - the background to, and context of proposed priority policy actions 1 to 16; and further details on issues we will consider during implementation;
 - insect monitoring in the UK, as background to the Strategy's proposal to develop a pollinator monitoring programme.

2. Further details on how the Strategy was developed

2. At the Friends of the Earth Bee Summit in June 2013, the Government announced a commitment to produce a National Pollinator Strategy in collaboration with interested groups, and the launch of an independent Status Report, commissioned by Defra from a team from the Centre for Ecology and Hydrology, Reading University and Stirling University, led by Dr Adam Vanbergen. This 'Status Report', which was published at the same time as this consultation on the draft Strategy, provides an overview of the current status of evidence on pollinators, highlighting gaps for further research.
3. An Expert Advisory Group, chaired by Professor Charles Godfray was set up in summer 2013 to advise Government on the scientific evidence necessary to support the National Pollinator Strategy. This group offered advice and feedback to Dr Adam Vanbergen and his team during the development of the 'Status Report'.
4. After their Bee Summit, Friends of the Earth convened an Advisory Group of key interested parties, including Defra representatives. This met several times in summer and autumn 2013 to consider proposals for the Strategy. The future role of the group in the implementation phase of the Strategy is currently being explored.
5. Alongside evaluating the scientific evidence, Government undertook various strands of work to analyse existing provision for pollinators. A Stakeholder Scoping Report from behavioural researchers at Birmingham City and Newcastle Universities identified the various groups with an interest in pollinators and their existing initiatives to help pollinators. The report from this work will be published on the Defra Science Pages of www.gov.uk in early 2014.

6. In October 2013, an expert workshop organised by the National Biodiversity Network and chaired by Professor Michael Hassell (NBN Trust) made recommendations on the how best to fulfil our monitoring needs for pollinators.
7. These many strands of work came together in a National Pollinator Strategy Stakeholder Workshop, at the end of October 2013, which was attended by 65 organisations including businesses, retailers, academia, farmers and growers, land managers, local government and Defra and its agencies. The workshop was co-chaired by Professor Charles Godfray of Oxford University and Dr Andy Hart of the Food and Environment Research Agency. The purpose of the workshop was to achieve a shared understanding of the current status of pollinators and the policies and initiatives currently in place to counteract threats against them. Attendees identified new initiatives to consider for inclusion in the National Pollinator Strategy, as well as improvements to existing activities. The outcome of this workshop was a list of 28 proposals identified as priorities for action on pollinators.
8. Groups and organisations invited to the Stakeholder Workshop were also requested to complete an on-line questionnaire. The questionnaire canvassed opinion on the evidence base (from the 'Status Report'), the general approach to considering the future for pollinators and the efficacy of current actions that might support pollinators. Additionally, responders were asked to provide suggestions for further activities that could improve evidence on the status of pollinator or provide direct benefits for them. Although a relatively small number of responses were received (22), these were useful in shaping the Workshop activities and in informing development of the Strategy.
9. After the Stakeholder Workshop, Government continued to engage the group of core interested groups who attended the workshop, seeking feedback and dialogue on how the proposals could be integrated into the National Pollinator Strategy as practical, specific, priority actions. During November 2013, Government convened meetings of subgroups, attended by key interested parties including NGOs, academics, retailers, professional bodies, delivery agencies and policy makers, for each of the Strategy's key themes. This work helped to inform and finalise the proposals set out the proposed Strategy.

3. Further background on Priority Action 1 - the 'Call to Action'

Priority Action 1: Create 'Call to Action' package for bees and other pollinators

10. The 'Call to Action' advice (see Chapter 3 of the consultation document on the Strategy) will cover the three main types of land use and audiences:
 - Farmland;
 - The urban landscape including public land, transport and other infrastructure. The measures and advice will also be relevant for contractors who provide vegetation management services; and,
 - Gardens in villages, towns and cities.
11. Natural England will work with academia, conservation practitioners, NGOs and others during 2014, using both published and unpublished evidence, to:
 - Identify key groups and/or species of insect pollinators in the three main types of land use and establish their precise, essential needs.
 - Hold workshops in early 2014 to finalise these needs and to identify practical actions and measures to fulfil them.
 - Refine actions as appropriate evidence emerges.
12. This work will also take into account different species' contributions to pollination services and biodiversity priorities and will aim to represent the diversity of pollinating insects¹. As exact needs vary between the different groups and/or species of pollinators, practical actions are likely to be grouped as options such as 'Solitary bee nesting boxes' or 'Bumble bee shrub and flower mixes'. Our expectation is that actions taken to help the key groups and/or species of insect pollinators will also benefit the many hundreds of other pollinator species.

¹ This work will be coordinated with similar work to be undertaken as part of developing a coordinated monitoring programme on pollinators.

4. Further background on priority actions on pollinator-friendly management of farmland

Reform of the Common Agricultural Policy

13. The Status Report identified intensive agricultural land use as one of the multiple environmental pressures on pollinators and pollination services. The promotion of pollinator-friendly agricultural production is an important part of the National Pollinator Strategy, as the farmed environment makes up around 70% of England's land use.
14. The Common Agricultural Policy (CAP) provides opportunities for improving environmental management of farmland. The Government's existing CAP policies include promoting the uptake of pollinator-friendly options in agri-environment schemes. There is some evidence that these schemes are supporting greater diversity and abundance of wild pollinators. Options in current stewardship agreements cover 150,000 ha including buffer strips, pollen and nectar mixtures, wild bird seed mixtures, hay meadows and wild flower areas. More options were introduced in January 2013 in Entry Level Stewardship designed to provide habitat and food for invertebrates including pollinators. These were: a supplement to add wild flowers to buffer strips and field corners; and options to create legume- and herb-rich swards. The latter is applicable to a wide range of lowland livestock farms, including dairy and cattle farms.
15. The agri-environment schemes sit well alongside initiatives taken by others such as the Cooperative and Buglife's ongoing work on Bee Roads to create a network of wild flower strips across the countryside, and Syngenta's Operation Pollinator which has led to 1500 ha of wild flower margins on arable land over the last few years.
16. The CAP is undergoing reform and moving from the final stages of EU negotiation and into the implementation phase. Following the recent public consultation (October to November 2013), the Government published its initial range of CAP reform decisions on 19 December 2013, and a second set of decisions and further information on 26 February. Further decisions will be taken shortly. The current direct payments scheme will continue throughout 2014, and Defra has also already set out its transition plan for Rural Development in England for 2014:
 - New Higher Level Stewardship (HLS) agri-environment agreements worth about £26m per year in total to participating farmers. That includes offering Higher Level Stewardship agreements to those with eligible expiring old style 'classic' agreements and new agreements for Sites of Special Scientific Interest, other high

priority cases and to meet Water Framework objectives including those related to Natura 2000 sites.

- Uplands and organic Entry Level Stewardship. We also plan to offer Entry Level Stewardship for land coming out of 'classic' schemes in 2014 that does not qualify for HLS. This will provide about £4m per year in total to participating farmers. This will ensure a smooth transition for areas that have been under environmental management for a long time.
- Catchment sensitive farming capital projects and advice to farmers of up to £14m, including for Water Framework Directive-related action on Natura 2000 sites.
- Up to £30m to fund the management of about 200,000 hectares of existing woodland and the creation of about 2,000 hectares of new woodland through the planting of four million trees in 2014/15.

17. Many elements of the new CAP will be similar to the current arrangements, with CAP retaining its two pillar structure:

1. Pillar I for direct payments to farmers and regulatory measures, such as the new Greening requirements; and,
2. Pillar II covering the new Rural Development Programme. This will include funding of incentivised farming and forestry environmental schemes.

Priority Actions 2 to 4

Priority Action 2: Ensure pollinators represent a key focus of CAP reform.

18. Against this background of significant change and the complex regulatory environment in this sector, the Strategy's proposed actions on encouraging pollinator-friendly farming will take into account the CAP reform programme and its timetable. The Strategy seeks to encourage farmers to integrate pollinator needs into their farming practices as far as practicable. Government will work with a range of organisations to achieve this, coordinating and aligning efforts to achieve greater engagement from farmers.

19. The recent public consultation on implementing CAP reform in England led to a number of suggestions on how Greening requirements could be enhanced by voluntary action, particularly through the Campaign for the Farmed Environment, to benefit pollinators. We are exploring these issues further with stakeholders and Ministers are expected to take decisions shortly on the exact approach we will take to Greening in England.

20. The new environmental land management scheme to be funded under CAP Pillar II will build on the current agri-environment and woodland schemes, becoming more targeted. They will focus on key environmental themes and aim to operate on valuable sites and at a landscape scale. Natural England is advising on the combinations of options which, if implemented together, can best help pollinator needs. The Forestry Commission and Natural England are looking at how best to include pollinator-relevant actions for woodland management and planting. The Government's recent public consultation on CAP reform also considered the shape and structure of the new scheme.
21. The Government's response to the consultation and further CAP reform decisions on (26 February) included an outline of the new environmental land management scheme. Key features of the scheme include biodiversity as a priority and an aim for the agreements to operate across the wider countryside (rather than being site specific) to ensure buffer strips and establish stepping stones between habitats and ecological corridors. This approach recognises that landscape scale agreements are necessary to generate the critical mass of habitats or features necessary for providing resources for pollinators. The Government will continue to work closely with stakeholders and partners to ensure the new scheme is implemented effectively and practicably to deliver environmental objectives and ready for applications in 2015.

Priority Action 3: Secure commitment from farm advice providers to draw on 'Call to Action' package.

22. There are many different advice sources available to farmers, often focusing on different issues and objectives, and, as such, effort must be made to achieve consistent, effective messaging which engages farmers. It is a key aim of Campaign for the Farmed Environment (CFE)² and others to facilitate this consistency, and therefore integrating new priorities into existing advice structures can only be achieved successfully through cooperation and considered timing.
23. The CFE is an important source of advice for farmers. It brings together key industry initiatives as part of a voluntary approach in partnership with Government to improve the delivery of environmental outcomes on farms. Under the CAP, CFE has promoted uptake of Environmental Stewardship, providing free training and advice. It also encouraged proactive environmental management by targeting option choice towards the more beneficial in-field options, whilst promoting additional voluntary measures.

² The CFE is an industry-led partnership currently receiving some funding from Government, in addition to industry support. It involves the main farming and farm advisory organisations and also key environmental groups (Wildlife Trusts, RSPB, the Game and Wildlife Conservation Trust).

This included agri-environment options and voluntary measures for planting of wild flower mixes beneficial to pollinating insects.

24. Our aim is for the 'Call to Action' for bees and other pollinators to be promoted by all key advice sources as a simple message to offer to farmers on how to support pollinators. It will take time to fully integrate new advice on measures to take for the 'Call to Action' into existing advice strategies. Defra will continue to work with CFE, NFU, the Farming Advice Service, CLA and others to make sure that the 'Call to Action' is integrated into advice for farmers in the right way, at the right time.
25. We will also aim to work with others such as the Agricultural Industries Confederation to make sure that agronomists, agricultural and horticultural colleges are promoting pollinator-friendly farming to farmers and growers, covering conventional and organic practices. We are also exploring how best to ensure that knowledge is shared throughout the farming community as new evidence on pollinators is published. There are many existing networks which aim to facilitate this type of knowledge share and we will work with these initiatives to consider the best route to take to promote knowledge sharing for the farming sector.

Priority Action 4: CFE to develop a programme of pollinator events on farm.

26. CFE will develop a programme of pollinator-based events, potentially including farm walks, advisor training and will also produce a pollinator leaflet³ to encourage farmers to take action before pollinators are active in 2014. Government will work with CFE to help ensure the initial messages received by farmers during this programme will be consistent with current and future messages of the National Pollinator Strategy.

5. Further background on priority actions on integrated pest management

27. Policies on integrated pest management (IPM) and the sustainable use of pesticides sit alongside a tough regulatory regime governed by EU law to ensure that potential harmful effects from pesticides on human health and unacceptable effects to the environment do not occur.

³ New leaflet for 2014 - 'Pollinator management for your farm business'.

28. The regulatory regime recognises that pesticides deliver substantial benefits for society, for example plentiful and affordable food, but that the potential risks from pesticides need to be carefully managed. The regime is based on the evaluation of comprehensive scientific data to enable the assessment of risks. The system considers new evidence as it emerges and the approach to risk assessment can also be updated as knowledge develops. The EU risk assessment process for bee species is currently being updated.
29. Integrated Pest Management is a toolkit for combining effective crop protection with a full awareness of potential environmental impacts. Although it is helpful to set an overall structure, IPM needs to be considered and tailored on an individual basis. It is therefore not particularly meaningful to say that one farmer has adopted IPM and another has not. Nevertheless, Defra will assess progress with the uptake of IPM by farmers and growers, drawing on the knowledge of the Voluntary Initiative⁴ and also assurance schemes which are pursuing the development of IPM plans by farmers and growers.

Evidence on impacts of integrated pest management on biodiversity

30. Assessing the impact of IPM on biodiversity presents challenges given that it is a toolkit which can be used in different ways by farmers and growers. In addition, attributing changes in biodiversity to specific management practices is difficult due to the confounding effects of other factors. However, even with these challenges, available evidence suggests that changes in management practices, such as reduction in agro-chemical inputs, have positive effects on biodiversity. This implies potential benefits for pollinators too. Three examples of mainly qualitative evidence are set out below.

(1) English Nature Research Report 634 - Integrated farming and biodiversity (2005). P. Berry, S. Ogilvy and S. Gardner, ADAS

31. The aim of this report was to provide English Nature (now Natural England) with scientifically robust information on the impacts of integrated farming systems (IFM) on biodiversity. For the purposes of the report, a farming system was defined as using IFM if agro-chemical inputs were reduced compared with conventional systems. Biodiversity was defined as an increase in both the number of individuals within a species and/or an increase in the number of species within the experimental areas tested. The report only included effects on biodiversity if they were statistically significant at the 95% level.

⁴ The Voluntary Initiative was set up in 2001 and is an industry-sponsored programme of measures promoting responsible pesticide use.

32. The report reviewed 11 European studies which compared biodiversity under an IFM system with a conventionally managed system. Nine studies were all arable and two were mixed. The IFM systems included reductions in use of nitrogen, herbicides, fungicides and insecticides/molluscicides compared with conventional farming. In addition, 60 peer reviewed papers and technical reports on IFM and biodiversity were reviewed.
33. The 11 studies showed that IFM in arable and mixed farms could cause a statistically significant increase in the biodiversity of plants, soil microflora, non-target arthropods, earthworms, birds and small mammals. None of the studies showed that IFM reduced biodiversity. The majority of the improvements in biodiversity were achieved by increasing the populations of existing species, apart from the number of plant species in one study and earthworm species in another study. IFM increased weed numbers above the economic threshold in some studies, but other pests were not problematic.
34. The authors reported that it was not possible to attribute many of the biodiversity changes to specific management practices due to the confounding effects of other factors. They noted that this was an inherent problem of system comparison studies. The few instances when specific management practices were tested directly with experiments and literature driven hypotheses indicate that minimum cultivations, reduced herbicides and reduced insecticides (such as methiocarb slug pellets) had positive effects on biodiversity. The authors also noted that extrapolating these observations to a landscape scale was not straightforward due to the flexibility with which management practices can be used within an 'IFM system'.

(2) Enhancing arable biodiversity – six practical solutions for farmers (2007).

35. From 2001 to 2006, the Sustainable Arable Farming For an Improved Environment (SAFFIE) project aimed to develop and assess new ways to enhance biodiversity in winter cereals. These crops account for nearly half of UK arable land. The aim was to improve biodiversity and wildlife access within both field margins and crop. Novel management approaches were tested to improve food and habitat for a range of species important to UK farmland biodiversity.
36. The SAFFIE project was sponsored by Defra, the Scottish Executive Environment and Rural Affairs Department (SEERAD) and Natural England (formerly English Nature), through the Sustainable Arable LINK programme. The industrial funders were: Agricultural Industries Confederation, British Potato Council, Crop Protection Association, Home-Grown Cereals Authority Jonathan Tipples (farmer), Linking Environment and Farming, Royal Society for the Protection of Birds, Sainsbury's

Supermarkets Ltd, Syngenta, The National Trust, and Wm Morrison Supermarkets PLC.

37. One of the issues considered by the project was on the use of herbicides and this led to one of the project's six practical solutions for farmers. Specifically, the project recommended that using herbicides selectively in the spring would leave desirable species of weeds behind providing valuable food and habitat for insects and birds leading to benefits for biodiversity.

(3) The Benefits of LEAF Membership: a qualitative study to understand the added value that LEAF brings to its farmer members (2010). J. Mills, N. Lewis and J. Dwyer, Countryside and Community Research Institute

38. Some 2% of LEAF's 1600 members across the UK were interviewed in-depth and using a semi-structured questionnaire in September and October 2010. The report includes examples of responses from members. For example, some members reported that LEAF's Integrated Farm Management principles, have had a positive impact on biodiversity on their farms, including significant increase in bumble bees, particularly on clover flowers in our grazing paddocks, as well as beetles, grasshoppers, moths and other insects in field margins.

Current policies and initiatives

39. One element of the UK's strict regulatory regime on the sale and use of pesticides, is a Code of Practice to help farmers, growers and suppliers understand how they can comply with their legal obligations and follow good practice. The current Code includes measures to minimise the risk to pollinators from the use of pesticides. Following the implementation of the EU Directive on the sustainable use of pesticides into UK law, the Health and Safety Executive, on behalf of Defra, is reviewing this Code of Practice and aims to publish in 2014. The updated version will include renewed emphasis on the importance of minimising risks to pollinators. It will support the role that suppliers and advisers have in informing farmers of the steps they should take and the importance of taking full account of the information on product labels and the manufacturers' Environmental Information Sheets.
40. Integrated Pest Management does not prohibit pesticide use but draws on a full range of tools and techniques to control pests, weeds and diseases, ensuring targeted use of pesticides to minimise risks to the environment. The Strategy's proposed actions build on Defra's current policies and plans on IPM and the sustainable use of pesticides, giving them an increased focus on pollinators. Current policies and initiatives include:

- Implementation of Directive 2009/128 (establishing a framework for Community action to achieve the sustainable use of pesticides), which requires Member States to encourage and support uptake of IPM, including publication of a National Action Plan on pesticides;
- Ensuring that the general principles of IPM are implemented by all professional pesticide users by 1 January 2014;
- Working with training providers (such as City & Guilds) and BASIS to ensure that all training and continuous professional development courses for agronomists includes advice on integrated approaches. All users of professional pesticides have to be trained and hold the relevant certificate of competence or work under the supervision of a certificate holder. Only courses which provide training on integrated approaches will receive accreditation. Training requirements also apply for advisors. All advisors must be suitably qualified and BASIS Professional Register members. This is a requirement of the UK Crop Assurance Schemes, which cover the majority of crops grown in the UK.
- Encouraging development of biopesticides through research and development a special Biopesticides Scheme. Biopesticides are important in IPM but may be more expensive and less effective than conventional chemical pesticides. They also tend to be specific in their action and so a given product will only address a small market. Ten biopesticide active substances have been approved since the Scheme started in 2006.
- Funding of research and development to provide the scientific basis to enable industry to develop further measures for integrated or biological control in arable and horticultural commodities. This will encourage sustainable crop protection and also potentially benefit other systems like organic production. Technologies being developed for controlling insect pests typically involve disruption of natural processes of feeding, reproduction and development, as well as work on alternative control methods. Other work involves more specific targeting of pesticides to the problem being controlled.
- Supporting the work of industry stakeholders to develop an IPM self-assessment tool for farmers and growers ("IPM Plan" - a natural extension of the existing Crop Protection Management Plan). This continuous 'awareness raising' will encourage producers to look into using new approaches as they develop their knowledge of IPM tools and techniques such as decision support systems and pest and disease monitoring systems. This tool will be rolled out through the Voluntary Initiative.

41. A range of non-regulatory initiatives and incentives are also seeking to improve uptake of IPM:

- Assured Food Standards Schemes require growers to adopt practices which are consistent with the general principles of IPM. Specific standards are set for individual crops. Assurance schemes are a strong driver for uptake of particular standards. Retailers may add additional requirements of their own or may adopt even more demanding systems such as the LEAF Marque. Assurance schemes for livestock do not currently carry standards for pesticide use, although this remains under discussion. While this sector is not the main users of pesticides, there might be implications for pollinators arising from herbicide use to minimise weeds.
- The Amenity Forum is developing guidance on the use of integrated approaches within the different parts of the amenity sector. The IPM tool will also be developed in a way which enables use by amenity pesticide users.
- In woodland, initiatives such as the UK Woodland Assurance Scheme and the Forestry Commission's Practical Guide to Reducing Pesticide Use in Forestry promote practices consistent with the aims of the Directive and national policy, but specifically require owners/managers to implement effective IPM strategies.

Directive 2009/128 establishing a framework for Community action to achieve the sustainable use of pesticides

42. Annex III of this Directive includes the following general principles of integrated pest management.

‘1. The prevention and/or suppression of harmful organisms should be achieved or supported among other options especially by:

- crop rotation,
- use of adequate cultivation techniques (e.g. stale seedbed technique, sowing dates and densities, under-sowing, conservation tillage, pruning and direct sowing),
- use, where appropriate, of resistant/tolerant cultivars and standard/certified seed and planting material,
- use of balanced fertilisation, liming and irrigation/drainage practices,
- preventing the spreading of harmful organisms by hygiene measures (e.g. by regular cleansing of machinery and equipment),
- protection and enhancement of important beneficial organisms, e.g. by adequate plant protection measures or the utilisation of ecological infrastructures inside and outside production sites.

2. Harmful organisms must be monitored by adequate methods and tools, where available. Such adequate tools should include observations in the field as well as scientifically sound warning, forecasting and early diagnosis systems, where feasible, as well as the use of advice from professionally qualified advisors.
3. Based on the results of the monitoring the professional user has to decide whether and when to apply plant protection measures. Robust and scientifically sound threshold values are essential components for decision making. For harmful organisms threshold levels defined for the region, specific areas, crops and particular climatic conditions must be taken into account before treatments, where feasible.
4. Sustainable biological, physical and other non-chemical methods must be preferred to chemical methods if they provide satisfactory pest control.
5. The pesticides applied shall be as specific as possible for the target and shall have the least side effects on human health, non-target organisms and the environment.
6. The professional user should keep the use of pesticides and other forms of intervention to levels that are necessary, e.g. by reduced doses, reduced application frequency or partial applications, considering that the level of risk in vegetation is acceptable and they do not increase the risk for development of resistance in populations of harmful organisms.
7. Where the risk of resistance against a plant protection measure is known and where the level of harmful organisms requires repeated application of pesticides to the crops, available anti-resistance strategies should be applied to maintain the effectiveness of the products. This may include the use of multiple pesticides with different modes of action.
8. Based on the records on the use of pesticides and on the monitoring of harmful organisms the professional user should check the success of the applied plant protection measures.'

Priority Actions 5 to 7

Priority Action 5: Updated IPM guidance issued by LEAF, the Voluntary Initiative and the Agricultural and Horticultural Development Board (AHDB).

43. This will include how to apply IPM to specific crops and production methods with a particular focus on crops which are attractive to pollinators such as oil seed rape,

orchard fruits, field beans and peas. It will draw on published research and include case studies setting out on-farm examples and economic benefits drawn from conventional and organic farming. It will complement and feed into LEAF's new integrated farm management training syllabus. The guidance will be updated again in future years in the light of new research results and the development of the IPM toolbox to ensure that it continues to reflect good practice, including for the benefit of pollinators.

44. LEAF, the Voluntary Initiative and the Agricultural and Horticultural Development Board (AHDB) will ensure effective distribution of the updated advice to farmers through multiple channels including agricultural advisers, agronomists, agricultural colleges and BASIS Registration Ltd (an independent standards-setting and auditing organisation for the pesticide, fertiliser and allied industries).

Priority Action 6: (1) Revised guidance by the Voluntary Initiative on insecticide best practice; and (2) revised training courses run by the National Register of Sprayer Operators to include more detailed coverage on the responsible use of insecticides

45. The Voluntary Initiative is the main source of advice and information to farmers about pesticide use and IPM, and will revise its guidance on insecticide best practice to include risks to pollinators. The National Register of Sprayer Operators has 21,000 members and runs an annual course for operators which is attended by about 50% of its members. In revising their course, the aim would be to include more details on the responsible use of insecticides and on minimising risks to pollinators.

Priority Action 7: Facilitate increased sharing of IPM practices with other farmers on the management of crops which are attractive to pollinators.

46. Defra will work with the CFE, LEAF, AHDB, the Voluntary Initiative and others to explore how to expand the sharing of IPM practices with other farmers on the management of crops which are attractive to pollinators. Sharing would be through case studies, articles in the farming press, demonstration farms, farm walks or on-farm workshops. While the main focus of this improved sharing will be on IPM for pollinator-relevant crops, alternative crop production methods such as organic farming will also be considered.
47. For example LEAF works with 43 demonstration farms committed to sustainable farming practices; these farms are open throughout the year for booked visits so that farmers can see integrated farm management in practice and learn about the impacts on costs and benefits.

48. As part of their offer to the Strategy, LEAF Farms and Syngenta's Jealott's Hill Farm have agreed to work with farmers and horticultural growers to promote IPM with a particular focus in pollinator-relevant crops. Uptake of IPM is an integral part of the LEAF Marque standard system which also specifies farms applying for the Marque should have bees and other pollinators as key species in their whole farm conservation plans.

6. Further background on proposals on pollinator-friendly management of towns, cities and public land

49. The Status Report identified urbanisation and land use as one of the multiple environmental pressures on pollinators and pollination services. Loss of semi-natural habitat by urban and suburban development over many years has had negative impacts on biodiversity and has reduced the availability of essential resources for pollinators – pollen and nectar food sources and suitable sites for nesting and shelter. Some parts of the urban landscape are ecological deserts where pollinators (and other wildlife) cannot thrive, exacerbated by planting of low maintenance plants and flowers which are devoid of pollen and nectar.

50. Urban and suburban landscapes provide a range of different habitats which all have the potential to provide numerous nesting sites, shelter and floral food sources for pollinators as well as plants for feeding on during different life stages, such as caterpillars (the larvae of butterflies and moths which feed on, or shelter in herbaceous plants, like dandelions and clover or to shrubs and trees). These different habitats include parks, playing fields, gardens, allotments, derelict sites, brownfield sites, cemeteries, car parks, school grounds, and land around offices and other buildings.

51. Other types of land use in urban settings and further afield also provide important opportunities for pollinators. In particular, transport and other infrastructure, such as road verges, roundabouts, land beside railway lines, and flood defences.

Priority Actions 8 to 14

Priority Action 8: Secure commitment from large-scale land managers to follow 'Call to Action' advice.

52. The 'Call to Action' message (once agreed) and underlying evidence-based recommendations and advice provide the starting point for action. This advice will be applicable to local planners, developers, facilities managers, park managers,

professional or amateur gardeners, allotment holders, landscape architects, transport operators, flood defence managers, property developers and estate managers in the public or private sector amongst others. In addition retailers, businesses, trainers of land managers and the media have an important role in cascading and actively promoting the 'Call to Action' package to all land managers, including amateur gardeners.

53. Defra seeks to expand the list of organisations which have already committed to pollinator-friendly management by the time the Strategy is published in summer 2014 after the public consultation, and also during implementation. In addition, Defra will ensure that Local Nature Partnerships and Nature Improvement Area partners have access to the 'Call to Action' package to encourage them to promote best practice for pollinators at a local level.

Priority Action 9: Disseminate 'Call to Action' advice to brownfield site managers.

54. Defra is currently working to improve biodiversity recognition and opportunities on brown field sites, and in particular of Open Mosaic Habitats (OMH) and the biodiversity interest supported by these sites. As part of the action to support pollinators on brownfield sites, Defra will also seek engagement with Natural England to provide guidance for surveyors and local authorities to update the new OMH inventory, so that this habitat type and its biodiversity interest are increasingly recognised.

55. As well as supporting pollinators, appropriate planting of brownfield sites offers a potentially low cost approach to remediating⁵ the site and may increase its ecological and commercial value.

Priority Action 10: Policy and practice note on urban pollinators produced and disseminated as part of Insect Pollinators Initiative.

56. The IPI Programme Management Group (BBSRC, NERC, Defra, Scottish Government and the Wellcome Trust) are currently planning dissemination activities for the nine projects funded under this initiative which are due to be completed in 2014/15. This will include a dissemination event in autumn 2014 and the publication of policy and practice notes to turn the scientific findings into practical actions for land managers to improve the outcomes for pollinators. Provisional results from this initiative suggest that gardens and allotments are crucial habitats for pollinators in cities and hence a key audience for the best practice note on urban pollinators will be householders and allotment holders.

⁵ Phytoremediation - the use of plants for cleaning up contaminants such as heavy metals in soils and other media

57. The Programme Management Group will coordinate its dissemination plans with others, including NGOs such as the Bumblebee Conservation Trust (BBCT) which is keen to maximise local dissemination opportunities for the policy and practice note on urban pollinators. The BBCT is considering running a conference on this when the note is published. In addition the British Beekeepers Association has a number of planned initiatives to help dissemination of the IPI results such as at their annual Spring Convention in April 2014.

Priority Action 11: Integration of 'Call to Action' advice into local biodiversity initiatives.

58. Defra, DCLG and Natural England are exploring a range of initiatives to improve local biodiversity. For example biodiversity off-setting (in development), the Green Infrastructure Partnership and the Green Flag award scheme for parks and green spaces. Our aim is to extend the scope of the existing guidance supporting these initiatives to include advice on pollinator friendly planting and habitats. We will also cascade the Call to Action package (when ready) to practitioners in these sectors. As part of this, the Friends of the Earth will look at ways to reach local authority planners and share good practice including through the Town and Country Planning Association eco-development group.

59. Launched in 1996 the Green Flag Award Scheme is the national benchmark for quality public green spaces such as parks and community gardens. It is highly regarded and recognised and used by the majority of local authority green space managers and increasingly by community and voluntary groups. There is also a commitment to continued support for the scheme in England's Natural Environment White Paper (2011). In 2013, 1,500 applications for Green Flag (including Green Flag Community Award) were made and 1,452 parks and other green space sites are now successfully flying a Green Flag or Green Flag Community Award. The scheme is managed under licence from DCLG by Keep Britain Tidy.

60. Subject to ongoing business planning processes, Natural England will continue to offer advice to Keep Britain Tidy about how the Green Flag Award Scheme might achieve more for the environment, including for pollinators. Natural England will revise their Biodiversity Advice Pack to include the Call to Action advice on pollinators. This Pack is used by Green Flag judges and applicants, and is also applied informally by local authorities, such as Southampton City Council to informally assess parks at a local level.

Priority Action 12: Develop pollinator best practice awards and/or competitions.

61. Royal Horticultural Society (RHS) Britain in Bloom is looking at the potential to introduce a pollinator-directed award and to adjust the guidelines in certain existing awards and themes to promote pollinator-friendly planting. RHS is planning a pollinator-friendly theme for the 2014 Bloom campaign – ‘Growing for Gold’ which will focus on golden/yellow RHS Perfect for Pollinators plants. This UK-wide community gardening campaign covers communities and other groups working alone or with others and local authorities.
62. An important aspect of pollinator-focused awards would be longer term planting with native flowers and shrubs to provide pollen and nectar sources throughout the year and potential nest sites in the design. In addition, the use of native plants would be a source of food for the various life stages of some pollinators eg, caterpillars (whereas non-native plants may not be useful food sources for caterpillars).
63. We are looking to identify other potential partners to work with to develop awards and competitions on pollinator best practice.

Priority Action 13: Develop pesticide guidance for amenity managers.

64. Defra and HSE’s Chemical Regulation Directorate (CRD) are working with the Amenity Forum to develop appropriate guidance in and to encourage the use of trained advisers in this sector and uptake of the Amenity Assured Scheme which sets standards of best practice and is open to contractors to join.
65. Advice for gardeners on the responsible use of pesticides including on disposal and on minimising use, is provided on CRD’s website.
<http://www.pesticides.gov.uk/guidance/industries/pesticides/user-areas/gardenhome#Alternatives>

Priority Action 14: Develop quality standard to ensure availability of high quality native origin seeds for wildflower planting schemes.

66. The Royal Botanic Gardens Kew, through its UK Native Seed Hub and Millennium Seed Bank, is committed to working with the UK native plant materials industry to raise standards of quality, traceable origin and responsible collection, production and use. A priority has been to ensure Kew’s own native seed products reach the highest standards, and Kew are expanding this work to provide advice to UK producers, land managers and conservation organisations on how seed quality can be improved through best practice collecting of wild seeds, processing, testing and storage. This is

largely driven by recent unpublished studies carried out by the Seed Bank which show that the viability of commercially available wild flower seed can be highly variable.

67. As part of this emerging voluntary standard for wild flower seeds, seed companies would be able to send their wild flower seed to the Millennium Seed Bank or another competent seed testing laboratory for confirmation of viability.
68. As an alternative to using seeds for wildflower planting schemes, land managers in the UK can also purchase wild flower turf which is ready to lay and includes mixtures of UK native wild flowers and grasses.

7. Further background on proposals on responding to pest and disease risks

69. We have a good understanding of pest and disease risks in honey bees and long term trends on infection rates in colonies across England (and Wales) as a result of the National Bee Unit's (NBU) honey bee colony inspection programme. We do not have a similar level of understanding of pests and diseases risks and trends in the many other pollinator species. The Status Report sets out the pest and disease risks of honey bees and these risks were also covered in detail in Defra's 2012 review of policies to control pest and disease risks of honey bees
<https://www.gov.uk/government/consultations/improving-honey-bee-health>.

70. The Government has had regulations since the 1940s to control two bacterial honey bee brood diseases – American Foulbrood and European Foulbrood – which were widespread at that time in the UK. These controls and associated honey bee health programme have evolved since then. They now focus on beekeepers notifying suspect cases of notifiable pests and diseases to Government, granting authority to NBU bee inspectors undertaking a risk based colony inspection programme with authority to destroy or treat infected colonies and impose movement restrictions. These controls have been effective leading to a significantly reduced incidence of these two diseases since the 1940s down to very low current levels (1-2% of colonies inspected). This was confirmed by the random apiary survey of honey bee pests and diseases commissioned by Defra in 2009 and undertaken by the NBU⁶.

71. The honey bee health legislation was extended in the 1980s to include the *Varroa* mite as a notifiable pest. However, following its establishment and spread in the 1990s, it

⁶ The NBU carried out this survey from 2009 to 2011 by visiting and taking samples from around 5000 apiaries selected at random from BeeBase, their database of beekeepers in England and Wales.

was deregulated in 2006. At the same time two new potential threats to EU, the small hive beetle (*Aethina tumida*) and *Tropilaelaps* mites, were made notifiable pests under the 2006 legislation. Although *Varroa* is no longer notifiable, the Government's bee health programme continues to provide advice and training on its management.

Priority Actions 15 and 16

Priority Action 15: Improvement of beekeepers' management of pest and disease risks of honey bees through the Healthy Bees Plan.

72. Defra's honey bee health programme was expanded in 2009 by publication and implementation of the 10 year Healthy Bees Plan in England and Wales. The Plan confirms the Government's ongoing commitment to protect and improve the health of honey bees, and to work in partnership with beekeepers to ensure that both current and evolving threats to bee health, such as the small hive beetle, *Tropilaelaps* mites, and the Asian hornet, are effectively identified, assessed and acted upon. It includes jointly-funded education and training initiatives to improve beekeepers' skills to manage their colonies and reduce losses from pest and disease risks particularly the *Varroa* mite.

Priority Action 16: Implement revised policies to control pest and disease risks of honey bees.

73. The revised policies include the NBU's bee inspectors, beekeeping associations and the National Diploma in Beekeeping raising the profile of the *Varroa* mite (through inspectors' visits to beekeepers and providing specific advice on up-to-date effective control methods) and agreeing a rolling coordinated training programme. The NBU will also continue to provide specific advice to beekeepers on preparing their bees for the winter to reduce the risk of winter colony losses. The policies also put greater emphasis on improving the preparedness of the NBU, inspectors and beekeepers to deal with the arrival of exotic pests such as the Asian hornet. For example, Defra's Response Plan for the Asian hornet will be updated in the light of lessons (to be) learned from the planned contingency exercise on this pest planned for February 2014.

8. Summary overview of insect monitoring and assessment in the UK

74. There are a number of organisations involved in insect monitoring in the UK, and the majority of data are collected by volunteers, often with considerable taxonomic expertise. These data are used to inform local and national decision making and so are

of significant interest to the research community, local and national Government. A range of funding streams and initiatives has developed, supported by these data users. Some key initiatives are outlined below.

Data collection

75. Most insect records are collected by **National Schemes and Societies** such as the Bees, Wasps and Ants Recording Society and the Hoverfly and Moth Recording Scheme. These schemes are operated by dedicated and skilled amateur naturalists and collect occurrence records (i.e. where a species occurs). A key output of their work has been the production of atlases, which show how insect species are distributed and how this distribution changes. They are generally self funded, although do receive some money from Government to support data verification and atlas publication (see below).
76. There are three main systematic surveys for insects in the UK, again primarily operated by volunteers: the Butterfly Monitoring Scheme, the Wider Countryside Butterfly Scheme and the Rothamsted Insect Survey (moths and aphids; the aphid survey being supported by Science and Advice for Scottish Agriculture). Funding for central coordination and data storage is provided by Government agencies such as Natural England, JNCC and Scottish Natural Heritage; and by the Research Councils.
77. Additional insect records are collated by **Local Record Centres**. These are charitable or not-for-profit organisations funded by partnerships of Local Authorities, Wildlife Trusts and Government agencies. They also receive some income for private organisations/consultancies for data and survey services. They often have networks of local volunteer recorders that they support.
78. There is some targeted monitoring of insects undertaken by statutory agencies, such as Natural England that supports reporting on SSSI and Habitats Directive. This has traditionally been around £1M per annum across all species including insects. There are also a number of nationwide surveys, funded by partnerships of Government and the Research Councils which record change in insect abundance or in the condition and extent of their habitats. Examples include **Countryside Survey** and the **Environmental Change Network**.

Data validation, verification and management

79. There is a tension between nationally collated and validated datasets and locally collated data sets held by a range of bodies. Many national specialist bodies are deterred from combining their data with that provided to the NBN gateway from local sources due to concerns about the accuracy and quality of the unvalidated data.

80. The primary national initiative for coordinating, managing and sharing species occurrence data to common standards is the **National Biodiversity Network (NBN)**, coordinated by the **NBN-Trust** and making data available through the **NBN-Gateway**. The NBN-Trust and Gateway is funded by a consortium of Government agencies and voluntary bodies, with significant additional funding from central Government to establish the network and IT infrastructure. Much of the current investment is aimed at supporting a single data infrastructure, based on on-line recording and automated verification and validation (previous reliance on local data management resulted in duplication of both effort and records).
81. The Biological Record Centre and the Centre for Ecology and Hydrology, using Heritage Lottery funding, has developed a range of on-line tools, known as Indicia⁷ which facilitate on-line recording. They have also developed on-line verification and validation tools that can automatically filter for unusual records that require verification and can automatically flag and pass on records requiring expert validation to the relevant experts quickly and once only.
82. Abundance data from systematic voluntary schemes or from nationwide surveys such as CS and ECN, are generally stored separately but made available through dedicated websites supported by the Research Council and/or the relevant voluntary organisation.

Data analysis and publication

83. The **Biological Record Centre (BRC)** was established in 1964, to provide a national focus for terrestrial and freshwater biodiversity recording in the UK. It is currently funded by a partnership of the Natural Environment Research Council and JNCC (which is funded by the UK Government and each of the UK Devolved Administrations). The BRC provides technical support to over 80 volunteer recording societies, assisting in the management of data and publication of atlases. It is also developing and testing new modelling approaches for trend assessment from biodiversity occurrence data, and making these methods and tools available to the scientific community. It also currently receives direct funding from Defra to promote and enable recording of non-native species and to pilot and test new, with volunteer societies more structured and systematic approaches to recording.

⁷ <http://www.indicia.org.uk/>

84. Some of the larger voluntary groups, such as **Butterfly Conservation** publish their own distribution, abundance and trend assessments via their own website:
www.butterfly-conservation.org/