STEP

Status and Trends of European Pollinators

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STEP

Deliverable 4.1:

Review of the uptake of mitigation strategies counteracting pollinator loss across Europe

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NON TECHNICAL SUMMARY

This report summarizes the uptake of available mitigation measures to counteract loss of pollinators across Europe. The information was gathered from databases and by approaching national contacts on the subject in a majority of the European countries.

Three types of mitigation measures which may provide forage and breeding resources to pollinators were identified: (i) protected areas; (ii) agri-environment schemes; and, (iii) mass-flowering crops. Habitat protection is important to provide permanent habitat, and in Europe 13% of the terrestrial area is protected. However, only a smaller part of this area may be suitable habitat for pollinators, as protected areas are primarily designated for other taxa (e.g. plants or birds) and rarely for pollinators per se, and may not meet the ecological requirements of pollinators. Creation and restoration of semi-natural habitats, establishment of flower strips and reduction of pesticide inputs by conversion to organic farming or introduction of unsprayed field margins are measures that are part of national agri-environment programmes in Europe and may promote pollinators. Organic farming, one common measure, covers 4% of the agricultural land in Europe. Flowering crops can provide abundant forage resources for a short time period during the year, and such crops cover 7% of European agricultural land.

POLICY RELEVANCE

This report provides information on three general approaches which can (potentially) help mitigate against pollinator loss. These include agri-environment schemes, mass flowering crops and protected areas.

The uptake of agri-environment scheme options within Europe that are potentially beneficial for pollinators are highly variable. There are differences in both national uptake of particular measures, such as organic farming, and in the national approaches to agri-environment scheme implementation. The aim of measures within national agri-environment schemes are often not to promote pollinators, but are targeted at wider biodiversity in general, or aim to reduce the negative influences of agriculture on the environment. Some agri-environment measures, however, have the potential to promote pollinators by increasing the availability or quality of foraging and breeding habitat. Such measures include protection, creation and restoration of semi-natural habitats, establishment of flower strips, planting of flowering trees and bushes, growing flowering crops, and reducing pesticide inputs by conversion to organic farming or introduction of unsprayed field margins. Different countries have taken different approaches in their agri-environment programme. For example, the UK includes very specific mitigation measure, including measures specifically targeting pollinators, while, the schemes are more general in, for instance, Finland and Estonia. Other countries, such as Germany and Sweden, have taken a middle way, which includes a mix of more general measures (such as environmentally friendly farming and organic farming) and an additional number of more specific measures (such as establishment of flower strips and biodiversity set-asides). To efficiently mitigate further pollinator declines, future mitigation measures that significantly enhance pollinators should be developed based on knowledge of the habitat requirement of pollinators and on the potential threats to pollinators. These could be specific and targeted or more general. General measures that add flower and nesting resources to the landscape

via more extensive land use or by set-asides appear to be efficient for pollinators.

Mass flowering crops can provide a brief spike of forage resources for some pollinators, but it not established whether they actually enhance local pollinator populations. However, they represent a potential tool, through modified cropping patterns, to support pollinators. The impacts of mass flowering crop could be widespread given that they comprise 7% of European agricultural area.

Most nationally important protected areas (e.g. Natura sites) are designated on the basis of conserving and protecting plants and birds (Birds and Habitats Directives) and are rarely designated specifically for pollinators. Many protected areas may incidentally provide good pollinator habitats (e.g. low input grasslands) but many may be poor for pollinators (e.g. coniferous woodland, lakes).

STEP Deliverable 4.1

Review of the uptake of mitigation strategies counteracting pollinator loss across Europe

SUMMARY

Recent research has shown declines of insect pollinators, such as bumble bees, solitary bees, hoverflies and butterflies, in Europe during the past century. The most important factor is probably the land use changes that have occurred in the agricultural landscape, with loss of semi-natural habitat and increased use of agrochemicals, resulting in loss of nesting and foraging resources. The specific aim of Task 4.1a is to report on the uptake of mitigation measures counteracting pollinator loss in Europe.

Three types of mitigation measures were identified by the working group of WP4; protected areas, agri-environment measures and mass-flowering crops. Protection of habitat is important because it provides permanent habitat. The proportion of protected terrestrial area is ~13% in Europe, though most of this area was not designated on the basis of pollinator conservation. Agri-environment measures that increase the availability of foraging and breeding habitat have the potential to promote pollinators. Such measures include creation and restoration of semi-natural habitats, establishment of flower strips, planting of flowering trees and bushes, reduction of pesticide inputs by conversion to organic farming or introduction of unsprayed field margins. Different versions of these measures are part of many national agri-environment programmes, although few measures are directly targeted at promoting pollinators. The uptake of one common measure, organic farming, range from 0 to 16% of the agricultural land in European countries, with an average of 4%. Different countries have taken different approaches for their agri-environment programme. For example, the UK includes very specific mitigation measure, including even specific measures targeting pollinators, while, the schemes are more general in both Finland and Estonia. Mass-flowering crops, which can provide abundant short-term forage resources, cover around 7% of the agricultural land in Europe, with sunflower seed and rapeseed as the dominating crops.

Few mitigation measures are specifically targeted at pollinators. Future mitigation measures that target pollinators should be developed based on knowledge of the habitat requirement of pollinators and on the potential threats to pollinators.

1. Introduction

Recent research has shown declines of insect pollinators, such as bumble bees, solitary bees, hoverflies and butterflies, in Europe during the past century (Berenbaum et al. 2006, Biesmeijer et al. 2006, Bommarco et al. in press). There are several reasons for the decreasing trend in pollinating insects (Potts et al. 2010). The most important factor is probably the land use changes that have occurred in the agricultural landscape after the Second World War (Winfree et al. 2009). Suitable habitats have been lost when the proportion of semi-natural areas have decreased, which has affected the pollinator fauna negatively (Kremen et al. 2004, Öckinger & Smith 2006). In addition intensified use of the agricultural land, with e.g. increased use of agrochemicals, has negatively affected pollinators (Rundlöf et al. 2008), as have the loss of both potential nesting sites and forage resources (Carvell et al. 2006). Other factors, such as pathogens, climate change and invasive species, may also contribute to pollinator declines (Potts et al. 2010). There is thus an urgent need to identify and implement mitigation measures that can halt the loss of pollinators and alleviate the negative effects that pollinators are influenced by in the agricultural landscape.

The overall aim in WP4 is to review, synthesize and understand the effectiveness of measures mitigating pollinator and pollination loss that have so far been implemented throughout Europe. The objective in Task 4.1 is to assess the availability of mitigation strategies for pollinator and pollination loss in Europe, and the specific aim of Task 4.1a is mitigation measures counteracting pollinator loss.

2. Uptake of mitigation measures

Measures that mitigate the loss of pollinators should prevent further loss of pollinator habitats, restore pollinator habitat or provide supporting resources (e.g. forage and nesting resources). The collection of data on the uptake of mitigation measures to counteract pollinator loss in Europe has been based on three steps.

First, the working group of WP4 identified two types of mitigation measures that may promote pollinators; protected terrestrial semi-natural areas and agri-environment schemes (e.g. field margin strips, organic farming, set-aside) (Scheper & Kleijn 2011). In addition, mass-flowering crops, which may provide abundant forage resources for flower visiting insects (Walther-Hellwig & Frankl 2000), was considered an additional potential mitigation measure.

Second, data on the identified potential mitigation measures were collected for as many European countries as possible from EUROSTAT and FAOSTAT. Data was available for national areas of protected terrestrial land (table 1), organically managed farmland (table 3) and mass-flowering crops (table 4).

Third, potential contact persons have been identified in most EU and some non-EU countries. These contact persons were selected based on their work on pollinator conservation or evaluations of biodiversity effects of mitigation measures. Several of the identified contact persons were participants in the STEP project or involved in other European projects related to pollinators (e.g. ALARM and AGRIPOPES). A questionnaire (see Appendices A and B) was sent out to the potential contact persons in 22 EU and 3 non-EU countries (Appendix C), asking for information on the national uptake (e.g. in hectares and/or in amount of subsidies spent per year) of measures that (potentially) mitigate pollinator loss in the country, or information on additional national contacts. Reminders were sent out if no response were received. Reports of different detail have been received from 15 of the approached countries (Appendices C and D1-9).

2.1. Protected terrestrial area

Habitat protection is viewed as one of the most important conservation measures. No specific studies have however shown that protected areas enhance or protect pollinator populations (Dicks et al. 2010). Protected areas in Europe, such as the Natura network, are primarily designated on the basis if the need to protect plants (Habitats Directive) or birds (Birds Directive) and are rarely designated for pollinators; though a few butterfly species are listed in Annex II of the Habitats Directive, in general in Europe butterflies are virtually unknown as pollinators of crops and make a very minor contribution to the pollination of most wild plant species (Potts et al. 2010). Protected semi-natural areas are rarely targeted at pollinators, but usually hold essential flower and nesting resources for pollinators and have been suggested as a source habitat for pollinators in the wider agricultural landscape (Öckinger & Smith 2006). Several studies have also shown that the local abundance and diversity of pollinators often increase with increasing proportion of semi-natural areas in the surrounding landscape (e.g. Steffan-Dewenter et al. 2002, Öckinger & Smith 2006, Ricketts et al. 2008, Rundlöf et al. 2008).

Just over 500,000 square kilometres of the terrestrial area in EU (EU-25) is protected, which amounts to 13% of the land area (table 1). The proportion of protected terrestrial land in the countries of the EU range from 7 to 31% (table 1). The countries with the largest proportions of protected terrestrial land are Slovenia (31%) and Spain (23%), and those with the lowest Cyprus, Denmark, Poland and the UK (all on 7%). These proportions however include all types of land uses, including those of small significance as pollinator habitat.

Table 1. *National areas and proportions of protected terrestrial land (Habitats Directive).*

Country or region		Protected terrestrial area (km^2) (1)	Percent (%) protected (2)
European Union (25 countries)	EU-25	500 873	13
Austria	EU	8 888	11
Belgium	EU	3 041	10
Cyprus	EU	661	7
Czech Republic	EU	7 244	9
Denmark	EU	3 177	7
Estonia	EU	7 474	17
Finland	EU	43 092	13
France	EU	46 564	8
Germany	EU	35 208	10
Greece	EU	21 643	16
Hungary	EU	13 929	15
Ireland	EU	7 175	10
Italy	EU	42 816	14
Latvia	EU	7 101	11
Lithuania	EU	6 493	10
Luxembourg	EU	399	15
Malta	EU	40	13
Netherlands	EU	3 485	8
Poland	EU	23 256	7
Portugal	EU	16 013	17
Slovakia	EU	5 739	12
Slovenia	EU	6 359	31
Spain	EU	118 165	23
Sweden	EU	56 934	14
United Kingdom	EU	15 978	7

(1) Protected terrestrial area (km2) 2007, Habitats Directive. Source: Eurostat.

(2) Percent protected terrestrial area 2007, Habitats Directive. Source: Eurostat.

2.2. Agri-environment measures

The European agri-environment measures are intended to limit the negative impact of agricultural production on the environment by providing financial incentives to farmers to for example reduce agrochemical input or create permanent habitat for wildlife (Kleijn and Sutherland 2003). Agri-environment measures are with few exceptions (e.g. in the UK, section 2.2.9. and Appendix D9) not aimed at promoting pollinators, but measures that increase pollinator nest and breeding site availability or quality or flower resource abundance or reduce direct mortality have the potential to promote pollinators. In table 2, five such measures, or groups of measures, have been summarized, based on the information provided on uptake of national agri-environment measures (Appendices D1-9).

Table 2. *Summary of agri-environment measures (AES) implemented in different European countries that have the potential to promote pollinators, based on information provided by national contacts (see Appendices C and D1-9).*

	Semi-natural grassland creation and restoration	Maintained semi-natural grassland management	Small biotop creation and restoration (e.g. uncultivated field borders, hedge rows, stone walls)	Creation of flower strips and fallows	Promotion of fruit and other flowering trees and bushes	Organic farming and unsprayed field margins
Examples of studies evaluating the AES	Pöyry et al. 2005, Öckinger et al. 2006, Lye et al. 2009	Öckinger & Smith 2006, Franzén & Nilsson 2008, Sjödin et al. 2008	Meek et al. 2002, Ivarsson & Pettersson 2005, Lye et al. 2009	Steffan-Dewenter & Tscharntke 2001, Pywell et al. 2006, Alanen et al. in press, Kuussaari et al. in press	Svensson 2002	Pywell et al. 2006, Rundlöf & Smith 2006, Holzschuh et al. 2007
Country						
Belgium				fabaceae	x	x
Czech Republic	x	x		biobelts		x
Estonia	mainly restoration	maintenance of semi-natural habitat	x	x		x
Finland	x	x	x	wild flower strips, environmental fallow	small forest patches within fields	x
Germany		x		x	management of hedges and mixed orchards	x
Greece						
Ireland		x		x	x	x
Netherlands	x	x	x	x	x	
Norway		meadows				x
Serbia					x	
Sweden	in special areas	x	x	in special areas		x
Switzerland		x		"pollinator initiative"	x	
United Kingdom		x	x	nectar and pollen mixtures, floristically enhanced grass margin	planting fruit trees, hedges	x

Creation and restoration of abandoned or intensively used semi-natural grasslands and small biotopes can both provide nesting and foraging habitat for pollinators (Svensson 2002, Öckinger & Smith 2006). The possibility to receive financial support to create or restore semi-natural grasslands occurs in around half of the countries that provided more detailed information on the uptake of national agri-environment measures (table 2). The continued

management regime of the grasslands is essential for the habitat quality, with generally higher habitat quality when management is done extensively, or even temporary abandoned, to allow higher vegetation and the plants to flower (Sjödin et al. 2008, Lye et al. 2009). Measures to maintain semi-natural grassland management is commonly occurring (table 2), but current measures generally promotes intensive rather than extensive management.

Establishment of flower strips and planting of flowering trees and bushes directly provide foraging resources that attract pollinators, but which group of pollinators that will benefit depend on the plant species used (Carreck & Williams 2002, Pywell et al. 2006). To promote a diversity of pollinators, a diversity of different types of plant species differing in morphology should be used. Fallows can provide both nest and forage resources depending on age and management, with increasing bee diversity with age of the fallow (Steffan-Dewenter & Tscharntke 2001). Finnish studies have shown that even short-term rotational fallows can be useful pollinator habitat (Kuussaari et al. in press), but that the value to pollinators increase with age (Alanen et al. in press). A variety of different agri-environment measures exist throughout the different countries to provide flower resources in strips or in fallows (table 2), of which some are directly targeted at pollinators, as in the UK. It is however important to remember that a majority of the studies evaluating the impact of measures on pollinators focus on foraging individuals, which only may indicate a redistribution of pollinators and not an influence on the pollinator populations.

Organically managed farmland appears to be a better pollinator habitat that conventionally managed farmland particularly in intensively farmed agricultural landscapes (e.g. Rundlöf & Smith 2006, Holzschuh et al. 2007, Rundlöf et al. 2008, Batáry et al. 2011). A probable reason is the prohibition of herbicides, which results in a higher abundance of flower resources on and adjacent to organically managed farmland (Holzschuh et al. 2007, Rundlöf et al. 2008). Another measure that limits the use of herbicides is unsprayed field margins or “conservation headlands”. Field margins that are left unsprayed with herbicides contain several times more flowers compared to conventionally sprayed field margins (Pywell et al. 2006). The conversion to organic farming however includes other management changes (e.g. Stockdale et al. 2001), and it cannot be concluded that the lack of pesticides in organic farming is the only factor influencing pollinators. Organic farming is part of the national agri-environment programs of all countries but the Netherlands of the once that provided more detailed information on the uptake of national agri-environment measures (table 2). In contrast to many other countries, the policy to support organic farming in the Netherlands is mainly targeted at the demand side of the market. Though organic farms may support more pollinators than conventional farms in some contexts, the fact that organic farms are on the whole less productive per unit area than conventional farms, means that to produce the same amount of food, which is highly relevant given food security concerns, organic farms need a higher coverage of area. If the additional area needed by organic farms replaces poor quality pollinator habits (e.g. intensive grasslands) then there will be a net advantage for

pollinators, but if the expanded area is at the expense of semi-natural habitats good for pollinators then there may be a net loss.

Incidences of honeybee poisoning by pesticides in three European countries, the UK, the Netherlands and Germany, appear to exhibit a decreasing trend since the 1980' (Thompson & Thorbahn 2009), and the trend is, although unknown, probably the same for wild pollinators. However, new types of pesticides are developed and in combination with other factors these could have significant sub-lethal and lethal effect on pollinators (e.g. Alaux et al. 2010). Measures that aim at reducing the use of pesticides, such as organic farming or IPM (Integrated Pest Management) regimes, have the potential to reduce such risks and these measures may become increasingly important in the future (Mänd et al. 2010).

As organic farming limits the input of agrochemicals, the proportion of the agricultural land managed organically can be used as an indication of how intensified the national agricultural practice is in different European countries. The proportion of organically managed farmland of the utilized agricultural area range from 0 to 16%, with an average of 4% in EU-27 (table 3). The highest proportions of organic farming are found in Austria (16 %) and Cyprus (15 %), and the lowest ones in Bulgaria and Malta (both 0 %) (table 3).

Table 3. *National areas and proportions of organically managed farmland of the utilized agricultural area (UAA).*

Country or region		Organically managed area (ha) (1)	Percent (%) organic of UAA (2)
European Union (27 countries)	EU-27	7 764 722	4
Austria	EU	2	16
Belgium	EU	36 153	3
Bulgaria	EU	16 663	0
Cyprus	EU	23 223	15
Czech Republic	EU	320 311	9
Denmark	EU	150 104	6
Estonia	EU	87 346	11
Finland	EU	150 374	7
France	EU	583 799	2
Germany	EU	907 786	5
Greece	EU	317 824	8
Hungary	EU	122 817	2
Ireland	EU	42 816	1
Italy	EU	1 002 414	8
Latvia	EU	161 624	9
Lithuania	EU	122 200	5
Luxembourg	EU	3 535	3
Malta	EU	20	0
Netherlands	EU	50 434	3
Poland	EU	313 944	2
Portugal	EU	233 475	6

Romania	EU	140 132	1
Slovakia	EU	140 755	7
Slovenia	EU	29 836	6
Spain	EU	1 317 539	5
Sweden	EU	336 439	11
United Kingdom	EU	726 381	4
Norway	non-EU	52 248	:

: data not available

(1) Total organic area (fully converted and under conversion) 2008 (ha). Malta - data 2006, Cyprus and Portugal - data 2007. Source: Eurostat (food_in_porg1).

(2) UAA, data for 2008 (data taken out from Eurostat April 2010).

Following are national reports on the uptake, in area, length or economic support, of agri-environment measures that potentially can mitigate the loss of pollinators in different European countries.

2.2.1. Belgium

The annual uptake of agri-environment schemes in Belgium during 2005-2007 was around 120 000 ha, with “green cover” (cover crops during winter time) being the most implemented measure (Appendix D1).

2.2.2. Czech Republic

The programme Horizontal Rural Development Plan (HRDP) was the agri-environment programme that covered the period 2004-2006 in the Czech Republic (Ministry of Agriculture CR, 2009). New applications during 2007-2013 will be enrolled in the Rural Development Programme in the Czech Republic (RDP CR). The largest areas supported are for management of pastures and meadows and support of less favourable areas (Appendices D2a and b). Supporting of pollinators is not the main purpose of the agri-environment schemes in the Czech Republic.

2.2.3. Estonia

There are no measures in the Estonian Rural Development Plan (ERDP) with a specific objective to promote pollinators, but such objective is indirectly linked with some objectives and requirements of Axis II measures of Estonian ERDP 2004-2006 and ERDP 2007-2013. The overall objectives of the agri-environmental support in Estonia are to:

- promote the introduction and continued use of environmentally friendly agricultural methods,
- preserve and promote biological and landscape diversity,

- contribute to providing an appropriate income for those agricultural producers who manage their land in a manner that is beneficial for the environment,
- and enhance the environmental awareness of farmers.

Under the ERDP 2004-2006 agri-environment support scheme (AES) the following three measures were identified to potentially promote pollinators; environmentally friendly production, organic farming scheme and establishment, restoration and maintenance of stonewalls (Appendix D3). The environmentally friendly production can support pollinators by the requirement that at least 15% of the crops should be legumes. The scheme for establishment, restoration and maintenance of stonewalls have during 2005-2007 resulted in that 19 km of stonewalls were established, 40 km were restored and 26 km were maintained. Under the ERDP 2007-2013, the three above schemes have continued and a scheme to support the maintenance of semi-natural habitats has been added (table 5). Additionally could the establishment of mixed species hedgerows potentially favour pollinators through the increase of edge biotopes. The goal in the ERDP 2007-2013 is to have established 100 km hedgerows by 2013.

2.2.4. Finland

The Finnish agri-environment scheme 2007-2013 is structured into three parts:

- obligatory basic measures which every farmer participating in the scheme has to implement,
- additional measures with a few alternative measures one of which has to be chosen by every farmer participating the basic scheme,
- and voluntary special measures (12 different measures) which are available for all the farmers joining the basic scheme, but which always need a separate application together with a detailed implementation plan and a summary of estimated costs from the farmer before the measures can be started.

Generally the voluntary special measures include more efficient measures to address environmental issues, whereas the basic measures do not usually require many real changes in the practices of an ordinary Finnish farm and tend to be weak in their effects on environmental issues (Kuussaari et al. 2004, 2008, Herzon et al. 2010).

Most measures that have potential to promote pollinators in Finland are included in the national agri-environment scheme which has a number of different measures available for the farmers (table 6). Other such measures include non-productional investment support for environmental issues (included in the Finnish rural development programme outside the agri-environment scheme) and nature reserves (Appendix D4).

2.2.5. Germany

In Germany, federal states are responsible for the implementation of agri-environment measures, but here the uptake is presented summed for the whole country (Appendix D5). Extensive grassland management and organic farming are the schemes that cover the largest areas in Germany, in 2008 over 400 000 ha in total, respectively. In total the measures that potentially mitigate pollinator loss in Germany cover almost 1.5 million hectares.

2.2.6. The Netherlands

In the Netherlands no agri-environment scheme are available that are specifically targeted at pollinators, such as e.g. the pollen and nectar schemes known from the UK. However, several schemes are available that can directly or indirectly provide food and/or nesting resources for wild bees, such as e.g. botanic schemes, faunal schemes and schemes for landscape elements (Appendix D6). The available schemes have a contract period of 6 years.

Since 2007 the national agri-environment programme has been decentralized to the twelve provinces in the Netherlands. Each province develops its own “nature management plan”, which basically specifies the areas of the province where agri-environment schemes are desirable, and what types of schemes are available. Only farms in these designated areas can apply for agri-environment contracts. Although schemes are nationally standardized (i.e. the conditions of a certain scheme are the same in all provinces) not every scheme is available in every province, and some schemes are only available in a certain province. For example, new schemes “insect rich grassland” and “insect rich grassland margin” established in 2010 are only available in the province of Limburg. The identified measures that potentially can mitigate pollinator loss cover an area of just over 26000 hectares in the Netherlands.

Organic farming is not part of the agri-environment schemes in the Netherlands. The Dutch approach to support organic farming is quite unique in Europe. In contrast to many other countries, where support policies mainly focus on the supply side of the organic market through providing subsidies per hectare to farmers who produce organically, the policy to support organic farming in the Netherlands is mainly targeted at the demand side of the market. The growth of the demand for organic products is stimulated by the government by providing funding for research and public campaigns. There are some subsidies available for farmers who produce or want to start producing organically though, such as e.g. subsidies for education and the transfer of knowledge. In 2010 € 450 000 was allocated to these subsidies by the Ministry of Agriculture.

2.2.7. Sweden

The Rural Development Programme 2007-2013 in Sweden includes a number of measures that potentially can promote pollinators (Appendix D7), but non that is directly targeted to promote pollinators. A few specific types of measures are only available in specific areas of the country, such as restoration of traditionally managed grasslands and set-asides established to benefit biodiversity. For the future there are discussions on including a new measure to provide support to farmers who want to establish wider field margins sown with grass-flower mixes, which may provide forage resources for pollinators.

The largest national measure in Sweden is management of cultivated perennial grasslands, followed by traditional management of grasslands and organic farming. All in all, an area just over 2 million hectares is supported financially within the agri-environmental program and is potentially mitigating the loss of pollinators.

2.2.8. Switzerland

The agri-environmental scheme in Switzerland aims at promoting farmland biodiversity in general, not just pollinators. In a cross-compliance mechanism, each farmer has to manage 7% or more of his/her farmland as ecological compensation areas (ECA; Appendix D8). The Swiss ECA are aimed at promoting species diversity and prevent loss of red-listed species (Aviron et al. 2005). With respect to pollinators, two types of ECA seem particularly relevant:

- ECA meadows. They make up the bulk of ECA in the country and amount to almost 10% of the agriculturally used land of Switzerland. Prescriptions are late cut and restricted fertilisation. Late cut should allow the plants to flower and produce seed.
- Sown flower strips. There are much less ECA flower strips than ECA meadows, but they are specific for arable regions and the seed mixtures are composed mostly of flowering plants which are attractive for pollinators.

More recently the "pollinator initiative" by Syngenta has also become active in Switzerland. It has started 2010 with a few plantings of specific seed mixtures, and may become more prominent in the future.

2.2.9. United Kingdom

The Environmental Stewardship (ES) scheme is only available in England, and therefore information within this report only relates to England. Within the ES scheme, there are three elements: Entry Level Stewardship (ELS), Organic Entry Level Stewardship (OELS) and Higher Level Stewardship (HLS). Each part is designed to fit the variety of land, farmers and land managers. In England the measures under the agri-environment scheme are very

specific, resulting in a large number of different measures (see Appendix D9 and the different handbooks for details on the options; ELS 2010, OELS 2010, HLS 2010).

The “nectar flower mixture” option is available under all three parts of the ES scheme, and aim specifically at introducing flowers in the agricultural landscape to provide forage resources for nectar-feeding insects such as butterflies and bumble bees (ELS 2010). It is required that the seed mixture should contain at least four nectar-rich plants (e.g. red clover, alsike clover, bird’s-foot-trefoil, sainfoin, musk mallow, common knapweed), and no single species should making up more than 50% of the mix by weight. Other measures aim at biodiversity in a wider sense, such as “unharvested cereal headlands” and “uncropped cultivated margins for rare plants”, and can potentially also promote pollinators.

2.2.10. Other countries

For a number of other countries than the above reported, some information on, or lack of, their national measures to mitigate loss of pollinators have been compiled.

From Greece it is reported that no specific measure are available to promote pollinators.

Within the Irish agri-environmental schemes - the Rural Environmental Protection Scheme (REPS), included some measures which may indirectly benefit pollinators, but no measure specifically target pollinators (www.citizensinformation.ie/en/environment/agriculture_and_forestry/rural_environmental_protection_scheme.html).

There are no specific measures taken in Norway to directly benefit pollinators, but a resent initiative to create an action plan to maintain management of traditionally managed meadows may indirect promote pollinators (http://www.dirnat.no/content.ap?thisId=500039803). There are many nature reserves and some organic farming in Norway, but none of these actions were originally initiated to protect pollinators specifically.

No national strategy to mitigate the loss of pollinators has been identified in Serbia. The only measure at national level (by Ministry of Environment and Provincial secretariat for Environment in Vojvodina) concerning pollinators is financing the planting of melliferous trees and shrubs in new planted agricultural areas and for wind protection. However, the aim of this action is to support honeybees, not wild pollinators. For the bee genus Osmia and Megachile some actions are taken to put out nesting places near agricultural areas (figure 1).

Figure 1. *Nests provided near agricultural areas to provide nesting sites for bees species of the genus Osmia and Megachile. Photo: Ante Vujic, University of Novi Sad.*

2.3. Mass-flowering crops

Mass-flowering crops can be a rich source of nectar and pollen, but the availability is often limited to a short time period (Walther-Hellwig & Frankl 2000, Westphal et al. 2003). German studies have shown that the local density of bumble bees increases with the increasing proportion of rapeseed cultivation in the surrounding landscape (Westphal et al. 2003), but that the colony density is probably not affected (Herrmann et al. 2007). Large areas of flowering rapeseed appears to contribute to larger bumble bee colonies, particularly during the early growth phase of the colony, but not contribute to a higher production of new queens and males, probably due to a lack of late flowering resources (Herrmann et al. 2007, Westphal et la. 2009). The mass-flowering of rapeseed appear to promote mainly common bumble bee species (Westphal et al. 2006, Herrmann et al. 2007).

On average in Europe and in the EU countries, just above 7% of the utilized agricultural area is grown with flowering crops (table 4). The dominating flowering crops in terms of area in Europe are sunflower seed and rapeseed, but the national dominating crops differ between countries (table 4). Russia and Ukraine are the two European countries with the largest areas of flowering crops, with sunflower seed being the dominant crop in both countries. For the EU countries, France and Spain have the largest areas of flowering crops, with rapeseed and sunflower seed being the respective dominating crops. Considering the proportion of flowering crops, Republic of Moldova and Ukraine have the highest proportions in of the non-EU countries (20 and 17%) and Bulgaria and Hungary the highest proportions of the EU countries (17 and 16%). The EU countries with the lowest proportion flowering crops are the Netherlands and Belgium (both around 2 %, table 4).

Table 4. *Area of mass-flowering crops which production is enhanced by animal pollination in terms of quantity and quality (source: FAOSTAT 2010, year: 2008, crop dependence on animal pollination from modest (greater than 10 to less than 40 % reduction in production without flower visitors) to essential (over 90 % production reduction) based on Klein et al. (2007)), proportion of the utilized agricultural area (UAA) grown with crops that to some degree depending on animal pollination and the top three crops in terms of area that benefit from biotic pollination for different European countries.*

Country		Area poll. crop (ha)	Poll. crop of UAA (%)	Dominant poll. crops
Albania	non-EU	57 485	4.87	beans, figs , apples
Austria	EU	118 672	3.74	rapeseed, sunflower seed, soybeans
Belarus	non-EU	457 187	5.13	rapeseed, apples, beans
Belgium	EU	31 527	2.30	rapeseed, pears, apples
Bosnia and Herzegovina	non-EU	124 171	5.83	plums and sloes, apples, beans
Bulgaria	EU	903 439	17.46	sunflower seed, rapeseed, spices
Croatia	EU-candidate	146 151	11.35	sunflower seed, soybeans, plums and sloes
Czech Republic	EU	434 599	10.24	rapeseed, mustard seed, sunflower seed
Denmark	EU	178 909	6.71	rapeseed, currants, cherries
Estonia	EU	85 188	10.61	rapeseed, apples, currants
Finland	EU	70 719	3.08	rapeseed, strawberries, currants
France	EU	2 334 680	7.98	rapeseed, sunflower seed, beans
Germany	EU	1 489 291	8.80	rapeseed, apples, sunflower seed
Greece	EU	428 200	9.26	seed cotton, oranges, peaches and nectarines
Hungary	EU	943 082	16.32	sunflower seed, rapeseed, apples
Iceland	non-EU	25	0.00	cucumber and gherkins, tomatoes
Ireland	EU	10 785	0.26	rapeseed, apples, beans
Italy	EU	763 741	5.70	tomatoes, sunflower seed, soybeans
Latvia	EU	102 258	5.60	rapeseed, buckwheat, apples
Liechtenstein	non-EU	0		
Lithuania	EU	214 213	8.02	rapeseed, buckwheat, apples
Luxembourg	EU	7 312	5.62	rapeseed, apples, plums and sloes
Malta	EU	1 109	11.09	tomatoes, beans, melons
Montenegro	non-EU	7 015	1.37	plums and sloe, watermelon, figs
Netherlands	EU	34 880	1.81	apples, pears, beans
Norway	non-EU	9 888	0.97	rapeseed, apples, strawberries
Poland	EU	1 251 780	7.75	rapeseed, apples, buckwheat
Portugal	EU	279 711	8.08	figs, almonds, chestnuts
Republic of Moldova	non-EU	488 463	19.66	sunflower seed, apples, rapeseed
Romania	EU	1 484 972	10.96	sunflower seed, rapeseed, plums and sloes

Russian Federation	non-EU	9 113 700	4.23	sunflower seed, buckwheat, soybeans
Serbia	non-EU	746 718	14.77	plums and sloes, sunflower seed, soybeans
Slovakia	EU	258 299	13.34	rapeseed, sunflower seed, soybeans
Slovenia	EU	13 050	2.59	rapeseed, apples, plums and sloes
Spain	EU	1 717 088	6.15	sunflower seed, almonds, oranges
Sweden	EU	96 010	3.10	rapeseed, blueberries, strawberries
Switzerland	non-EU	34 537	2.21	rapeseed, sunflower seed, apples
The former Yugoslav Republic of Macedonia	EU-candidate	59 430	5.55	apples, beans, chillies and peppers
Ukraine	non-EU	6 943 380	16.82	sunflower seed, rapeseed, soybeans
United Kingdom	EU	672 156	3.80	rapeseed, beans, apples
Europe (mean)		**802 846**	**7.08**	**sunflower seed, rapeseed, soybeans**
EU (mean)		**535 603**	**7.32**	**sunflower seed, rapeseed, almonds**

3. Conclusions

Measures that have the potential to mitigate pollinator loss should provide habitat and resources for the pollinators and/or reduce mortality. Three different types of such measures have been identified; protected terrestrial areas, agri-environment measures and mass-flowering crops.

Habitat protection is considered the most important conservation measure for biodiversity, but few protected areas are specifically targeted towards pollinators and managed accordingly, but protection of habitat for other species may very often also benefit pollinators. Semi-natural areas, such as grasslands or uncultivated field borders, are important habitat for pollinators in agricultural landscapes and a wider protection of such areas and extensive management regimes targeted towards flower visiting insects should benefit pollinators. The proportion of protected area of the land area range from 7 to 31% in EU, with a surprisingly large average proportion of 13% (table 1).

The aim of measures within national agri-environment programmes is rarely to promote pollinators, but aims to benefiting biodiversity in general or reducing the negative influences of agriculture on the environment. However, measures that increase pollinator nest/breeding site availability or quality or flower resource abundance or reduce direct mortality have the potential to promote pollinators. Such measures include creation or restoration of semi-natural habitats, establishment of flower strips, planting of flowering

trees and bushes, reduction of herbicide inputs by conversion to organic farming or introduction of unsprayed field margins (table 2). Management restrictions for semi-natural areas are commonly occurring national measure, but the management regimes are often too intensive to benefit flower visiting insects. In several countries, there are different options to provide flower resources on farmland, such as sown strips of flowering plants or including flowering plants in fallows. UK is one of the few countries where there are specific agri-environment measures, sown flowers to provide nectar and pollen, targeted at promoting pollinators. Organic farming and unsprayed field margins, which both reduce herbicide use and thereby promote flower abundance, are frequently occurring national agri-environment measure. The proportion of organically managed farmland is on average 4% in the EU, with a range from 0 to 16% between countries (table 3).

Reviewing the reported types of agri-environment schemes available in different European countries, and that have the potential to mitigate pollinator loss, lead to a conclusion that different countries have taken quite different approaches. For example, the agri-environment scheme in the UK includes very specific mitigation measure, while, for example, the schemes are more general in both Finland and Estonia. Other countries, such as Germany and Sweden, have taken a middle way, which includes a number of more general measures (such as environmentally friendly farming and organic farming) and an additional number of more specific measures (such as establishment of flower strips and biodiversity set-asides).

Mass-flowering crops can be a rich source of nectar and pollen, but the availability is often limited to a short time period and appears to mainly benefit common pollinators. The two dominating flowering crops in Europe in terms of area are sunflower seed and rapeseed. On average, 7% of the agricultural area in Europe is covered by flowering crops, and for individual countries the proportion range from 2 up to 20%. Mass-flowering crops such as rapeseed appear to have limited influence of pollinator population growth, why agri-environment measures providing flower resources when the crops are not in bloom could be a fruitful complement.

An essential further step to mitigate the loss of pollinators is to develop measures specifically targeted at promoting pollinators, i.e. providing habitat and essential resources and reducing mortality. From the acquired uptake data it is evident that there are initiatives to develop measures for providing flower resources, but fewer for specifically providing nesting habitat. A first step to develop new mitigation measures is to identify the importance of different factors limiting pollinator population growth and to base future measures on such knowledge. For the measures that do occur today and are targeted or have the potential to promote pollinators, some modifications could increase their value to pollinators, such as extensification of semi-natural habitat management. Additionally, the uptake of these measures is often limited, why efforts to increase the uptake would make the value of the measures to pollinators higher. New potential threats to pollinators must be

continuously monitored, such as the development of new types of pesticides, to form the basis for the development of future mitigation measures.

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Appendix A. E-mail sent to STEP partners and other contacts in 25 European countries to acquire information on national mitigation measures to counteract pollinator declines. An attachment giving further information on the information needed was sent alongside the e-mail (see Appendix B).

Dear [CONTACT]

The project Status and Trends of European Pollinators (STEP) - funded by the European Community's Seventh Framework Programme (FP7/2007-2013) - addresses the decline of pollinators in Europe. The overall aim of STEP is to assess the current status and trends of pollinators in Europe, quantify the relative importance of various drivers and impacts of change, identify relevant mitigation strategies and policy instruments, and disseminate this to a wide range of stakeholders.

Within the STEP-project, we - Maj Rundlöf and Jeroen Scheper – focus on mitigation strategies to address pollinator loss. We will try to identify available strategies for mitigating pollinator loss in Europe, assess the uptake of these measures throughout Europe and evaluate their effectiveness in promoting pollinators.

For this purpose, we would like to have information on the availability and uptake of any measures that aim, or have the potential, to promote pollinators in [COUNTRY]. In addition, we would like to have information on the effectiveness of these measures.

We would greatly appreciate if you could take some time to either send us any of the required information (see attachment for description) or suggest other persons within your country that might have access to relevant information.
Thank you in advance.

Kind regards,

Maj Rundlöf
E-mail: maj.rundlof@ekol.slu.se

Jeroen Scheper
E-mail: jeroen.scheper@wur.nl

For more information on the STEP project, visit the project website: www.step-project.net

Appendix B. Attachment giving further information on the information needed to acquire information on national mitigation measures to counteract pollinator declines, sent alongside the enquiry e-mail (Appendix A).

Information on European mitigation strategies to address pollinator loss

Status and Trends of European Pollinators (STEP)

Maj Rundlöf and Jeroen Scheper

1. Availability and uptake

We seek information on the availability and uptake of any measures that aim, or have the potential, to promote pollinators in your country. Mitigation measures range from agri-environment schemes to nature reserves, and include for example those measures that are specifically targeted at bees, hoverflies and/or butterflies, such as wildflower field margins under agri-environment schemes, as well as those measures that are not specifically targeted at enhancing pollinators but may be expected to have beneficial effects on pollinators, such as organic farming.

- Do you have any information on the availability of (potential) measures that mitigate pollinator loss in your country, such as agri-environment schemes, organic farming, mass flowering crops, nature reserves, etc.?
- Do you have any information on the uptake (e.g. in hectares and/or in amount of subsidies spent per year) of each of these measures in your country?

2. Effectiveness

Although we already have acquired quite some information from studies published in peer-reviewed journals, we would still like to get information from less accessible or unpublished reports from (non)governmental agencies or research institutions.

- Do you have any reports on the evaluation of the effectiveness of these measures in promoting the abundance and/or species richness of pollinators in your country?

3. If you do not have any information on the uptake and/or evaluation of mitigation measures, could you put us in contact with anyone who has access to this information?

Appendix C. Responses from contacted countries approached with questions on the uptake of national agri-environment schemes and other mitigation measures to promote pollinators.

Country		Contact person identified	Response	Comment
Austria	EU	yes	no	
Belgium	EU	yes	yes	uptake data
Bulgaria	EU	yes	no	
Cyprus	EU	no		
Czech Republic	EU	yes	yes	uptake data, description of AES system
Denmark	EU	yes	(yes)	some comments
Estonia	EU	yes	yes	uptake data, description of AES system
Finland	EU	yes	yes	extensive review, uptake data, description of AES system
France	EU	yes	(no)	
Germany	EU	yes	yes	uptake data, description of AES system
Greece	EU	yes	yes	no known measures
Hungary	EU	yes	no	
Ireland	EU	yes	yes	description of AES system, some web links
Italy	EU	yes	(yes)	some comments
Latvia	EU	no		
Lithuania	EU	yes	no	
Luxembourg	EU	no		
Malta	EU	no		
Netherlands	EU	yes	yes	uptake data, description of AES system
Poland	EU	yes	no	
Portugal	EU	no		
Romania	EU	yes	no	
Slovakia	EU	yes	no	
Slovenia	EU	yes	no	
Spain	EU	yes	no	
Sweden	EU	yes	yes	uptake data, description of AES system
United Kingdom	EU	yes	yes	uptake data, description of AES system
Norway	non-EU	yes	yes	few measures, some web links
Serbia	non-EU	yes	yes	no measures for wild pollinators
Switzerland	non-EU	yes	yes	uptake data, description of AES system

Appendix D. National uptakes, in area, length or economic support, of agri-environment measures that potentially can mitigate the loss of pollinators in different European countries.

Appendix D1. *Area with agri-environment schemes 2000-2007 in Flanders, Belgium (ha).*

Measure / Year	2007	2006	2005	2004	2003	2002	2001	2000
"green cover"	75 958	78 031	72 103	68 275	39 582	34 330	27 132	5 655
mechanical weed control	6 191	6 207	5 973	4 966	2 627	2 033	1 298	151
ornamental horticulture	920	1 102	748	748	767	668	344	375
species conservation management scheme	732	961	816	620	499	443	251	165
field margin management scheme	1 204	1 222	530	370	308	210	89	35
small landscape elements management scheme	4 634	7 392	7 158	6 486	5 602	4 437	1 183	426
botanical management scheme	201	203	81	17	0	0	0	0
nature management scheme	1 403	1 397	2 628	2 130	1 934	1 726	1 597	1 372
water management scheme	29 384	29 300	27 800	27 210	30 709	32 019	29 665	17 526
subsidy standard fruit trees	482	388	232	0	0	0	0	0
support organic pig (sow) farming	6	6	6	6	6	6	0	0
hectare support organic farming	2 704	2 645	2 689	2 735	2 861	1 839	1 584	1 350
hectare support integrated pit fruit	396	888	4 941	6 749	10 058	9 408	8 478	5 157
Fabaceae	5 751	4 766	3 018	1 057	0	0	0	0
erosion management scheme	2 091	1 736	920	0	0	0	0	0
TOTAL AREA	**132 057**	**136 244**	**129 643**	**121 369**	**94 953**	**87 119**	**71 621**	**32 212**
ESTIMATED UNIQUE AREA	**121 513**	**125 001**	**118 945**	**111 354**	**87 117**	**79 930**	**65 711**	**29 554**

Appendix D2a. *HRDP (Horizontal rural development plan) areas (ha) in 2004-2009 in the Czech Republic.*

Measure / Year	2004	2005	2006	2007	2008	2009
Less favourable areas (LFA)	721 000	706 410	720 734	0	0	0
Reforestration	570	673	884	884	884	884
Ecological farming (A1)	231 859	224 000	215 055	120 785	118 097	1 597
Integrated production (A2)		17 000	15 109	5 314	5 293	5 109
Total (A1- A2)	**231 859**	**241 000**	**230 164**	**126 099**	**123 390**	**6 706**
Pastures and meadows management				267 333	261 930	14 507
				16 580	16 423	1 025
				19 415	18 780	1 410
				588	588	1
				38 965	37 852	2 085
				214 099	208 650	10 748
Total (pasture and meadow)	**723 313**	**712 969**	**698 151**	**556 980**	**544 223**	**29 776**
Arable land change to pastures (C1)	5 757	15 198	32 560	33 763	33 752	28 221

Grass belts on slopes (C2)	13	53	75	91	89	82
Catch crops (C3)	198 249	192 059	199 719	202 567	200 865	5 672
Underfloodimg pastures and meadows (C4)	185	159	199	121	121	45
Support of birds (C5)	6 282	6 181	5 996	5 103	5 079	183
Biobelts (C6)	276	584	1 318	1 189	1 182	937
Total (C1 – C6)	**210 761**	**214 234**	**239 867**	**242 834**	**241 088**	**35 140**
Rotation of crops around caves (D)	48	48	48	48	48	0
HRDP total	***1 887 551***	***1 875 334***	***1 889 848***	***926 845***	***909 633***	***72 506***

Appendix D2b. *EAFRD (European Agricultural Fund for Rural Development) areas (ha) in 2007-2009 in the Czech Republic.*

Measure / Year	**2007**	**2008**	**2009**
Less favourable areas (LFA), mountains (H)	353 994	356 974	358 724
Less favourable areas (LFA), other than mountains (O, S)	407 191	412 695	416 408
Total (less favourable areas)	**761 185**	**769 669**	**775 132**
Natura 2000 in agriculture areas	2 802	3 745	3 911
Ecological farming (A1)	153 019	187 771	363 492
Integrated production (A2)	20 095	21 755	22 934
Total (A1 – A2)	**173 114**	**209 526**	**386 426**
Pastures and meadows management	59 449	67 127	293 055
	15 635	16 638	57 204
	4 680	5 067	15 185
	587	609	1 542
	603	634	1 143
	2 623	2 727	10 882
	68 899	76 568	259 326
	34 365	37 111	96 331
	733	754	988
Total (pasture and meadow)	**187 575**	**207 235**	**735 656**
Arable land change to pastures (C1)	15 801	21 449	30 317
Catch crops (C3)	4 949	5 221	80 298
Biobelts (C3)	369	549	1 100
Total (C1 – C3)	**21 119**	**27 219**	**111 716**
Reforestration	686	546	304
Natura 2000 in forest areas	0	264	1 040
Forest – envi	0	0	2 609
EAFRD total	***1 146 480***	***1 218 204***	***2 016 793***

Appendix D3. *Uptake (area in ha) of agri-environment schemes with the potential to mitigate pollinator loss in Estonia, under the Estonian Rural Development Plan (ERDP) during 2004-2006 and 2007-2013, over the years 2004-2009.*

Measure / Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
environmentally friendly production (ERDP 2004-2006)	451 787	455 777	433 443	467 093	461 169	8 394[1]
organic farming (ERDP 2004-2006)	36 991	49 901	61 568	69 682	73 764	11 364[1]

environmentally friendly production (ERDP 2007-2013)					469 898
organic farming (ERDP 2007-2013)					77 073
support for the maintenance of semi-natural habitats (ERDP 2007-2013)			15 501	18 244	20 724

[1] The low numbers in 2009 are due to the passing of the first five year commitments, which started in 2004. New commitments can be taken on under the ERDP 2007-2013.

Appendix D4. *Uptake, economic support and amount of subsidies spent per year in Finland 2009 on measures with the potential to promote pollinators.*

Measure	Uptake (ha)	Economic support (€/ha)	Amount of subsidies spent per year (1000 €)
Environmental fallow	130610		
- grassland fallow	107822	170	18330
- meadow fallow	3945	300	1184
- game field	17333	300	5200
- landscape fallow	1471	300	441
Field margins and buffer strips	92% of farmland	*	*
Preservation of biodiversity habitats	92% of farmland	*	*
Diverse crop rotation	193073	24	4474
>15 m wide buffer zones	7050	max. 450	3110
Construction of multi-function wetlands	91	max. 450	28
Management of traditional rural biotopes	23967	max. 450	7708
Management of other biodiversity habitats and visual landscape	8513	max. 450	2956
- open strips in field-forest edges	ca 15%		
- small forest patches within fields	ca 5%		
- natural pastures	>50%		
- wild flower strips	very rare		
Organic farming	149367	141	23032
Investment support for environmental issues	new measure		
construction of multifunction wetlands	low		
restoration of semi-natural grasslands	low		
Nature reserves	3952000		

* A total of 219 931 000 € were spent on the obligatory basic measures in 2009, when a total of 2 112 143 ha and 58 083 farms were committed to the basic measures.

Appendix D5. *Uptake and economic support in Germany 2005-2009 for agri-environment schemes that potentially can promote pollinators.*

	2005		2006		2007		2008		2009	
Measure	Area (ha)	Budget (1000 €)	Area (ha)	Budget (1000 €)	Area (ha)	Budget (1000 €)	Area (ha)	Budget (1000 €)	Area (ha)	Budget (1000 €)
Catch crops/winter	107967	628	100474	592	73806	439	62703	297	66767	56

cover with plants										
No-till farming	342546	807	340173	1022	162420	395	255703	641	224523	783
Flowering strips/areas	7915	126	8264	145	11782	136	11636	121	9303	42
Set-asides	2943	96	4118	100	656353	98	3677	83	3476	122
Extensive grassland management	403977	5238	468777	5333	441485	5075	418923	4441	236274	1397
Management of hedges	93	60	324	85	284	76	259	66	117	57
Management of mixed orchards	3582	83	4863	176	4213	167	6655	75	1458	72
Versatile crop rotation	172334	728	196405	852	191066	804	230817	12	8055	22
Organic farming	377850	3920	424772	4063	410497	3860	433122	3434	300820	2569
In total	**1419207**	**11686**	**1548170**	**12368**	**1951906**	**11050**	**1423495**	**9159**	**850794**	**5120**

Appendix D6. *Uptake and economic support of potential pollinator loss mitigation measures in the Netherlands in 2009.*

Measure	Area (ha)	Economic support (€)
Grasland: whole-field		
Flower-rich haymeadow	264	380054
Flower-rich pasture	1147	1209991
Flower-rich haymeadow with grazing period	3066	3460626
Conservation herb-rich grassland	1666	1718631
Herb-rich pasture	570	766857
Scenic valuable grassland	1328	347824
Development herb-rich grasland	7344	8341001
Total	**15385**	**16224984**
Grasland: margins and edges		
Flower-rich haymeadow field margin	78	133398
Flower-rich pasture field margin	5347	6234321
Herb-rich edges	277	508737
Total	**5702**	**6876456**
Arable land: whole-field		
Arable fauna	128	93875
Arable flora whole-field	13	5896
Flora-rich arabale land 1 (Formerly known as "every second year cereal")	135	17273
Flora-rich arabale land 2 (Formerly known as "5 of 6 years cereal")	154	54013
Arable land free of artificial fertilizer and chemical pesticides	416	312449
Set-aside	112	13181
Circulating field part with cereal	227	92717
Total	**1185**	**589404**
Arable land: margins		
Arable flora field margins (minimum width 3m)	6	4826
Arable flora field margins (minimum width 6m)	25	22997
Fauna field margin	1455	2065162
Total	**1486**	**2092985**
Landscape elements		
Wooded quayside, wooded bank, hedge and shelter belt	683	430629
Cut or trimmed hedgerow	1171	892001
"Hollow road" (eroded road)	1	1950
Standard orchard	535	1122570

Total	**2390**	**2447150**
All schemes in total	***26148***	***28 230 979***

Appendix D7. *Uptake and economic support for measures in Sweden 2009 that potentially can mitigate pollinator loss.*

Measure	Applied area (ha)	Economic support (€)[1]	N farmers applied
National measures year 2009			
Traditionally managed semi-natural grasslands (mown meadows and grazed pastures)	456 918	73 626 374	34 309
- Grazed grassland with special values			
- Grazed grassland with general values			
- Mown grassland with special values			
- Mown grassland with general values			
- Grazed alvar			
- Grazed forest			
- Grazed northern grassland			
Cultivated grasslands/Open and varied landscape	909 637	66 414 796	39 367
- Cultivated perennial grasslands (min 3 years)			
Environmental protection measures	246 415	2 707 857	2 412
- Unsprayed field margins			
Organic production	444 000	53 406 593	12 600
- Certified organic farming			
- Non-certified organic farming			
Cultural heritage/Landscape elements	counted in meters and numbers	10 549 451	
- Landscape elements such as open ditches and stonewalls			
- Landscape elements such as uncultivated field islands			
Regional measures year 2009			
Selected areas - grasslands	534	1 534 922	65
- Restoring traditionally managed grasslands			
- Grazed mosaic grasslands			
Selected areas - arable land			
- Conservation of rare field weeds			
- Biodiversity fallow/set-aside	30	6 593	
Selected areas - cultural heritage	2195 trees	219 670	55
- Restoring and replanting of tree rows			
Potential future measures			
Wider field borders sown with grasses or flowers			
All measures in total	***2 057 534***	***208 466 256***	

[1] Payments until April 2010.

Appendix D8. *Uptake (ha) of ecological compensation areas in Switzerland 2008-2009.*

Category	2008	2009
extensive meadow-land*	58 091	60 058
less intensive meadow-land*	27 404	25 860
reed-beds*	7 225	7 363
hedges, copses and wooded river banks (with grassy band strip)*	2 517	2 650
flowery meadows*	1 997	1 751
rotated fallow fields*	740	593
band strip on arable land*	16	35
natural field margins*	37	45
standard fruit trees (with trunk and crown), piece*	2 242 114	2 217 037
extensively used pasture	19 899	20 869
forest pastures	2 073	2 325
hedges, copses and wooded river banks (without grassy band strip)	744	-
ponds and pools	243	242
ruderal areas, stone walls	324	329
dry stone walls	23	23
naturally vegetated paths	264	-
other ecological compensation areas	578	370
vineyards with a high species diversity	224	203
standard fruit trees (with trunk and crown), piece	90 178	89 835
indigenous trees and avenues adapted to the location	139 228	143 728

*entitled to subsidy payments

Appendix D9. *Uptake under the Environmental Stewardship (ES) scheme in England between 1st Jan 2005 and 31st Dec 2009. ES consists of three elements: Entry Level Stewardship (ELS), Organic Entry Level Stewardship (OELS) and Higher Level Stewardship (HLS). In the 'Option' column, ELS option codes are prefixed with an 'E'; OELS option codes are prefixed with an 'O'; and HLS option codes are prefixed with an 'H'. Some ELS options are also available under HLS in which case these codes are formed by replacing the 'E' with 'H' at the start of the relevant ELS option. Options which were introduced as new in 2009 or 2010 are not included.*

Option	Agreements Containing Selected Options	Option Area (Ha)	Option Area (m2)	Option Length (m)	Total Option Items
TOTAL	37 294	14 370 512	1 431 391	266 068 831	1 319 843
ADC - Hard surface for disabled path	10	0	6 295	0	0
ADG - Dog gate	8	0	0	0	36
B - Bench	35	0	0	0	76
BCA - Chemical Bracken Control - Area Payment	158	2 933	0	0	0
BCB - Chemical Bracken Control - Base Payment	139	0	0	0	200
BDS - Difficult site supplement for bracken & scrub control	107	988	0	0	0
BMA - Mechanical Bracken Control - Area Payment	80	1 696	0	0	0
BMB - Mechanical Bracken Control - Base Payment	75	0	0	0	152
BR - Stone-faced hedgebank repair	30	0	0	6 320	0
BS - Stone-faced hedgebank restoration	30	0	0	4 010	0
C - Culvert	92	0	0	0	283
CBT - Coppicing bankside trees	266	0	0	0	9 808
CCG - Cattle grid	18	0	0	0	45
CDB - Cattle Drinking Bay	39	0	0	0	111
CLH - Livestock handling facilities	108	0	0	0	0
CP - Hard standing for car park	21	0	8 238	0	0
DR - Ditch, dyke and rhine restoration	209	0	0	223 040	0
E - Removal of eyesore	107	0	0	0	218
EA1 - Farm Environment Record (FER)	34 934	4 668 462	0	0	0
EB1 - Hedgerow management (on both sides of hedge)	18 643	0	0	65 484 461	0
EB10 - Combined hedge and ditch management (incorporating EB3)	4 021	0	0	5 069 089	0
EB11 - Stone wall protection and maintenance	4 406	0	0	16 968 025	0
EB2 - Hedgerow management (on one side of hedge)	20 899	0	0	71 742 225	0
EB3 - Enhanced hedgerow management	9 507	0	0	28 093 942	0

EB4 - Stone faced hedge bank management on both sides	484	0	0	1 453 958	0
EB5 - Stone faced hedge bank management on one side	553	0	0	1 433 368	0
EB6 - Ditch management	10 405	0	0	18 550 637	0
EB7 - Half ditch management	5 788	0	0	10 062 340	0
EB8 - Combined hedge and ditch management (incorporating EB1)	6 933	0	0	10 086 230	0
EB9 - Combined hedge and ditch management (incorporating EB2)	6 090	0	0	6 312 710	0
EC1 - Protection of in-field trees (arable)	3 859	0	0	0	32 894
EC2 - Protection of in-field trees (grassland)	8 581	0	0	0	202 279
EC3 - Maintenance of woodland fences	4 556	0	0	8 310 495	0
EC4 - Management of woodland edges	2 735	1 580	0	0	0
ED1 - Maintenance of traditional farm buildings	1 402	0	616 103	0	0
ED2 - Take archaeological features out of cultivation	324	1 465	0	0	0
ED3 - Low depth, non-inversion cultivation on archaeological features	256	8 554	0	0	0
ED4 - Management of scrub on archaeological features	142	626	0	0	0
ED5 - Management of archaeological features on grassland	2 890	53 979	0	0	0
EE1 - 2m buffer strips on cultivated land	1 860	1 774	0	0	0
EE2 - 4m buffer strips on cultivated land	3 630	6 643	0	0	0
EE3 - 6m buffer strips on cultivated land	5 953	14 713	0	0	0
EE4 - 2m buffer strips on intensive grassland	740	488	0	0	0
EE5 - 4m buffer strips on intensive grassland	814	681	0	0	0
EE6 - 6m buffer strips on intensive grassland	1 397	1 441	0	0	0
EE7 - Buffering in-field ponds in improved grassland	388	161	0	0	0
EE8 - Buffering in-field ponds in arable land	667	280	0	0	0
EF1 - Field corner management	7 313	14 767	0	0	0
EF10 - Unharvested cereal headland within arable fields	179	497	0	0	0
EF11 - Uncropped, cultivated margins for rare plants on arable land	374	644	0	0	0
EF2 - Wild bird seed mixture	62	95	0	0	0
EF2NR - Wild bird seed mixture	3 287	4 030	0	0	0
EF3 - Wild bird seed mixture on set-aside land	457	661	0	0	0
EF4 - Nectar Flower mixture	1 904	1 910	0	0	0
EF5 - Pollen + nectar flower mixture on set-aside land	129	206	0	0	0
EF6 - Over-wintered stubbles	4 200	62 586	0	0	0
EF7 - Beetle banks	427	94	0	0	0
EF8 - Skylark plots	521	0	0	0	14 885
EF9 - Unfertilised cereal headland within arable fields	107	680	0	0	0

EG1 - Under sown spring cereals	342	2 404	0	0	0
EG2 - Wild bird seed mixture in grassland areas	9	9	0	0	0
EG2NR - Wild bird seed mixture in grassland areas	215	163	0	0	0
EG3 - Nectar flower mixture in grassland areas	64	33	0	0	0
EG4 - Cereals for whole crop silage followed by over-wintered stubbles	192	819	0	0	0
EG5 - Brassica fodder crops followed by over-wintered stubbles	595	7 155	0	0	0
EJ1 - Management of high erosion risk cultivated land	291	8 681	0	0	0
EJ2 - Management of maize crops to reduce soil erosion	424	8 905	0	0	0
EK1 - Take field corners out of management: outside SDA & ML	995	563	0	0	0
EK2 - Permanent grassland with low inputs: outside SDA & ML	14 538	213 889	0	0	0
EK3 - Permanent grassland with very low inputs: outside SDA & ML	10 020	77 791	0	0	0
EK4 - Manage rush pastures: outside SDA & ML	855	3 912	0	0	0
EK5 - Mixed stocking	3 141	195 770	0	0	0
EL1 - Field corner management: SDA land	264	249	0	0	0
EL2 - Permanent in-bye grassland with low inputs: SDA land	2 326	60 242	0	0	0
EL3 - In-bye pasture & meadows with very low inputs: SDA land	1 584	15 383	0	0	0
EL4 - Manage rush pastures: SDA land & ML parcels under 15ha	661	8 924	0	0	0
EL5 - Enclosed rough grazing: SDA land & ML parcels under 15ha	504	8 042	0	0	0
EL6 - Moorland and rough grazing: ML land only	390	110 178	0	0	0
EM1 - Soil management plan (pre-RDPE)	10 108	1 953 890	0	0	0
EM2 - Nutrient management plan (pre-RDPE)	9 828	2 020 966	0	0	0
EM3 - Manure management plan (pre-RDPE)	8 859	1 543 117	0	0	0
EM4 - Crop protection management plan (pre-RDPE)	10 191	1 972 625	0	0	0
ER - Earth bank restoration	93	0	0	45 835	0
ERC - Casting up supplement - hedgebank options	117	0	0	160 545	0
FB - Footbridge	46	0	0	0	161
FD - Deer fencing	16	0	0	12 260	0
FDS - Fencing supplement - difficult sites	209	0	0	274 517	0
FHT - High tensile fencing	12	0	0	52 399	0
FP - Fruit tree pruning and restoration	58	0	0	0	2 666
FPE - Permanent electric fencing	27	0	0	58 308	0
FR - Rabbit fencing supplement	53	0	0	70 115	0
FSB - Sheep Fencing - newly restored boundary	743	0	0	1 081 136	0
FSH - Sheep Fencing	781	0	0	1 201 405	0
FW - Post and wire fencing	205	0	0	218 678	0

FWB - Post and wire fencing - newly restored boundary	167	0	0	169 236	0
GB - Bridle gate	90	0	0	0	341
GBC - Grip Blocking Drainage Channels	24	0	0	0	264 468
GD - Kissing gate for disabled access	28	0	0	0	134
GF - Wooden field/river gate	1 036	0	0	0	5 085
GK - Kissing gate	135	0	0	0	420
GS - Supp: Use of Native Seed	163	0	0	0	0
HAP - Historical & archaeological feature protection	58	0	0	0	0
HB11 - Maintenance of hedges of very high environmental value (2 sides)	56	0	0	99 509	0
HB12 - Maintenance of hedges of very high environmental value (1 side)	405	0	0	1 012 662	0
HC1 - Protection of in-field trees - arable	77	0	0	0	478
HC10 - Creation of woodland outside of the SDA & ML	216	218	0	0	0
HC11 - Woodland livestock exclusion supplement	188	680	0	0	0
HC12 - Maintenance of wood pasture and parkland	102	2 904	0	0	0
HC13 - Restoration of wood pasture and parkland	70	1 601	0	0	0
HC14 - Creation of wood pasture	16	252	0	0	0
HC15 - Maintenance of successional areas and scrub	212	877	0	0	0
HC16 - Restoration of successional areas and scrub	117	367	0	0	0
HC17 - Creation of successional areas and scrub	125	395	0	0	0
HC18 - Maintenance of high value traditional orchards	74	164	0	0	0
HC19 - Maintenance of traditional orchards in production	16	58	0	0	0
HC2 - Protection of in-field trees - grassland	120	0	0	0	1 664
HC20 - Restoration of traditional orchards	201	234	0	0	0
HC21 - Creation of traditional orchards	142	116	0	0	0
HC4 - Management of woodland edges	38	8	0	0	0
HC5 - Ancient trees in arable fields	24	0	0	0	111
HC6 - Ancient trees in intensively-managed grass fields	32	0	0	0	155
HC7 - Maintenance of woodland	657	3 975	0	0	0
HC8 - Restoration of woodland	590	3 060	0	0	0
HC9 - Creation of woodland in the SDA	87	87	0	0	0
HD1 - Maintenance of traditional farm buildings	124	0	62 992	0	0
HD10 - Maintenance of traditional water meadows	3	33	0	0	0
HD11 - Restoration of traditional water meadows	1	27	0	0	0
HD2 - Take archaeological features out of cultivation	243	2 227	0	0	0
HD3 - Low depth, non-inversion cultivation on archaeological features	119	3 159	0	0	0

HD4 - Management of scrub on archaeological features	82	316	0	0	0
HD5 - Management of archaeological features on grassland	544	7 758	0	0	0
HD6 - Crop establishment by direct drilling (non-rotational)	10	770	0	0	0
HD7 - Arable reversion by natural regeneration	129	931	0	0	0
HD8 - Maintaining high water levels to protect archaeology	1	3	0	0	0
HD9 - Maintenance of designed/engineered water bodies	17	29	0	0	0
HE1 - 2m buffer strips on arable land	147	124	0	0	0
HE10 - Floristically enhanced grass margin	382	1 090	0	0	0
HE11 - Enhanced strips for target species on intensive grassland	6	6	0	0	0
HE2 - 4m buffer strips on arable land	228	433	0	0	0
HE3 - 6m buffer strips on arable land	599	2 242	0	0	0
HE4 - 2m buffer strip on intensive grassland	35	12	0	0	0
HE5 - 4m buffer strip on intensive grassland	46	35	0	0	0
HE6 - 6m buffer strip on intensive grassland	135	151	0	0	0
HE7 - Buffering in-field ponds in permanent improved grassland	17	8	0	0	0
HE8 - Buffering in-field ponds in permanent arable land	66	35	0	0	0
HF - Hedgerow supplement - removal of old fence lines	302	0	0	207 109	0
HF1 - Management of field corners	379	596	0	0	0
HF10 - Unharvested cereal headland within arable fields	54	208	0	0	0
HF11 - Uncropped, cultivated margins for rare plants on arable land	41	67	0	0	0
HF12 - Enhanced wild bird seed mix plots	704	1 633	0	0	0
HF12NR - Enhanced wild bird seed mix plots	27	64	0	0	0
HF13 - Fallow plots for ground-nesting birds	471	2 394	0	0	0
HF13NR - Fallow plots for ground-nesting birds	9	20	0	0	0
HF14 - Unharvested, fertiliser-free conservation headland	159	377	0	0	0
HF14NR - Unharvested, fertiliser-free conservation headland	2	3	0	0	0
HF15 - Reduced herbicide cereal crop preceding over-wintered stubble	100	1 081	0	0	0
HF16 - Cultivated plot or margin for arable flora - enhanced setaside	6	10	0	0	0
HF17 - Fallow plots for ground-nesting birds - enhanced setaside	26	124	0	0	0
HF18 - Reduced herbicide cereal crop preceding enhanced set-aside	10	96	0	0	0
HF19 - Unharvested conservation headlands preceding enhanced set-aside	16	32	0	0	0
HF2 - Wild bird seed mixture	2	9	0	0	0
HF20 - Cultivated fallow plots or margins for arable plants	173	357	0	0	0
HF20NR - Cultivated fallow plots or margins for arable plants	5	4	0	0	0
HF2NR - Wild bird seed mixture	182	279	0	0	0

HF3 - Wild bird seed mixture on set-aside land	16	22	0	0	0
HF4 - Nectar Flower mixture	374	529	0	0	0
HF5 - Pollen & nectar flower mixture on set-aside land	10	9	0	0	0
HF6 - Over-wintered stubbles	342	4 344	0	0	0
HF7 - Beetle banks	111	24	0	0	0
HF8 - Skylark plots	81	0	0	0	2 496
HF9 - Unfertilised cereal headland within arable fields	20	146	0	0	0
HG1 - Under sown spring cereals	25	173	0	0	0
HG2 - Wild bird seed mixture	2	1	0	0	0
HG2NR - Wild bird seed mixture	28	29	0	0	0
HG3 - Nectar flower mixture in grassland areas	13	7	0	0	0
HG4 - Cereals for whole crop silage followed by over-wintered stubbles	17	82	0	0	0
HG5 - Brassica fodder crops followed by over-wintered stubbles	28	306	0	0	0
HG6 - Fodder crop management to retain or re-create an arable mosaic	31	273	0	0	0
HG7 - Low input spring cereal to retain or re-create an arable mosaic	221	2 140	0	0	0
HG7NR - Low input spring cereal to retain or re-create an arable mosaic	2	6	0	0	0
HJ1 - Cropping restrictions on high erosion risk fields	6	323	0	0	0
HJ2 - Management of maize crops to reduce run off and erosion	5	76	0	0	0
HJ3 - Reversion to unfertilised grassland to prevent erosion/run-off	124	1 176	0	0	0
HJ4 - Reversion to low input grassland to prevent erosion/run-off	57	713	0	0	0
HJ5 - In field grass areas to prevent erosion or run-off	122	407	0	0	0
HJ6 - Preventing erosion or run-off from intensively managed grassland	32	464	0	0	0
HJ7 - Seasonal livestock removal from intensively managed grassland	10	199	0	0	0
HJ8 - Nil fertiliser supplement	21	218	0	0	0
HK1 - Take field corners out of management: outside SDA & ML	52	28	0	0	0
HK10 - Maintenance of wet grassland for wintering waders and wildfowl	225	4 755	0	0	0
HK11 - Restoration of wet grassland for breeding waders.	138	2 762	0	0	0
HK12 - Restoration of wet grassland for wintering waders and wildfowl	87	1 394	0	0	0
HK13 - Creation of wet grassland for breeding waders	103	1 625	0	0	0
HK14 - Creation of wet grassland for wintering waders and wildfowl	51	612	0	0	0
HK15 - Maintenance of grassland for target features	626	10 514	0	0	0
HK16 - Restoration of grassland for target features	304	4 245	0	0	0
HK17 - Creation of grassland for target features	391	4 209	0	0	0
HK18 - Supplement for haymaking	439	3 328	0	0	0
HK19 - Raised water levels supplement	57	1 407	0	0	0

HK2 - Permanent grassland with low inputs: outside SDA & ML	203	2 859	0	0	0
HK3 - Permanent grassland with very low inputs: outside SDA & ML	383	3 891	0	0	0
HK4 - Manage rush pastures: outside SDA & ML	14	61	0	0	0
HK5 - Mixed stocking	88	3 160	0	0	0
HK6 - Maintenance of species-rich, semi-natural grassland	793	9 899	0	0	0
HK7 - Restoration of species-rich, semi-natural grassland	1 200	15 039	0	0	0
HK8 - Creation of species-rich, semi-natural grassland	207	2 046	0	0	0
HK9 - Maintenance of wet grassland for breeding waders	182	5 430	0	0	0
HL1 - Take field corners out of management: SDA land	3	1	0	0	0
HL10 - Restoration of moorland	221	71 277	0	0	0
HL11 - Creation of upland heathland	7	565	0	0	0
HL12 - Management of heather, gorse and grass	69	44 098	0	0	0
HL13 - Moorland re-wetting supplement	32	1 808	0	0	0
HL15 - Seasonal livestock exclusion supplement	130	40 279	0	0	0
HL16 - Shepherding supplement	28	13 240	0	0	0
HL2 - Permanent grassland with low inputs: SDA land	54	711	0	0	0
HL3 - Permanent grassland with very low inputs: SDA land	138	1 117	0	0	0
HL4 - Manage rush pastures: SDA land & ML parcels under 15ha	22	165	0	0	0
HL5 - Enclosed rough grazing: SDA land & ML parcels under 15ha	13	77	0	0	0
HL6 - Unenclosed moorland rough grazing: ML land only	8	387	0	0	0
HL7 - Maintenance of rough grazing for birds	145	5 136	0	0	0
HL8 - Restoration of rough grazing for birds	137	4 725	0	0	0
HL9 - Maintenance of moorland	74	28 768	0	0	0
HM1 - Soil management (pre-RDPE)	81	11 284	0	0	0
HM2 - Nutrient management (pre-RDPE)	58	7 810	0	0	0
HM3 - Manure management (pre-RDPE)	65	8 606	0	0	0
HM4 - Crop protection management (pre-RDPE)	28	3 024	0	0	0
HN1 - Linear and open access base payment	585	0	0	0	587
HN2 - Permissive open access	132	1 671	0	0	0
HN3 - Permissive footpath access	449	0	0	684 606	0
HN4 - Permissive bridleway / cycle path access	154	0	0	542 002	0
HN5 - Access for people with reduced mobility	24	0	0	22 051	0
HN6 - Upgrading access for cyclists/horses	10	0	0	18 534	0
HN7 - Upgrading access for people with reduced mobility	3	0	0	1 175	0
HN8 - Educational access - base payment	320	0	0	0	322

HN9 - Educational access - payment per visit	303	0	0	0	2 077
HO1 - Maintenance of lowland heathland	64	4 107	0	0	0
HO2 - Restoration of heathland from neglected sites	122	11 075	0	0	0
HO3 - Restoration of forestry areas to lowland heathland	29	925	0	0	0
HO4 - Creation of lowland heathland from arable or improved grassland	11	114	0	0	0
HP1 - Maintenance of sand dunes	12	680	0	0	0
HP10 - Supplement for extensive grazing on saltmarsh	19	534	0	0	0
HP11 - Saltmarsh livestock exclusion supplement	4	104	0	0	0
HP2 - Restoration of sand dune systems	10	966	0	0	0
HP4 - Creation of vegetated shingle and sand dune on grassland	1	5	0	0	0
HP5 - Maintenance of coastal saltmarsh	47	3 827	0	0	0
HP6 - Restoration of coastal saltmarsh	15	299	0	0	0
HP7 - Creation of inter-tidal and saline habitat on arable land	1	1	0	0	0
HP8 - Creation of inter-tidal and saline habitat on grassland	7	34	0	0	0
HQ1 - Maintenance of ponds of high wildlife value < 100 sq m	110	0	0	0	367
HQ10 - Restoration of lowland raised bog	6	115	0	0	0
HQ11 - Wetland cutting supplement	65	284	0	0	0
HQ12 - Wetland grazing supplement	99	694	0	0	0
HQ13 - Inundation grassland supplement	6	60	0	0	0
HQ2 - Maintenance of ponds of high wildlife value > 100 sq m	222	0	0	0	827
HQ3 - Maintenance of reedbeds	70	538	0	0	0
HQ4 - Restoration of reedbeds	23	79	0	0	0
HQ5 - Creation of reedbeds	24	69	0	0	0
HQ6 - Maintenance of fen	97	475	0	0	0
HQ7 - Restoration of fen	100	499	0	0	0
HQ8 - Creation of fen	21	112	0	0	0
HQ9 - Maintenance of lowland raised bog	4	50	0	0	0
HR - Hedgerow restoration includes laying, coppicing and gapping up	1 117	0	0	844 289	0
HR1 - Supplement for cattle grazing	354	17 430	0	0	0
HR2 - Supplement for native breeds at risk	245	10 694	0	0	0
HR4 - Supplement for control of invasive plant species	141	1 337	0	0	0
HR5 - Bracken control supplement	139	2 250	0	0	0
HR6 - Supplement for small fields	442	2 071	0	0	0
HR7 - Supplement for difficult sites	191	2 670	0	0	0
HR8 - Supplement for group applications	37	24 221	0	0	0

HSC - Hedgerow supplement - substantial pre- work	195	0	0	127 729	0
HSL - Hedgerow supplement - top binding and/or staking	137	0	0	94 096	0
HTB - Restoration of historic buildings	52	0	0	0	0
ILC - Improved land conversion payment	724	54 707	0	0	0
LFAREGIME - LFA continuation option	1 008	0	0	0	132 204
LHX - Major preparatory work for heathland re-creation or restoration	17	0	0	0	0
LS - Ladder stile	1	0	0	0	2
LSP - Stone gate post	15	0	0	0	142
LWW - Wooden wings for gates	49	0	0	0	243
MT - Planting fruit trees	133	0	0	0	5 819
NR7W - NE internal payment correction	1	0	0	0	1
OA1 - Farm Environment Record (FER)	2 453	272 182	0	0	0
OB1 - Hedgerow management on both sides of hedge	1 147	0	0	4 083 193	0
OB10 - Combined hedge and ditch management (incorporating OB3)	264	0	0	301 608	0
OB11 - Stonewall protection and maintenance	201	0	0	490 563	0
OB2 - Hedgerow management on one side of hedge	1 432	0	0	4 683 384	0
OB3 - Enhanced Hedgerow management	753	0	0	2 454 033	0
OB4 - Stone faced Hedge bank management on both sides	54	0	0	148 929	0
OB5 - Stone faced Hedge bank management on one side	45	0	0	79 222	0
OB6 - Ditch management	418	0	0	471 219	0
OB7 - Half ditch management	179	0	0	183 561	0
OB8 - Combined hedge and ditch management (incorporating OB1)	299	0	0	355 606	0
OB9 - Combined hedge and ditch management (incorporating OB2)	287	0	0	219 518	0
OC1 - Protection of in field trees - rotational land	182	0	0	0	2 062
OC2 - Protection of in field trees - grassland	449	0	0	0	9 889
OC3 - Maintenance of woodland fences	376	0	0	807 590	0
OC4 - Management of wood edges	153	179	0	0	0
OD1 - Maintenance of traditional farm buildings	74	0	25 333	0	0
OD2 - Take archaeological features out of cultivation	25	102	0	0	0
OD3 - Low depth, non-inversion cultivation on archaeological features	12	141	0	0	0
OD4 - Management of scrub on archaeological features	14	416	0	0	0
OD5 - Management of archaeological features on grassland	139	5 308	0	0	0
OE1 - 2m buffer strips on rotational land	58	67	0	0	0
OE2 - 4m buffer strips on rotational land	109	122	0	0	0
OE3 - 6m buffer strips on rotational land	201	507	0	0	0

OE4 - 2m buffer strip on organic grassland	49	47	0	0	0
OE5 - 4m buffer strip on organic grassland	41	39	0	0	0
OE6 - 6m buffer strip on organic grassland	86	128	0	0	0
OE7 - Buffering in-field ponds in organic grassland	24	11	0	0	0
OE8 - Buffering in-field ponds in rotational land	17	8	0	0	0
OES - Special Projects	254	0	0	0	0
OF1 - Field corner management	200	276	0	0	0
OF2 - Wild bird seed mixture	5	5	0	0	0
OF2NR - Wild bird seed mixture	93	103	0	0	0
OF4 - Nectar Flower mixture	75	61	0	0	0
OF6 - Over-wintered stubbles	169	2 110	0	0	0
OF7 - Beetle banks	32	24	0	0	0
OF8 - Skylark plots	13	0	0	0	138
OG1 - Under sown spring cereals	157	2 220	0	0	0
OG2 - Wild bird seed mixture in grassland areas	2	3	0	0	0
OG2NR - Wild bird seed mixture in grassland areas	14	15	0	0	0
OG3 - Nectar flower mixture in grassland areas	7	5	0	0	0
OG4 - Cereals for whole crop silage followed by over-wintered stubbles	33	172	0	0	0
OG5 - Brassica fodder crops followed by over-wintered stubbles	44	500	0	0	0
OH1 - Otter holt - log construction	57	0	0	0	70
OH2 - Otter holt - concrete pipe & chamber construction	19	0	0	0	21
OHC1 - Protection of in-field trees - rotational land (organic)	5	0	0	0	66
OHC2 - Protection of in-field trees - grassland (organic)	20	0	0	0	253
OHC4 - Management of woodland edges (organic)	9	2	0	0	0
OHD1 - Maintenance of traditional farm buildings	7	0	2 996	0	0
OHD2 - Take archaeological features out of cultivation (Org)	35	313	0	0	0
OHD3 - Low depth, non-inversion cultivation on archaeological features	4	72	0	0	0
OHD4 - Management of scrub on archaeological features	15	73	0	0	0
OHD5 - Management of archaeological features on grassland	88	1 371	0	0	0
OHE1 - 2m buffer strips on rotational land (organic)	15	14	0	0	0
OHE2 - 4m buffer strips on rotational land (organic)	17	15	0	0	0
OHE3 - 6m buffer strips on rotational land (organic)	57	265	0	0	0
OHE4 - 2m buffer strip on grassland (organic)	4	1	0	0	0
OHE5 - 4m buffer strip on grassland (organic)	3	1	0	0	0
OHE6 - 6m buffer strip on grassland (organic)	16	27	0	0	0

OHE7 - Buffering in-field ponds in organic grassland (organic)	1	0	0	0	0
OHE8 - Buffering in-field ponds in rotational land (organic)	4	2	0	0	0
OHF1 - Field corner management (organic)	20	35	0	0	0
OHF2NR - Wild bird seed mixture (organic)	29	59	0	0	0
OHF4 - Nectar Flower mixture	27	48	0	0	0
OHF6 - Over-wintered stubbles (organic)	38	623	0	0	0
OHF7 - Beetle banks (organic)	14	4	0	0	0
OHF8 - Skylark plots (organic)	3	0	0	0	24
OHG1 - Under sown spring cereals (organic)	23	334	0	0	0
OHG2NR - Wild bird seed mixture in grassland areas (organic)	6	6	0	0	0
OHG3 - Nectar flower mixture in grassland areas	3	4	0	0	0
OHG4 - Cereals for whole crop silage followed by winter stubble-organic	8	43	0	0	0
OHG5 - Brassica fodder crops followed by over-wintered stubbles (org)	8	69	0	0	0
OHK1 - Take field corners out of management: outside SDA & ML(organic)	7	8	0	0	0
OHK2 - Permanent grassland with low inputs: outside SDA & ML(organic)	24	386	0	0	0
OHK3 - Permanent grassland with very low inputs:outside SDA&ML(organic)	60	753	0	0	0
OHK4 - Manage rush pastures: outside SDA & ML(organic)	3	5	0	0	0
OHK5 - Mixed stocking (organic)	17	764	0	0	0
OHL1 - Field corner management: SDA land(organic)	1	1	0	0	0
OHL2 - Permanent in-bye grassland with low inputs: SDA land(organic)	2	16	0	0	0
OHL3 - In-bye pasture & meadows with very low inputs: SDA land(organic)	17	268	0	0	0
OHL4 - Manage rush pastures: SDA land & ML parcels under 15ha(organic)	2	26	0	0	0
OHL5 - Enclosed rough grazing:SDA land & ML parcels under 15ha(organic)	2	5	0	0	0
OHM1 - Soil management plan (organic) (pre-RDPE)	4	887	0	0	0
OHM2 - Nutrient management plan (organic) (pre-RDPE)	5	855	0	0	0
OHM3 - Manure management plan (organic) (pre-RDPE)	3	524	0	0	0
OJ1 - Management of high erosion risk cultivated land	16	320	0	0	0
OJ2 - Management of maize crops to reduce soil erosion	3	20	0	0	0
OK1 - Take field corners out of management: outside SDA & ML(organic)	63	42	0	0	0
OK2 - Permanent grassland with low inputs: outside SDA & ML(organic)	1 017	20 284	0	0	0
OK3 - Permanent grassland with very low inputs:outside SDA&ML(organic)	771	11 008	0	0	0
OK4 - Manage rush pastures: outside SDA & ML(organic)	56	314	0	0	0
OK5 - Mixed stocking	180	11 730	0	0	0
OL1 - Field corner management: SDA land(organic)	8	8	0	0	0
OL2 - Permanent in-bye grassland with low inputs: SDA land(organic)	113	3 739	0	0	0

OL3 - In-bye pasture & meadows with very low inputs: SDA land(organic)	105	2 565	0	0	0
OL4 - Manage rush pastures: SDA land & ML parcels under 15ha(organic)	36	447	0	0	0
OL5 - Enclosed rough grazing:SDA land & ML parcels under 15ha(organic)	20	336	0	0	0
OM1 - Soil management plan (pre-RDPE)	388	55 101	0	0	0
OM2 - Nutrient management plan (pre-RDPE)	272	40 293	0	0	0
OM3 - Manure management plan (pre-RDPE)	498	71 083	0	0	0
OU1 - Organic Management	2 480	274 431	0	0	0
PAH - Professional help with an implementation plan	330	0	0	0	508
PC - Pond creation - first 100 sq m	143	0	23 955	0	0
PCP - Pond creation > 100 sq m	87	0	90 660	0	0
PH - Hedgerow planting - new hedges	542	0	0	351 480	0
PR - Pond restoration - first 100 sq m	233	0	41 055	0	0
PRP - Pond restoration > 100 sq m	152	0	192 595	0	0
RPD - Cross drains under farm tracks	6	0	0	0	12
RPG - Relocation of gates	6	0	0	0	10
S1 - Soil bund	80	0	0	0	341
S2 - Timber sluice	80	0	0	0	166
S3 - Brick, stone or concrete sluice	41	0	0	0	87
SA - Scrub management < 25% cover	204	1 278	0	0	0
SB - Scrub management 25% - 75% cover	264	1 177	0	0	0
SBB - Bat / Bird box	304	0	0	0	3 858
SBG - Badger gates	6	0	0	0	18
SBS - Bird strike markers	17	0	0	0	24 283
SC - Scrub management > 75% cover	306	743	0	0	0
SCP - Scrape creation > 100m sq	131	0	292 603	0	0
SCR - Scrape creation - first 100m sq	203	0	68 566	0	0
SF - Planting fruit trees	75	0	0	0	2 784
SPR - Special project - revenue	2	36	0	0	0
SS - Scrub Control - Base Payment	508	0	0	0	763
SSM - Small mammal boxes	27	0	0	0	466
ST - Timber stile	75	0	0	0	253
STP - Silt trap provision	4	0	0	0	0
STT - Planting standard parkland/hedgerow tree	160	0	0	0	4 811
TFC - Top fruit orchards conversion payment	39	136	0	0	0
TGS - Parkland tree guard (welded steel)	7	0	0	0	228

TN - Help to prepare Teacher's Info Pack	96	0	0	0	97
TO - Orchard tree guard (tube and mesh)	78	0	0	0	3 907
TOF - Orchard Tree Guard (post and rail)	133	0	0	0	5 075
TP - Parkland tree guard (post and rail/wire)	127	0	0	0	3 045
TR - Spiral rabbit guards	55	0	0	0	57 537
TRE - Tree removal	155	0	0	0	0
TS1 - Tree surgery minor to include minor pollarding	123	0	0	0	1 500
TS2 - Tree Surgery major to include major pollarding	288	0	0	0	4 221
TSP - Planting tree and shrub/ whips and transplants	423	0	0	0	260 098
TT - Tree tube and stake	442	0	0	0	250 525
TW - Stone wall supplement - top wiring	206	0	0	121 614	0
WDC - Creation of ditches (rhines and dykes)	43	0	0	48 378	0
WDI - Drove improvement	3	0	0	0	0
WGC - Creation of gutters	22	0	0	45 707	0
WPS - Construction of water penning structures	12	0	0	0	0
WR - Stone wall restoration	394	0	0	159 130	0
WRD - Stone wall supplement - difficult sites	123	0	0	46 407	0
WRQ - Stone wall supplement - stone from quarry	117	0	0	24 395	0
WRS - Supplement - wall restoration	115	0	0	27 163	0
WS - Water supply	257	0	0	167 090	0
WSS - Step-over stile in stone wall	4	0	0	0	4
WT - Water trough	323	0	0	0	966
WWP - Wind pumps for water level measures	3	0	0	0	0