



# EU POLLINATORS INITIATIVE

A review of Member States actions to tackle the decline of wild pollinators

## FRANCE



STRATEGY



Two national plans  
2016-2020/2018-2028



INITIATIVES



Rural



Urban



Private sector



NATIONAL RED LISTS

Threatened species



6%

Butterflies (2012)



RAISING AWARENESS



Citizens



Schools children



Farmers & beekeepers

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# CONTENTS

<i>Strategies for wild pollinators or any other similar plans</i>	<i>4</i>
<i>Improving knowledge of pollinator decline, its causes and consequences</i>	<i>6</i>
<i>Initiatives tackling the causes of pollinator decline</i>	<i>9</i>
<i>Raising awareness, engaging society-at-large and promoting collaboration</i>	<i>12</i>
<i>References</i>	<i>14</i>

*There are two national action plans focusing specifically on wild bees and pollinators and on diurnal butterflies: a national action plan on bees and wild pollinators (2016-2020) and a national action plan on diurnal butterflies (2018-2028). Eight of the regions have regional strategies based on the national pollinator action plan.*

*The national red list of diurnal butterflies (Rhopalocera) published in 2012 found that 6% of the 253 assessed species are threatened. 14 regional red lists also exist which cover diurnal butterflies (Rhopalocera) and sometimes also moths. Establishing a red list of wild bees and pollinators is foreseen under the National Action Plan but it has not been published yet. There is a wide range of pollinator monitoring schemes in France, many of which are based on citizen science. The institutes/observatories working on wild pollinators also have research activities, while the national agronomic research institute (INRA) also plays a part in advancing research on the topic. However, in general many knowledge gaps remain.*

*The French Rural Development Programmes offer support to farmers to protect pollinators by maintaining species-rich grasslands, restoring abandoned heathlands and extensive grazing lands, and sowing flower-rich field margins or fallow fields. Organic farming is currently carried out on 22% of the farmed area in France, and the RDP supports conversion. The national Ecophyto II plan aims to find non-chemical alternatives to pesticides, including funding for research on integrated pest management.*

*There are a range of examples of actions undertaken in France which contribute to raising awareness and engaging citizens on the issue of wild bees and pollinators, although not all initiatives found are directly aimed at this. Some initiatives target schools, as well as initiatives for higher educational levels. Citizen science schemes were found to be an important route for promoting citizen engagement and understanding of pollinator issues. Private sector initiatives and NGO-managed labels (e.g. Bee Friendly label on consumer products) are also likely to promote citizen awareness and engagement.*



# STRATEGIES FOR WILD POLLINATORS OR ANY OTHER SIMILAR PLANS

The French Ministry in charge of biodiversity issues has set up two national action plans to protect wild pollinators: the 5-year national action plan on bees and wild pollinators and the 10-year national action plan on diurnal butterflies.

## *National action plan on bees and wild pollinators*

The 2016-2020 national action plan on bees and wild pollinators ([‘France Terre de pollinisateurs pour la préservation des abeilles et des insectes pollinisateurs sauvages’](#)) was published in 2016 after a public consultation and started in 2017. The plan explicitly targets bees and pollinators as a functional group, including their interdependency with plant communities and other wildlife.

Its objectives are to safeguard pollinating insects and their pollination services, mainly through reducing the use of plant protection products and increasing wild floral resources available to pollinators. Its strategy includes 19 objectives centred on 3 axes – to improve knowledge, to increase awareness and to improve action. The objectives are expected to be reached through the implementation of a suite of 20 actions. The plan does not include quantified targets but for each action, but clear result indicators are defined.

For each action, the time and resources required are detailed but it is not always clear how some actions will be financed. For a number of actions, the plan is implemented using managing authorities’ or other partners’ staff time and/or resources. For other actions, funding is required. However, national government funding is not currently considered to be sufficient to achieve the goals of the national action plan on wild pollinators<sup>1</sup>.

The environment ministry is leading the implementation of the plan and set up a steering group to follow its implementation. The steering group meets at least once a year and is composed of representatives of the environment ministry, agriculture ministry, farming associations, protected area managers, regional and local public administrations, and other civil society groups. It includes three scientific bodies working on wild pollinators: the national natural history museum (MNHN), the national agronomic research institute (INRA) and the University of Mons in Belgium. A coordinating body – Opie (the office for insects and their environment) - was also appointed. A dedicated [website](#) was set up in late 2018. Finally, partners to the plan include the regional services of the Ministry, regions/departments and municipalities, relevant scientific and technical institutes, sectoral associations (e.g. farmer representatives), environmental NGOs and relevant volunteers’ networks. The Plan is due to be evaluated at the end of its implementation period in 2020.

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<sup>1</sup> Personal communication, Serge Gadoum, Opie, 7 December 2017

[Regional versions](#) of the national action plan for wild bees and pollinators are being implemented in the regions of Nouvelle-Aquitaine, Bretagne, Grand Est, Auvergne-Rhône-Alpes, Hauts-de-France, Bourgogne-France-Comté, Centre Val de Loire and Ile-de-France.

#### *National action plan on diurnal butterflies*

The 2018-2028 national action plan on diurnal butterflies ([‘Plan national d’actions en faveur des papillons de jour’](#)). The objective is this 10-year plan is the protection of 38 butterfly species through specific measures to stop the direct causes of their decline (fertilization, drought, destruction of their habitat, damage to dispersal abilities, pesticides, etc.). As a priority, the plan focuses on species that are threatened and/or protected. The plan foresees 13 actions under 5 main headings: deploy and consolidate regional approaches to butterfly conservation; improve knowledge base; support regional initiatives and networks; strengthen conservation actions and processes; and, increase awareness and build a wide stakeholder community. The plan is set out at national level but aims to instigate/rely on regional implementation actions/initiatives.

In terms of funding, most of the actions will be financed by the responsible national coordinating body and in some cases through budgets of the regional initiatives. Restoration works require complementary financial resources (not specified). One action (training of experts) relies on the French Biodiversity Agency’s training budget.

Further to the experience gathered under a previous national action plan on butterflies, the environment ministry made its regional branch in Auvergne-Rhone-Alpes responsible for its implementation and animation. A steering group of about 20 organisations drawn from the research, public authorities (State services, national institutes) and other relevant stakeholders, oversees the implementation of the plan.

An overall review of actions for pollinators in France up to 2016 is available (Fondation pour la Recherche sur la Biodiversité, 2016).

#### *Cross-border action plan for wild pollinators in Belgium and the north of France 2019-2029*

Stakeholders in the north of France (Haut-de-France) and the Belgian regions published in June 2019 a cross-border action plan for wild pollinators that covers the north of France (Nord Pas de Calais) and Belgium, with support of the SAPOLL Interreg project (Folschweiller et al 2019).

#### *Apiculture plan*

At national level, the 2013-2018 sustainable development plan for the beekeeping sector ([‘Plan de développement durable de l’apiculture’](#)) aimed to improve honeybee health with measures to reduce the impact of pesticides, diseases and non-native species; promote pollinator habitats (notably through the creation of Ecological Focus Areas under Pillar 1 of the CAP); train and facilitate the setting up of new beekeepers; and support research which will assist in the development and re-structuring of French honey production. It was implemented by the agriculture ministry. In February 2019, the ministries of agriculture and of the environment jointly announced the set-up of a [working group](#) to strengthen bee and pollinator protection from the use of pesticides through a stronger regulatory framework.

At the regional level, a number of strategies and protection are in place. These include:

- Certain bumblebee species are legally protected in the region Île-de-France.
- Protection areas which allow only the European Dark Honeybee subspecies (*Apis mellifera mellifera*) have been created in several regions<sup>2</sup> as “mating zones” for queens raised and then distributed to beekeepers. This project by the CNRS aims to boost the presence of this declining sub-species.



# IMPROVING KNOWLEDGE OF POLLINATOR DECLINE, ITS CAUSES AND CONSEQUENCES

## RED LISTS ON POLLINATORS AND DATA ON POLLINATOR POPULATIONS

The national action plan on bees and wild pollinators includes an action to establish a red list of selected key wild pollinators. For this, €4.4 million were made available by the ministry of environment to support citizen science using France’s “investment grant for the future” (programme investissements d’avenir) between 2015 and 2018.

In 2012, IUCN France, with the MNHN, Opie and the Société entomologique de France (SEF) established a [red list of diurnal butterflies](#) (Rhopalocera) (IUCN 2012). It reviewed 253 species of mainland France and concluded that 16 were threatened (i.e. 6%) and 18 (i.e. 7%) were near threatened.

A number of [regional red lists](#) follow the methodology developed by IUCN France:

- diurnal butterflies (Rhopalocera) and moths (Zygaenidae) in Alsace, Auvergne, Bourgogne, Corse, France-Comté, Haute-Normandie, Ile-de-France, Picardie, Poitou-Charentes, Provence-Alpes-Côte d’Azur and Rhone-Alpes.
- diurnal butterflies (Rhopalocera) in Aquitaine, Bretagne and Nord-Pas-de-Calais.

The national action plan on wild bees and pollinators includes an action to consolidate and populate databases on the incidence of pollinators. Resources and databases currently provide public access to data on pollinators, at different geographical scales, as follows:

- A national check list of wild bees in France was published by the Atlas Hymenoptera team in 2017 (Rasmont et al, 2017). [Check lists of wild bees](#) are available for Bretagne, Pays-de-la-Loire, Basse-Normandie, Nouvelle Aquitaine, Franche Comté and Lot.

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<sup>2</sup> e.g. Conservatoire de l’Abeille noire d’Île-de-France (Canif), Conservatoire Pyrénéen de l’Abeille Noire, Conservatoire de l’Abeille noire en Ardèche, en Val de Loire; project “Abeille noire de Chizé” by CNRS de Chizé

- The Bee Observatory ([Observatoire des Abeilles](#)) is an association for the observation and protection of wild bees. Since 2016 they have an agreement with the French government (Service National du Patrimoine Naturel) to develop a national inventory of wild bee species in France, including a system to accept and verify species records, together with Wallonian universities in Belgium, and an atlas of distribution for all mainland regions (départements). They will also develop internet resources (website and information), an academic journal, and training and awareness raising events aimed at the research community.
- The NGO Opie and the Bee Observatory have elaborated a [list of the wild bee species, butterflies and \*Zygaena\* moth species](#) used to define natural areas of ecological, faunal and floristic interest<sup>3</sup> in the Île-de-France region.
- The SAPOLL project, covering Wallonia and Flanders in Belgium and the Haut-de-France region in France is gathering data on pollinators across its territory of action.
- An atlas of the bumblebees of Nord-Pas-de-Calais was produced and published in 2018 by SENF and other partners (Lemoine et al 2018).
- Gretia<sup>4</sup>, a regional observatory body, published the results of a 3-year survey of bumblebees in Basse-Normandie alongside a synthesis of previous historical data dating back to 1897.
- Gretia also updated the regional list of Syrphidae in Basse-Normandie with a view to identify which are of conservation interest and priority.

## POLLINATOR MONITORING SCHEMES

The National Inventory of Natural Heritage ([INPN](#)) managed by the national natural history museum (MNHN) was put in place in France in 2005, in response to a requirement of the Environmental Code (the main legislative text governing environment issues). It is the information system of reference for any data on nature and the environment. It gathers monitoring data dating back from 1979.

The network [Vigie-Nature](#) (part of the MNHN) is the umbrella for a number of citizen science programmes on pollinators:

The [Observatory of Garden Biodiversity](#) gathers citizen science data on butterflies and on bumblebees in private gardens. A citizen science scheme ([Opération Papillons](#)) records the monthly maximum abundance of day-flying Lepidoptera in private gardens. Since 2006, about 1,000 gardens are being monitored per year, and more than 1.6 million butterflies have been counted in 11,500 gardens located across France so far. Another citizen science scheme ([Observatoire des Bourdons](#)) records monthly maximum abundance data of bumblebees (*Bombus* spp) in private gardens. Since 2009, about 400 garden are surveyed per year, a total of 2,200 gardens so far.

The [Spipoll program](#) is a citizen science monitoring scheme of plant pollinator interactions across France. It is an initiative of the MNHN and Opie with the Fondation Nature & Découvertes and Fondation Nicolas Hulot pour la Nature et l'Homme. Since its start in 2010, more than 300,000 [plant-pollinator interactions](#) have been observed thanks to more than 1,300 volunteers. A new website will facilitate collaborative data validation as well as data queries and result presentation for the participants.

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<sup>3</sup> ZNIEFF: Zones naturelles d'intérêt écologique, faunistique et floristique

<sup>4</sup> Groupe d'étude des invertébrés armoricains (GRETIA), active in Bretagne, Pays de la Loire and Normandie.

A butterfly monitoring scheme ([Suivi Temporel des Rhopalocères de France STERF](#)) is organised by the MNHN since 2005. However, there appears to have been a big drop in data contributions in 2018.

A number of other programmes focus on pollinators:

- The national parks collect and publish data on pollinators, for example the National Park of Cévennes monitors butterfly species.
- [FlorAbeilles](#) project maintains the FlorApis database of photographic documentations of honeybee-flower interactions, submitted by observers and validated by registered experts. Another database is being compiled of published scientific observations of wild bee-flower interactions. In June 2016 data were available on flower interactions of 180 bee species. They are managed by the INRA research group Pollinisation et Ecologie des abeilles.
- The website [Lépi Net](#) records which butterfly species (Lepidoptera - macrolepidoptera, Pyralidae, Sesiidae) is present in which region (département) of France and helps amateurs and more confirmed naturalists to identify species. It includes numbers of observations per species and region, based on a mix of literature and expert observations.

## RESEARCH INITIATIVES

- The Bee Observatory group published a report in 2015 that synthesised the available research on the interactions between domestic and wild bees (Vereecken et al 2015).
- The [Pollinéaire project](#) run by the national agriculture research institute INRA with national research funding is developing management strategies to increase the value of linear green spaces associated with transport networks for pollinators.
- The [POLINOV project](#) run by ACTA (Association de Coordination Technique Agricole) is researching the effects of more diverse crop rotations on honeybees and wild pollinators in a region dominated by intensive cereal cropping (Plaine et Val de Sèvres). The project also investigated the causes of wild pollinator and honeybee population decline (Rollin et al, 2013). The research found that solitary bees used the native floral resources in semi-natural habitats (particularly woody habitats in spring and herbaceous habitats in summer) more frequently and in greater abundance compared to honeybees. Solitary bees were also much rarer than honeybees in mass-flowering crops. Bumblebees displayed an intermediate pattern of habitat use. Like honeybees, they occurred less frequently in semi-natural herbaceous habitats compared to mass-flowering crops (oilseed rape, sunflower, alfalfa) and semi-natural woody habitats, but unlike honeybees, they were found at their lowest abundance levels in oilseed rape and sunflower. They had a rather ubiquitous, but low-abundance, distribution pattern. In contrast, bumblebees were abundant in alfalfa.

There are still many knowledge gaps about wild bee species and their food and nesting habits, for example the impact of tillage on ground-nesting bees. Pollinators in the French overseas territories are poorly studied.

## TAXONOMICAL EXPERTS ON POLLINATORS

Staff working for the organisations and associations involved in collecting data on pollinators have taxonomical experts on pollinators. Key organisations working on this topic include MNHN, Opie, the Bee Observatory, the national agronomic research institute INRA, as well as national parks or other protected areas. However, the ministry of environment signals a lack of trained professionals that have the taxonomical knowledge to study wild pollinators and has included an action (action 7) in the national action plan on wild bees and pollinators to this effect. This action will mainly be financed by the ministry of environment and the ministry of agriculture.



# INITIATIVES TACKLING THE CAUSES OF POLLINATOR DECLINE

## ACTION PLANS ON SPECIES AND HABITATS

There are two national action plans focusing directly on wild bees and pollinators and on diurnal butterflies (see section 2).

In addition, more broadly aimed national plans and strategies contribute to pollinator conservation:

- National and regional parks, along with the nature conservatories, have a mission to raise awareness on nature issues, and most of them work on the topic of pollinators.
- The national “green and blue grid” network of green infrastructure includes habitats which contribute to pollinator conservation.

The national plan for the development of agroforestry is expected to increase habitats and food resources for wild pollinators on agricultural land.

## FARMER AND LANDSCAPE INITIATIVES, AS WELL AS LOCAL LEVEL STRATEGIES

The French Rural Development Programmes offer support for the following agri-environment measures that are expected to directly or indirectly benefit pollinators in the 2014 to 2020 period:

- maintenance of semi-natural flower-rich hay meadows (HERBE\_07)
- late mowing on remarkable meadows and habitats (HERBE\_06)
- Improved pastoral management of mosaic habitats (avoiding overgrazing or under grazing with pastoral management plan, no pesticide use) (HERBE\_09)

- Re-open abandoned habitat (OUVERT\_01) and maintain open habitat through by cutting or manual removal of woody and unwanted vegetation (OUVERT\_02) – targeted to natural meadows, rangelands, heathland
- sow field strips or fallow with seed mixes for biodiversity interest and maintain for 5 years (locally defined cover, no pesticide use) (COUVER-06)
- sow arable fallow with seed mixes for specific species (eg pollinators or birds) and maintain cover for 5 years (non-intervention between mid- April and end July, ban/limits on use of pesticides and fertilisers) (COUVER\_07)
- establish 1 to 4 beehives in area of interest for biodiversity (API)

French stakeholders, including businesses and public authorities (protected area managers, cities or administrative units), are performing well in promoting pollinator friendly habitats, as shown by the wealth of initiatives identified. Key actions include the maintenance of flowering meadows, flowering field edges and implementing rotational mowing to increase food and nesting resources for pollinators. Pollinator-friendly habitats are also being promoted in urban areas.

There are national and regional initiatives in protected areas, and on public land on the road and electricity infrastructure networks, and in urban areas:

- Several **national and regional parks** have adopted specific measures to promote pollinators, such as habitat restoration, and defined requirements for honeybee hive siting to avoid competition pressure between managed and wild bees.  
The Ministry of Environment, Department of transport infrastructure (Direction des Infrastructures de Transport) is leading an initiative that aims to the adoption of a regime of late mowing of road verges and to use green spaces linked to roads as flowering fallows (e.g. verges, side ditches, traffic islands - dépendances vertes), with a view to help protect wild pollinators. The programme was adopted following a 3-year pilot project by the ministry of the environment and following the recommendation of a national study on management techniques for supporting pollinators on road verges (Chagué and Bagnis, 2014). These actions are included in the NAP on wild bees and pollinators.
- The State-owned national road network [committed to late mowing](#) in 2016 on the 12,000 km of road network in France. The regions are being encouraged to apply similar practices on their regional road networks, as are the SNCF for the national railway network.
- Since 2011, the national electricity grid (RTE -Réseau de Transport d'Electricité) has a project called «[National electricity grid initiative](#)” to support pollinator insects. In partnership with [Noé Conservation](#), it establishes flowering meadows and nectar-rich openings in forests, while also trying to reduce its plant protection product use. Since the NAP on wild bees and pollinators has been in place, RTE is supporting three actions: to support scientific studies on wild pollinators, to produce guidance and technical fiches, and to increase the floral resources available to pollinators by planting wild local flowering plant species. [RTE aims to get the “Jardin de Noé” label](#) for some of its sites which the organisation aims to turn into biodiversity refuges.
- The Département of Pas-de-Calais and the Conservatoire d’espaces naturels Nord-Pas-de-Calais, alongside other partners, are taking part in the EU-funded SAPOLL project to improve management of public land for pollinators, with co-funding from the Region Hauts-de-France (see Belgium fiche for more details). The Nord – Pas-de-Calais public land office (Etablissement

Public Foncier) has adopted a set of [good practices for managing urban brownfield sites for pollinators](#) (Guillaume, 2016).

- The LIFE-funded project [URBANBEES](#) (2010-2015) developed an action plan for wild bees in urban areas, and tested and adapted it in the urban region of Lyon. It included abundance monitoring of wild bees in the urban environment (Fortel et al, 2014), the testing of nesting devices (Fortel et al, 2016), changes to the conventional management of parks and other green spaces to favour the return of native local plants and animals, and methods to tackle invasive alien species. The project produced a [management guide for how to conserve wild pollinators and other nature in towns and cities](#), and a touring exhibition.

## MEASURES ON PESTICIDES

The national [Ecophyto II+ plan](#) aims to find non-chemical alternatives to pesticides, including funding for research on integrated pest management. The Ecophyto II+ plan cross-references the national pollinator strategy. The plan sets a national target of reducing pesticide use by 50% by 2025 (measured in weight) compared to 2020. The revised use reduction target follows two previous targets which have not been reached. Pesticide use in France is still at a high level.

Since 2017, public entities cannot use pesticides in all publicly accessible green spaces ([loi n°2015-992 of 17 August 2015](#)); and since 1 January 2019, the sales of pesticides is banned to individuals ([«loi Labbé» of 6 February 2014](#)). The City of Strasbourg pioneered a ban the use of pesticides in public areas in 2008 with its [Zero Pesticides Initiative](#). Along with awareness campaigns and guidance documents for citizens, pollinator-friendly techniques were encouraged (Wilk et al. 2019).

The French Rural Development Programmes (RDPs) (2014 to 2020) offer funding for farmers to reduce or stop herbicide use through a suite of 16 types of agri-environment operations (“PHYTO1-16”) covering arable crops, field vegetable production, horticulture, fruit production and viticulture. The RDPs also support the conversion from conventional to organic farming, which is currently carried out on 22% of the farmed area in France.



# RAISING AWARENESS, ENGAGING SOCIETY-AT-LARGE AND PROMOTING COLLABORATION

## TRAINING AND AWARENESS RAISING CAMPAIGNS

The national action plan on wild pollinators includes an action to support communication initiatives aimed at raising the awareness of a wide audience about wild pollinator insects. It also includes an action on training future professionals to study and consider wild pollinators, with co-financing by INRA, the ministry of agriculture and the ministry of education.

The National Action Plan on diurnal butterflies includes an action (action 13) on training of professional staff involved in nature conservation about on diurnal butterflies. The action targets both staff in managing authorities and relevant agencies/institutes but also other professionals such as farmers, foresters, urban planners, etc.

More broadly, the first volume of the French assessment of ecosystems and ecosystem services, published in late 2016, was dedicated to pollination (Beyou et al 2016). It drew attention to the dependence of French agriculture on pollination, and the monetary value this represents.

Some initiatives aimed at farmers and other land managers:

- [Concours des pratiques agro-écologiques prairies et parcours](#): Since 2010, following an initiative by national and regional parks, farmers can compete in the nation-wide contest on flowering meadows. Farmers are awarded for agriculture management practices of pastures and meadows that promote a balance of agricultural and ecological performance. Contribution to biodiversity including wild pollinators and floral diversity are criteria.
- The Agrifaune programme trains and raises awareness among farmers for more environment-friendly practices including for pollinators. The programme is run by the regional committees of agriculture, the national hunting and wildlife agency, and the national hunter federation.
- The [Observatoire Agricole de la Biodiversité](#) (OAB) offers farmers simple biodiversity guidance to help them recognise and help beneficial insects on their land, including how to carry out a butterfly transect and how to set up a solitary bee nesting box.
- The NGO Opie runs a professional training programme on wild pollinator identification (Hymenoptera, Lepidoptera, Syrphidae) and regularly gives seminars to university students on wild pollinators and pollination and the national action plan. Opie have run workshops on the national action plan for national protected area managers. It also organises [training courses](#) for individuals.
- The national federation of botanical gardens published recommendations on sourcing planting material of wild native species of local origin in 2017 (FCBN 2017).

- Several national and regional parks have defined requirements for honeybee hive siting to avoid competition pressure between managed and wild bees. The Centre for Studies and Expertise on Risks, Environment, Mobility and Development (CEREMA) published a number of reports and guidance documents on how to take into account environmental issues, notably biodiversity, into territorial planning. This includes two reports on road network green spaces management ([phase 1](#) and [phase 2](#)) (using the lessons from the 3 year pilot project on wild pollinators) and a [report on biodiversity and road infrastructures](#).

## EDUCATIONAL CAMPAIGNS AND MATERIALS ON WILD POLLINATORS

- The inter-professional association of seeds and the French horticulture professional association offer materials and tips to school teachers as part of their “[gardening in schools](#)” initiative. One of the actions proposed is to educate children about pollination by [growing pollinator friendly plants](#).
- The [Apicool association](#) aims to raise awareness about bees and pollinators, notably in schools, in the Grand-Est region. It selected 5 VIP (Very Important Pollinisateur) schools which will set up and evaluate of a site dedicated to pollinator insects. The objective is to produce a guidance to schoolteachers. This project receives funding from the regional department of the ministry of agriculture and is part of the Grand-Est regional plan on pollinators.
- The [Bee Observatory Apiformes network](#) integrates learning on pollinators and their requirements into 25 agricultural high schools. Opie run workshops for the agriculture academy. The ministry of agriculture technology network [pollination working group](#) is developing management practices and agricultural systems that benefit pollinators. In a citizen science campaign, twenty French agricultural high schools collected bees, which were identified to species level by a panel of expert bee taxonomists (Le Féon et al, 2016).
- The Parc Zoologique d'Amiens Métropole, the Parc Animalier de Sainte-Croix, the Parc Zoologique d'Amiens Métropole, the Parc Zoologique de Montpellier, Planète Sauvage, Parc Zoo du Reynou, Lyon Zoo, Zoodyssée and La Vallée des Singes took part in the EU Pollinators communication campaign for primary school children in 2019.

## CITIZEN ENGAGEMENT CAMPAIGNS

There are several pollinator monitoring schemes in France which rely on citizen science. These have been accompanied by campaigns and actions aimed at citizen engagement on the issue. For example, the [Conservatoire d'espaces naturels from the \(ex-\)Nord-Pas-de-Calais region](#) employs staff to engage with citizens to demonstrate the value and educate them about citizen participation in biodiversity monitoring, and thereby contribute to the Vigie Nature citizen network. See the section on pollinator monitoring for more information.

## PRIVATE SECTOR INITIATIVES FOR WILD POLLINATORS

Several private companies have environmental committees who work on the topic of pollination and raise awareness of employees on site or off site, for example in schools (Agnes Halloserie, personal communication).

- The national union of aggregates producers (UNPG) have produced a [guide to managing sand quarries to benefit solitary bees](#).

## APICULTURE SECTOR INITIATIVES FOR WILD POLLINATORS

The [Bee Friendly label](#) is developed, managed, and secured by the BEE FRIENDLY Association (created in 2011) bringing together European organizations of beekeepers. It is used by the French national beekeepers association and is recognized by the ministry of agriculture since 2013. It sets out requirements for different types of products (dairy products, fruit and veg, cosmetics, etc.) that protect domestic honeybees as well as pollinators more widely. It defines 27 measurable criteria, a list of qualifying practices and 3 skill levels corresponding to the successive stages of an improvement process to bee-friendly production systems.

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## Educational materials

### Agronomy students

In an expert-assisted citizen science programme from 2009 to 2011, students from 20 French agricultural high schools collected bees, which were identified to species level by a panel of expert bee taxonomists (Le Feon et al 2016). The students carried out a standardized survey method which involved setting out standard pan traps for one 24-hour period every month from March to October. At the onset of the programme, all the participants followed a 5-day course on bee biology and systematics provided by scientists and bee experts, and which included training on techniques to prepare specimens recovered from pan traps and identification to genus level. Afterwards, all bees caught were pinned, labelled and pre-identified to genus by the students and teachers, centralized and double-checked at the coordinating research centre (INRA Avignon), and then sent to a panel of expert bee taxonomists to be identified to species level. The dataset was compared with data freely available at a national scale on agriculture intensity and landscape composition to draw conclusions about the impacts on wild bees.

### **Schoolchildren**

- Attirer les insectes pollinisateurs: Fiche élèves as part of “Gardening in schools” initiative. Language: French. At <https://www.jardinons-alecole.org/index.php?lg=fr&alias=activite-classe-attirer-les-insectes-pollinisateurs.html&spec=activite&numpage=708&numfamille=104&numtag=3>
- Apicool schools project – NB materials only available upon fee. <http://apicool.org/ecole-vip/>

### **Land managers**

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