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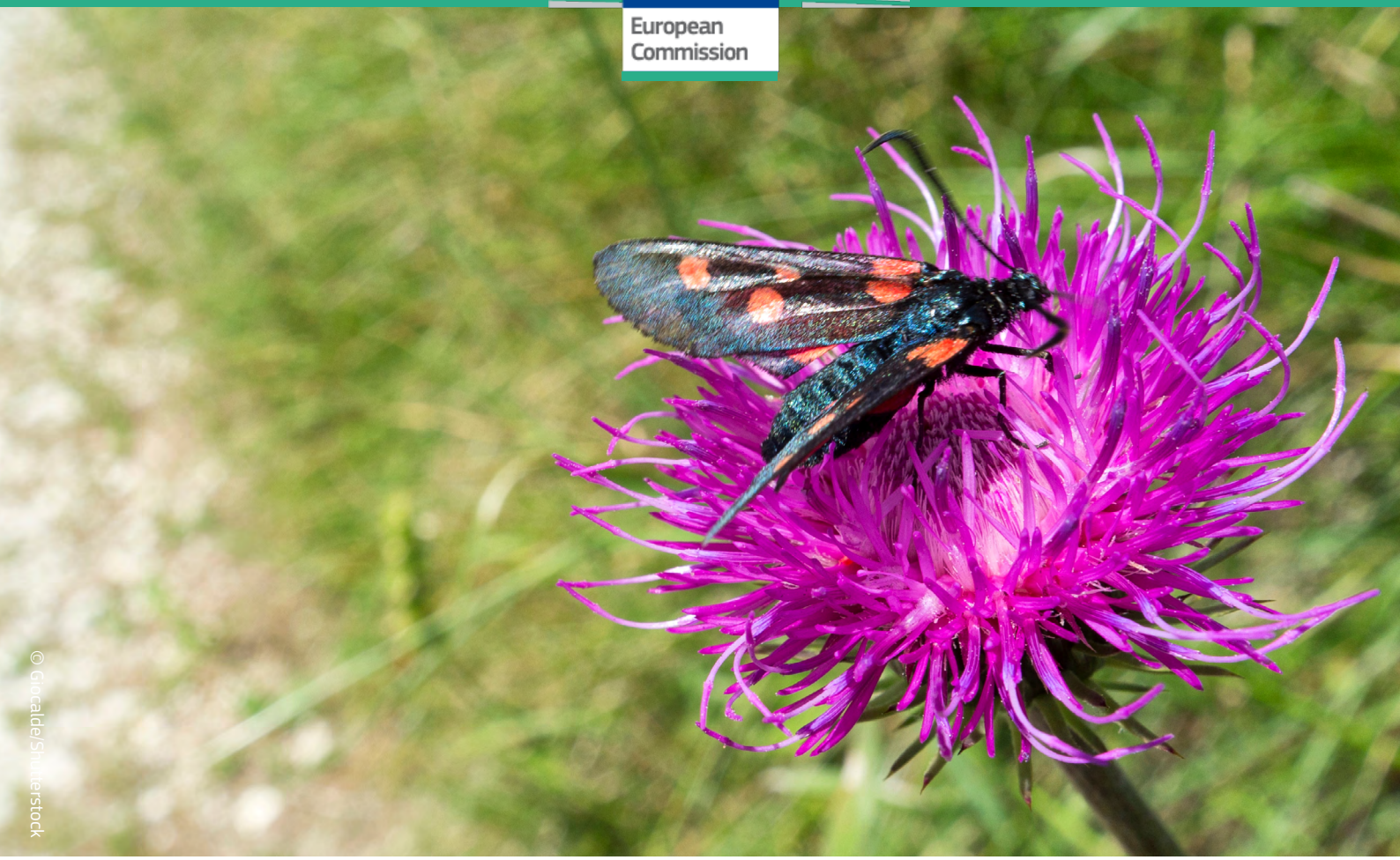

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Business and nature working together:

action by the landscape architecture sector to protect wild pollinators

Environment

Business and nature working together: **action by the landscape architecture sector to protect wild pollinators**

More information: https://ec.europa.eu/environment/biodiversity/business/index_en.htm

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Table of content

Business and nature working together: **Action by the landscape architecture sector to protect wild pollinators**

Why this guidance?

This guidance document for businesses is part of the broader implementation of the EU Pollinators Initiative[1]. The initiative was adopted by the European Commission (EC) on 1 June 2018, setting the framework for an integrated approach to address the decline of pollinators in Europe through three priorities:

1. Improving knowledge on the decline of pollinators, its causes and consequences;
2. Tackling the causes of such decline;
3. Raising awareness, engaging society and promoting collaboration.

One of the important actions of the initiative is to encourage and enable the business sector to take action for wild pollinators.

This document aims to provide such guidelines to businesses that are involved in landscaping, such as landscape architects, spatial planners[2], contractors and managers of land use, infrastructure (i.e. roads, railways) and waterways. The scope of this guidance includes both local actions (i.e. site-specific) and measures across the value chain that can contribute towards the conservation and restoration of wild pollinator populations. The guidance document also informs businesses about the risks that stem from the decline of wild pollinators, and opportunities that arise from taking action to reverse this negative trend.

Pollinators – such as bees, hoverflies, moths, butterflies ans beetles – are declining dramatically around the world, and Europe is no exception. With pollinator populations bein essential in underpinning the stability of pollinator services over time, this decline of pollinators puts managed and natural ecosystems functioning at risk.

Why should your business care?

The landscape sector has plenty of opportunities to minimize its impact on biodiversity and contribute to ecosystem restoration and the creation of new habitats. Restoring pollinator populations to healthy levels will help to bring people in contact with nature, resulting in an increased attraction of the site for tourists and an increased value for the real estate market.

Businesses involved in landscaping can promote the design and management of spaces in a way that it provides multiple ecosystem services, while improving quality of life and supporting a green economy. Green infrastructure can be used by developers to increase land value or to protect assets from the impact of climate change given the carbon storage, erosion and flood control services of many ecosystems.

Managing for pollinators can provide cost-effective solutions to grounds maintenance, engagement with community groups and individuals, whilst also resulting in a visually pleasing and ecologically valuable townscape and countryside.

[1] COM(2018), 395 final, https:// eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528213737113&uri=CELEX:52018DC0395
[2] Also see Pollinator guidance for spatial planners and land use managers by Wilk (2019)

What can your business do?

The sector is well placed to seize opportunities and act positively and effectively for wild pollinator populations. This guidance provides recommendations for action by this business sector to protect wild pollinators illustrated with examples of companies taking the lead in creating opportunities for both the sector and pollinators. The landscape sector should:

- integrate green infrastructure into the early stages of the design process of a project, considering:
  - to recognize existing sources of food and shelter for pollinators on the project site, preserve them, and if necessary, strengthen their natural value to obtain a higher quality;
  - to identify locations where new habitats can be created to help pollinator populations, including green corridors;
  - to include green belts and green corridors when planning traffic verges, road side and railway verges, roundabouts, water ways and river banks;
  - to install biodivers green roofs and walls, and providing sufficient nesting habitat in the vicinity (e.g. dead wood);
  - to nurture contact between people and nature and provide educational opportunities by inclusion of play spaces and community facilities together with the wildlife areas;
  - how to manage the site after construction in a pollinator-friendly way;
- make a well-considered choice of plant species, considering the importance of the plant species for pollinators, and avoiding invasive alien species;
- choose to mimic nature in its designs instead of traditional landscaping with monoculture lawns;
- promote actions to ensure healthy pollinator populations within the value chain;
- raise awareness of the role of pollinators to its stakeholders and encourage them to partake in actions that promote pollinator conservation (e.g. selecting native pollinator-friendly planting material);
- appoint estate managers with good communication skills and an aptitude for community engagement to explain the value of habitats on site to residents;
- monitor and evaluate the impacts of actions on wild pollinators;
- partner up with NGOs, local nature authorities and/or biodiversity experts when drafting, implementing and evaluating actions for pollinators, whether they focus on company's site or the supply chain.


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1. WHAT YOU AS A BUSINESS MANAGER SHOULD KNOW ABOUT POLLINATORS

Clytus Arietis © Johan Lammerant

Pollinator populations are essential to underpin the stability of pollination[3] services in the short- and long-term. Indeed, without pollinators, a large majority of flowering plants will not be able to reproduce and eventually will decline, causing serious cascading effects across ecosystems and business value chains. Many fruits, nuts and vegetables will be lost from our diets, but also other important raw materials and products, such as vegetable oils, cotton and flax, plant-based pharmaceutical and cosmetic products. In essence, pollinators play a crucial role in maintaining terrestrial ecosystems healthy and resilient, which in turn deliver essential services to our businesses and society at large.

Pollinators – such as bees, hoverflies, moths, butterflies and beetles (Figure 1) – are declining dramatically around the world, and Europe is no exception [1, 2]. Many species are threatened with extinction creating a pollination deficit [3]. This puts managed and natural ecosystems functioning at risk, with businesses facing possible serious shortages of raw materials, a decline in crop quality and challenges with the security of the supply chain.

Figure 1. A snapshot of the diversity of wild pollinators

In addition to the impact on farmers' crops, the loss of wild pollinators will also lead to serious problems in terms of the benefits to society that our already fragile ecosystems are delivering. The reduced growth of specific pollinator-dependent vegetation on a mountain slope, for example, could lead to an increased erosion effect or flooding. To maintain our ecosystems and landscapes healthy, wild pollinators are crucial allies. Indeed, we rely on wild pollinators for very important services in maintaining our ecosystems. There are no alternatives to species rich communities, and both businesses and society should therefore increase their efforts for the protection and restoring of wild pollinator populations.

[3] Pollination is the transfer of grains of pollen between flowers which enables the reproduction of flowering plants (both wild and domesticated). Without animal pollinators, many plants cannot set seed and reproduce. When humans benefit directly from this function, pollinators thereby deliver a free pollination service.

Differences between honey bees and wild bees

In addressing this challenge, it is essential to understand the difference between wild bees and honey bees. Honey bees and wild bees are often both included when bee conservation and campaigns are conducted. Obviously, the two have much in common, however, there are key differences. Conversely, thre are around 2,000 bee species in Europe and the honey bee (the only species that produces honey) is just one of them.


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- Although some feral honey bee colonies can be found, most honey bee colonies, which contain thousands of bees, are bred by beekeepers (managed honey bees) for the production of honey and other products. Therefore, honey bee occurence and density depend on the locations of bee hives; which is determined by beekeepers.
- Honeybees are generalists, feeding on many different types of flowers available around the beehive.
- Some wild bees are generalists, whilst others are specialists and exclusively feed from one or a small number of flowering plant species.
- Wild bees usually occur in lower densities, but due to their species variety have a much more diverse ecological role: they feed and make their nests in many different habitats.
- Several crops and flowers (such as legumes) can only be pollinated by specific wild bees.
- Some wild bees such as bumblebees live in small colonies (of ≈50-200), but most are solitary animals without a colony.

In general, wild bees are more effective and efficient pollinators than honey bees [5,6] and they provide the service for free. In fact, high honey bee density can negatively impact wild pollinators including pollinator-plant networks [4].Honey bees have a role to play, but maintaining a species-rich pollinator community is critical for a sustainable pollination service.

Diversity in species ensures that plants will be pollinated even in cases where certain species fail to perform or when populations are too small to effectively pollinate. It enables resilience to the ever-changing environments and acts as a buffer for unforeseen or uncertain future major changes, especially in the context of climate change.

1.1 Landscape sector and pollinators

Landscape changes can have a significant impact on the loss of biodiversity in general and the disappearing of pollinator habitats specifically. However, they also present major opportunities for preserving and restoring natural habitat. For example, field margins can be a major refuge for many insect pollinators, providing foraging and nesting sites, larval food plants and nectar that may be less available on surrounding intensively managed, often monoculture, homogenous farmland. Creating and managing species-rich grassland is also a significant way to improve the biodiversity value of road verges and reduce long-term management costs. Verges rich in native wildflowers support more wildlife, are more resilient to environmental change, enhance ecological connectivity and provide better ecosystem services such as pollination. When maintained through a cyclical management regime with reduced mowing frequencies, grassland verges provide a cost-effective

[3] https://www.plantlife.org.uk/application/files/3315/7063/5411/Managing_grassland_road_verges_Singles.pdf

management option [7] and represent an important opportunity to realize the benefits of enhanced 'Natural Capital'.

Landscape architects and planners have an important role to play, with ample opportunities to enhance the multifunctionality of spaces, thereby also catering for biodiversity and pollinators. Businesses involved in landscaping can promote the design that mimics nature and manages spaces in a way that it provides multiple ecosystem services, while improving quality of life and supporting a green economy. With the inclusion of green infrastructure[5], the sector can contribute to the protection of biodiversity and enhance the ability of ecosystems to deliver multiple services such as disaster prevention, regulation of water flows (e.g. preventing floods), water purification, air quality, pollination, provision of recreation possibilities, climate control and many others. Specifically, for pollinators, landscape design can include the creation of vibrant pollinator habitats to reduce pressures on pollinators and boost pollinator diversity and the benefits they deliver.


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Investing in green infrastructure and taking action for pollinator populations can bring great returns for the private sector. Green infrastructure can be used by developers to increase land value or to protect assets from the impact of climate change given the carbon storage, erosion and flood control services of many ecosystems. For example, a 2014 study [8] on the economic and social benefits of environmental protection showed that investing in flood protection typically returns benefits 6-8 times the costs, with green infrastructure projects potentially delivering significant environmental benefits as well as cost savings. In addition, green infrastructure also provides great financing opportunities linked to innovation (such as innovative planning approaches, the design of urban elements enhancing biodiversity, technologies enhancing ecosystem services...) and can create an added value for the property and for real estate adjacent to green, and attract tourism.
Also, by adopting appropriate management practices, the sector can help to support pollinators in both rural and urban areas. Managing for pollinators can provide cost-effective solutions to grounds maintenance, engagement with community groups and individuals, whilst also resulting in a visually pleasing and ecologically valuable townscape and countryside.


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[5] Green infrastructure is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life. It also supports a green economy, creates job opportunities and enhances biodiversity. (https://ec.europa.eu/environment/nature/ecosystems/index_en.htm)

There is a clear link between landscape design and other players such as (horticultural) farmers, tourists, forestry etc. More information on specific actions for pollinators for these sectors can be found in the guidance documents specifically developed for this purpose, to which reference is made in Chapter 5.

1.2 Site and value chain impacts

Any business is a value chain as is shown in Figure 1 with environmental and social impacts occurring across the value chain.

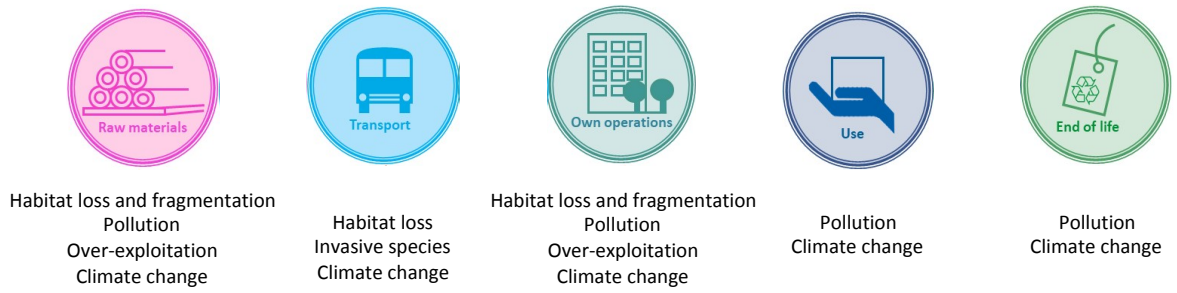


Figure 1. Value chain link with key drivers of biodiversity loss

As companies are being pressed to account for those impacts, they are turning to their supply chain to disclose information in order to monitor and reduce impacts. This includes keeping track of where materials come from, under what conditions they are mined or manufactured, where and how things are made, how products are packaged, transported, used and disposed of. This information is subject to scrutiny by stakeholders, investors and regulators alike [9].

Understanding the full environmental footprint behind products has become a critical challenge for the private sector and associated players such as manufacturers and retailers. Advances in accounting and reporting methodologies will enable companies to identify suppliers that perform best on reducing resource dependence, social and environmental impacts. This will allow companies to encourage suppliers to cost-effectively manage risk and opportunity in their own supply chains and product development [9].

The landscape sector relies on its value chain when introducing new planting material[6] and managing the landscape, in which also transportation of products and soil takes an important role. Many landscaping projects include the removal or addition of soil, which is an important vector of multiple effects on pollinators and biodiversity such as the transport of invasive alien species, pesticides and/or heavy metals that are harmful to pollinators into new areas[7], and the sourcing of materials from peatlands or other important pollinator habitats in the wild.

[6] Arcadis Belgium. (2020). Business and nature working together: Action by the building sector to protect wild pollinators.
[7] https:// circabc.europa.eu/sd/a/96fbf64a-c3e8-49ab-bb5f-efb6cdc16e85/Legal%20provisions%20on%20soil%20import.pdf

2. WHY DO POLLINATORS MATTER TO YOUR BUSINESS?

Declining trends in overall ecosystem health should be of direct concern to businesses not only because many depend on related services, either directly or indirectly, but also because the degradation of ecosystems can present some of the following risks: operational, regulatory and legislation, marketing and reputation, financial and societal. In addition to tackling the risks, opportunities can also emerge. Managing a business at any value chain level and the ecosystem services involved implies evaluating risks and opportunities against these various aspects of running a business. Table 1 shows the risks and opportunities that are relevant for the landscape sector.

Importantly, the sector is well placed to act positively and effectively for wild pollinator populations and the companies and actors involved in the landscape sector can reverse pollinator decline into a broad range of opportunities.

Highways England partners in the "Get Cumbria Buzzing!" Initiative to improve grassland habitat for pollinating insects along the grassy edges of the A590 motorway.

Interested in how pairing up with a local NGO can benefit your company? See Chapter 4

Cathal O'Meara Landscape Architects developed the Floral Mile, the largest urban meadow in the country, forming a vibrant, contemporary approach to planting.

Interested in what your business can do? See Chapter 3

The HHNK works together with a group of agricultural members of a local collective to apply an innovative cutting method with winding cutting paths on one of the dikes under their management. This gives more plants the opportunity to take root, creating a greater variety of species and a better insect habitat.

Interested in what other front-runners are doing? See Chapter 4

Table 1. **Why** pollinating insects matters to your business and **what** to do (risks & opportunities for the horticulture sector that are of key importance and sector-specific are highlighted in **bold**).

	Risks	Opportunities
Operational Regular business activities, expenditures, and processes	▸ Reduced value of land and property where no attention has been given to the multifunctionality of green infrastructure, contributing to the protection of wild pollinators. ▸ The loss of pollinators can lead to impacts throughout the ecosystem, which can lead to other effects such as flooding risks, drought, etc.	▸ Increased value of land and property. Living and working environments that score high on green infrastructure more easily attract buyers, tenants and employees. Pollinators are a good indicator of a healthy nature/ecosystem, so by paying attention to them, the sector can address the dimension of nature in properties. ▸ Differentiating the business to key customers who demand strong sustainability commitments paying attention to the added value for pollinators, in an increasingly competitive market. ▸ Provision of other ecosystem services and associated benefits, e.g. by linking water and carbon management with pollinator-friendly actions, such as green roofs or water infiltration basins, reducing local problems such as flooding risks.
Legal and regulatory Laws, public policies, and regulations that affect business performance	▸ New pollinator strategies, including legislative elements and criteria for procurement. ▸ Increased compliance costs (e.g. due to future ban on the use of planning permission).	▸ Reduce compliance costs and/or other costs by: a. being proactive on compensation measures; b. anticipating negative impacts; c. embedding pollinator risk idenification within the supply chain management and certification schemes (e.g. ISO14001). d. increased acceptance for a project from local communities, authorities and stakeholders. ▸ Convince government agencies to develop policies and incentives to protect or restore ecosystems upon which a company depends.
Financing Costs of and access to capital including debt and equity	▸ Increased financing costs (higher interest rates or harsher conditions), due to increased focus of the finance sector on how businesses in which they invest are dependent on ecosystems services such as pollination.	▸ Gain or maintain investor interest and confidence, which can improve access to finance and/or reduce financing costs. ▸ New «green funds» and associated initiatives may become available in some cases. ▸ New environmental markets might emerge (e.g. carbon offsets, habitat credits etc.).
Reputational and marketing Company trust and relationships with direct business stakeholders	▸ Changing customer values or preferences may lead to reduced market share. ▸ Increased staff turnover, which in turn leads to higher recruitment and retention costs.	▸ Maintain a good relationship with direct business stakeholders, such as customers, suppliers and employees. ▸ Improve physical and mental wellbeing of employees. ▸ Improve ability to attract and retain employees. ▸ Emerging environmental markets and products may offer new revenue streams (e.g. carbon offsets, habitat banking etc.). ▸ Attract tourism.
Societal Relationships with the wider society	▸ Design of public spaces impacts the community that uses it. Design that mimics nature will also facilitate social interaction and cohesion. Otherwise, there is a risk of alienation in the community. ▸ Local communities may hold the landscape architecture sector responsible for the decline of wild pollinators and the loss of benefits they provide to the society.	▸ Increased sense of community in neighborhoods that are revitalised by joint pollinator conservation actions. ▸ Local communities may benefit from other improved ecosystem services that come along with the implementation of pollinator-friendly measures, e.g. through improved recreational access to green areas, cleaner air and imrpoved regulation of water flows.

3. WHAT CAN YOUR BUSINESS DO?

To avoid the risks and meet the opportunities that are described above (see Chapter 2), it is important for the landscape sector to take measures to improve the state of pollinators.

Chapter 3.1 describes the strategic actions that a business can take to integrate biodiversity into its daily operations. In Chapter 3.2 focus is on the actions that can be taken on project sites, in order to develop buildings and spaces to the benefit of pollinators and biodiversity more generally. In addition to the benefits for biodiversity, this may also lead to the provision of other ecosystem services and associated business benefits (for example by linking water management with water-related ecosystem services by implementation of green roofs). Of course, businesses should also consider including pollinator-friendly measures on their own company's premises. Such measures not only provide biodiversity benefit, but also improve the physical and mental wellbeing of employees through the creation of a green space. In Chapter 3.3 focus is on actions that can be taken in the context of the value chain.

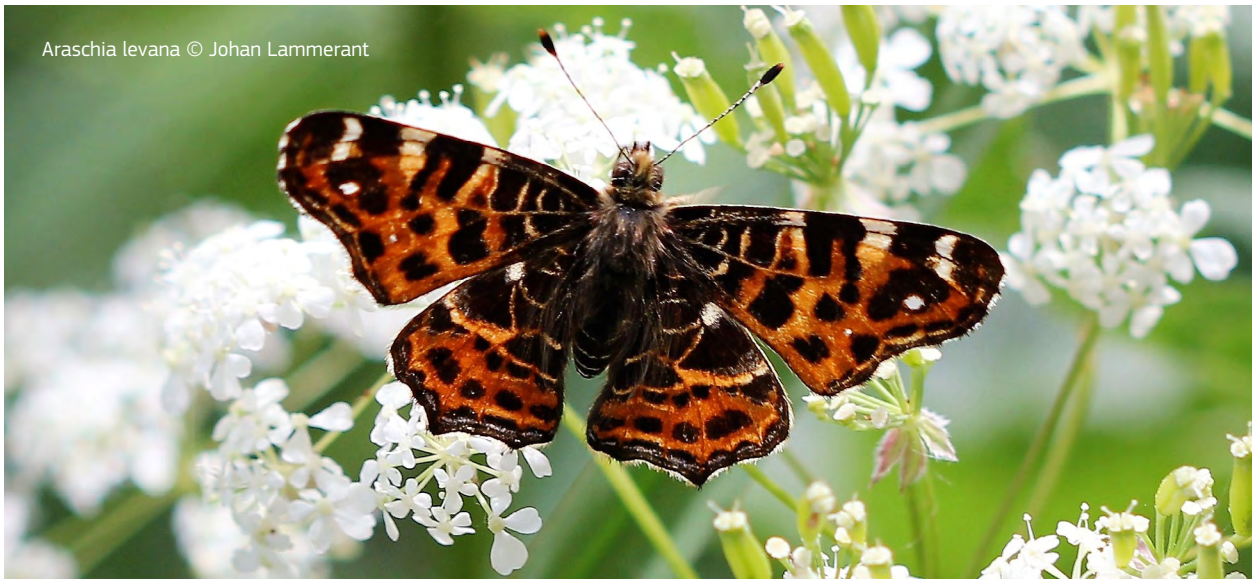
3.1 Strategic actions

A significant step for the landscape sector is to integrate biodiversity into the companies' core business strategies. The sector may therefore capitalize on the associated opportunities while setting and working towards commitments to minimize its impact on wild pollinator populations and wider biodiversity. This commitment will help companies to maximise opportunities to make a positive contribution to the protection of biodiversity and ecosystem services in which pollinators and their habitat play an important role. This is fundamental to the long-term health of the business and the wider society in which it operates.

When developing buildings and their surrounding landscape, several frameworks for environmental and sustainability performance are used throughout Europe, often including rating tools and independent certification schemes. Well known are BREEAM[8], DGNB[9], HQE[10], LEED[11], ... These standards provide guidance and a framework for comparing and evaluating whether a building or landscape project can be regarded as sustainable and biodiversity-caring. In all these methodologies, the integration of green infrastructure is rewarded in the scoring, through different requirements or methods. In some cases, these methodologies can be differentiated according to the scale on which they apply (building scale, larger project development scale).

By considering green infrastructure in landscaping projects, areas become more attractive to residents, employees and visitors, and developers can achieve financial savings through reduced mowing regimes and planting costs when opting for spontaneous nature development.

In addition, the landscape architecture sector can play a big role in upscaling the actions for pollinator-friendly landscapes through a well-considered selection of plant and tree species (opting for pollinator-friendly, pesticide-free, native, non-invasive species), the treatment of soil and approaches for maintenance etc. This is especially the case when working at an extensive landscape scale, for example for governments at local and regional level.


Araschia levana © Johan Lammerant

[8] www.breeam.org
[9] www.dgnb.de
[10] www.assohqe.org
[11] https://www.usgbc.org/leed

3.2 Design pollinator-friendly landscapes

To be most effective, green infrastructure and pollinator-friendly actions need to be integrated into the design or development of the project from the early stages. Indeed, if green infrastructure and the impact on wild pollinator populations is considered early in the design process, then it can provide multiple benefits for the site, as well as make construction easier and more cost effective. Also, and importantly, valuable natural elements can be identified before the works start, thereby being preserved, thus leading to reducing negative impacts.

Landscape architects and spatial planners can play a vital role in the conservation of wild pollinator species, including the protection and enhancement of pollinator populations and habitats. They can stimulate the conservation and enlargement of pollinator habitats by identifying the options for green corridors and new pollinator habitats in an early phase of the design, as well as making provisions for connecting valuable nature areas through butterfly-ways that cross both urban and rural landscapes. A major shift here is to safeguard nature values present and incorporate or save them in the design instead of applying tabula rasa.

The most important actions to be considered in the design phase are listed in this chapter:

Preserve, enhance and create pollinator-friendly habitat.

A good planting palette should always aim for full season color and blooms. While this should provide the minimum pollen and nectar resources for your local pollinators, ideal pollinator habitat should provide significant native floral diversity, optimized for the project site's conditions, having abundant blooms and resources early in spring season. In general, the more biologically diverse a site is, the more species of pollinators it can support.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After feeding on nectar and collecting pollen, bees return to their hives and nests for shelter, to raise their young, and to overwinter. Unlike the large, comb-filled hives of the European honey bee and other social bees, about 70% of native bees are solitary and nest in the ground. The remaining 30% nest in wood cavities and hollow stems. In an undisturbed or unkempt landscape, these spaces and resources are often abundantly available, only to be cleared out to "improve" or develop a site. While some level of disturbance is inevitable, be sure to **recognize existing sources of food and shelter for pollinators on the project site, preserve them, and if necessary, strengthen their natural value to obtain a higher quality.** It is a good practice to involve local authorities, nature organisations and/or experts when securing habitats for wild pollinators.

In addition to preserving the existing habitats of natural value, locations should be identified where new habitats can be created to help pollinator populations. **When creating new habitats, one should consider letting nature regenerate on its own to the benefit of wild pollinators.** The natural process of succession (or self-seeding) is a free service by nature that can increase biodiversity value of habitats. This can be complemented by additional planting of native flowers seed mixes, when needed.

Elements of high-quality pollinator habitats

Pollinators need foraging sites (for food) and nesting habitats (used as shelter during hibernation time or while settling colonies). Most urban spaces provide one or the other, sometimes even both at the same time, which would be ideal. If separate, they can work well if they are well connected to each other, allowing pollinators to easily move between them. Elements that high-quality pollinator habitats should include are:

- Heterogeneous landscapes (a patchwork of fine-leaved grassland, wildflower-rich grassland, heathland and open bare areas);
- Diverse surface and soil conditions (substrate, topography, water availability);
- Ideally, some areas of bare ground to allow for nesting possibilities;
- Vegetation of varying heights to benefit sedentary stages such as cocoons by providing a substrate;
- A diverse plant community with no more than 10% of a single plant species, both flowering and nonflowering (as larval host plants);
- High abundance and diversity of flowering plants, with flowers of different size, colour and shape suitable both for generalists and specialists; many of them growing in clusters;
- A mix of early and late flowering species of plants;
- Use of native species;
- Limited management, ideally remaining as unmanaged as possible;
- Absence of environmental pollutants (including pesticides, heavy metals and light pollution);
- A variety of nesting habitats, including loose soils such as sand and loams, shrubs, herbaceous plants of different heights, dead wood, dried leaves, twigs and stems, stones and logs.

Furthermore, landscape architects, managers and contractors can prevent the spread of invasive alien species (IAS). The most effective and cost efficient way to mitigate the impacts from IAS is to prevent their introduction in the first place and secondary their spread via movement of infected soil (with seeds). The adoption of best practices which restrict the movement of soil from infested areas, is needed. In addition, to reduce the risk of seeds being transported attached to vehicles, machinery, or equipment, it is necessary to inspect and clean all those that have been used within or close to infested areas.

Design and connect green spaces

This section provides some practical advice on how to improve the quality of pollinator habitats through pollinator-friendly design and management.

An important step forward for the landscape sector is to choose to mimic nature in its design instead of traditional landscaping with monoculture lawns and planting of non-native species. Mimicking nature includes the selection of native plants and seeds that have not been treated with systemic pesticides and that create natural native diversity adapted to the local environmental conditions, but also simply **allowing nature to regenerate on its own to the benefit of wild pollinators (limiting management efforts**). Simple changes to management of grasslands will give wildflowers a chance to grow. This is one of the most cost-effective ways to provide food for pollinators and

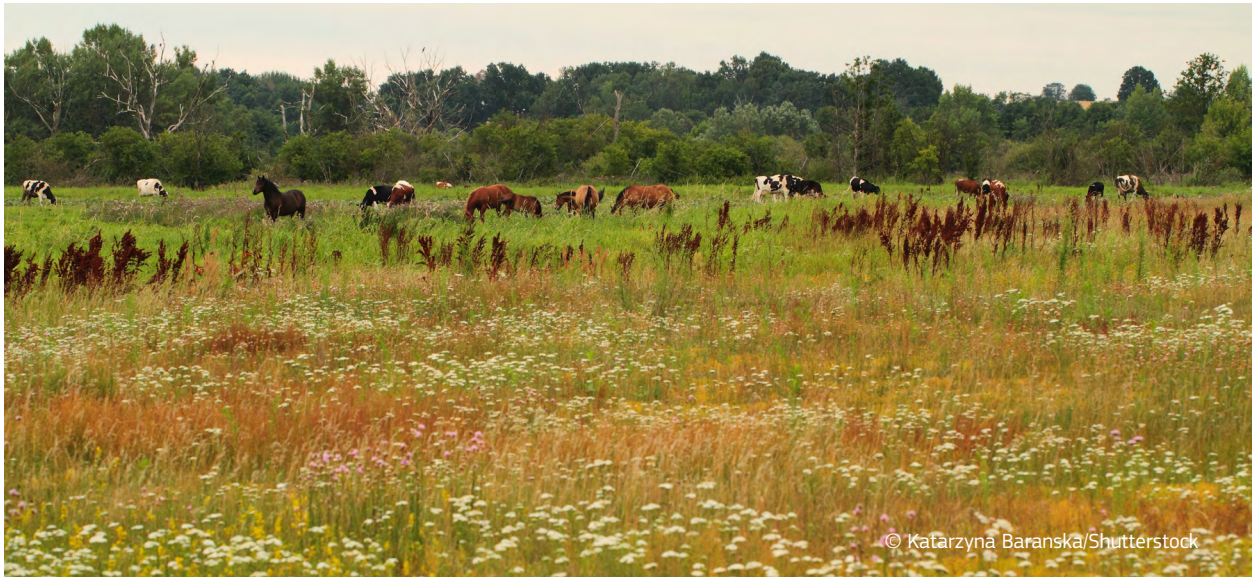
Hycleus lugens © Alchemist from India/Shutterstock

other insects, and will not just benefit pollinators; well-managed grasslands can produce magnificent and colourful displays in summer. It will also help reduce pollution, improve soil structure and reduce flood risk. It is recommended for businesses to partner with local NGOs, authorities and/or recognized experts to integrate biodiversity and ecosystem services thinking in the design process of the project site.

Landscape planners should prioritize the use of native plant species as this will provide valuable food and nesting resources to pollinating insects and support wider biodiversity.

Green corridors with abundant vegetation play an important role in a creating healthy, ecological environment. They provide appealing habitats for fauna and flora and social benefits such as recreation. Several cities and regions have green infrastructure and open space strategies in place that lay the groundwork for pollinator preservation and habitat expansion efforts. **Through anticipatory land use planning, the landscape sector can identify options for green corridors and new pollinator habitats into its project designs, strategically linking existing spots of green infrastructure.** Especially the already existing linear infrastructure, such as waterways, verges, high voltage power lines etc. create interesting opportunities for the development of ecological corridors. By ensuring habitat connectivity this benefits pollinators and allows for the movement and mixing of species.

Also, the sector should consider the **multi-functionality of green infrastructure** (combining different functions to enhance the utility of the planned/developed green infrastructure) for multiple co-benefits and leveraging wider funding for pollinator conservation. For example, by complementing green belts and green corridors when planning



traffic verges, road side and railway verges, roundabouts, water ways and river banks, ecosystem functioning can be improved while also promoting ecosystem services and societal wellbeing and health. Highway verges and associated land can play an important role in providing habitat for pollinating insects, because of both the total area and also how they form linear features providing connectivity in the landscape (pollinator highways). Another important function of green infrastructure to protect biodiversity in the future, is that it connects people with nature in their living and working environment, raising awareness of nature's multiple benefits. While safety concerns will always be paramount, there is significant scope to manage the land in ways which increase habitat diversity and offer greater benefits to pollinators. A good guidance to develop pollinator-friendly transport corridors is developed by the All-Ireland Pollinator Plan [10].

Sustainable drainage components such as green roofs, green (living) walls and rain gardens can be designed and managed to simultaneously provide benefits to pollinators. They do not only provide a more beautiful view but can also serve as important pollinator habitats.

Landscape architects and planners should rely on local nature experts (e.g. nature NGOs) to identify the high potential areas for creating and reconnecting pollinator habitats (such as brownfields[12] and unused areas, green corridors, green roofs, sustainable drainage systems, road, railway and waterway verges) and take them into account when in the design phase.

Companies should also consider creating a link to the community, in order to promote the role of biodiversity in the social life, health and wellbeing of residents and the wider community. The landscape design can nurture contact with nature and provide educational opportunities by inclusion of play spaces and community facilities together with the wildlife areas, so they can provide benefits and not barriers to the use of the site. For example, residents could be invited to help build and monitor a range of habitats such as insect hotels.

In order to ensure pollinator-friendly management, businesses should aim to protect the elements of high-quality pollinator habitats as described in Box 2, for example by banning the use of pesticides and reducing the mowing frequency to create species-rich grasslands. Also, managing different parts of the site differently, can result into greater habitat diversity. More site level actions are described in Chapter 3.4.

Pollinator-friendly management of spaces

In addition to efforts into the planning of pollinator habitat, from early on it also should be considered and planned for how to manage the site after realization of the landscaping project. The full potential of pollinator-friendly management is achieved by good pre-arranged maintenance contracts. Pollinator habitats normally need less management in the long term, with some actions leading to financial savings (i.e. reduced cuttings).

The actors of the landscape sector should, together with the landscape owners, draw up a long-term action plan, parallel with a landscape and ecology management plan, that identifies and protects the areas that are already providing food (e.g. patches of wildflowers, weeds or flowering hedgerows) and shelter (e.g. bare soil, long grass and dry-stone walls) for wild pollinators.

[12] Brownfields are abandoned areas or pieces of land on which previous developments or industrial activities once existed. Often, such sites suffer from soil contamination but some of them also have a high biodiversity value and support various forms of insects.

Businesses should cooperate with biodiversity experts, NGOs or local nature authorities to define the pollinator-friendly management practices in uptaking these actions. Furthermore, they should provide training on the importance of wild pollinators and pollinator-friendly management practices to land maintenance staff, to foster an understanding of the existing and potential wildlife value on site and how to adjust planting to changing climatic conditions. In addition, companies should appoint estate managers with good communication skills and an aptitude for community engagement to explain the value of habitats on site to residents. For example, through a local planting group, interest and involvement of the community can be created.

Evaluate the actions taken

To assess that the actions taken lead to results, it is recommended for businesses to systematically monitoring wild pollinator populations in the area of actions. Monitoring can be a management tool that enables project managers to track activities for the implementation of a value chain development strategy and see whether development targets are achieved. The company could, for example, monitor the occurrence and diversity of local pollinator populations at the project site or its own company's premises either though local partnerships and/or by engaging in local citizen science programmes[13].

While not every project can afford to consult with an ecologist or botanist, there may be opportunities to collaborate with local NGOs, universities, or botanical gardens to gather baseline data during a projects' site analysis phase. Many of these same organizations may also be able to assist during design, construction, and post-occupancy evaluations as well, presenting opportunities for consultation and research.

[13] See also 'Citizens for pollinator conservation: a practical guidance', guidance prepared by the Institute for European Environmental Policy (2020) for the European Commission.

3.3 Value chain actions

The landscape sector can play a big role in guiding its suppliers of planting materials into pollinator-friendly practices and increasing the awareness of the stakeholders (e.g. clients, financers, regulators) that are relevant for the value chain. As such, the sector can set the scene on how project sites are developed and which landscaping practices are rewarded.

Identify business risks and opportunities across the entire value chain

A first step for the company is to get good insight into the stakeholders that are part of the supply chain of its planting materials and soil. It must be acknowledged that it may take some effort for the company to know exactly where its materials are coming from and how natural resources are used at every step of the production process and how its suppliers impact biodiversity. However, in the end, knowing this will reduce several of the risks that were highlighted in Table 1. Taking actions to improve pollinators can be employed as a marketing strategy in which the use of native, pollinator-friendly planting (and building) materials is being a way of differentiating the business from its competitors.

Encourage the entire value chain to act.

In order to make a value chain environmental friendly, it is necessary to consider all activities in the value chain such as design, supply, production, assembly, packaging, logistics, distribution, marketing, after-sales and appropriate product disposal.

Improving the value chain performance with environmental friendly solutions includes the reduction of energy consumption, environmental accidents, air emission, waste etc. Companies should ensure that its products and operations cause the least damage to the environment during the whole product life cycle via green purchasing, green design, internal environmental management, green production, environmentally friendly packaging and transportation. Specifically for the landscape sector, the removal or addition of soil and the prevention of introducing invasive alien species to new ecosystems, has multiple effects on biodiversity and pollinators.

To reinforce efforts like these, companies should monitor suppliers' sustainability performance and hold them accountable for it. Once companies know where their supply-chain issues are, they can set goals for lessening the resulting impact. Ultimately, consumer-based companies can only achieve ambitious sustainability goals if they set high standards for their suppliers' performance and stop doing business with suppliers that fall short.

Subsequently, companies in the landscape sector can audit its suppliers to determine if they are taking appropriate measures for maintaining or restoring wild pollinator populations and assist them with managing their impacts. They can reward its suppliers for good practices (e.g. reducing peat percentage in substrate, selecting native plant species etc.), for example by offering suppliers long-term contracts tied to commitments related to delivering rich biodiversity on their land and providing diverse habitats for pollinators. Long-term contracts thereby enable the suppliers to invest in long-term measures which is crucial to reverse the negative trends of pollinator populations.

More recommendations are included in a separate guidance developed specifically for the horticulture sector[14].

[14] Arcadis Belgium. (2020). Business and nature working together: Action by the building sector to protect wild pollinators.

Identify opportunities for research and collaboration

Investing in pollinator protection initiatives that create pollinator habitat will inspire and motivate people and other businesses to act. It is vital to pollinator protection that landscaping companies, architects and planners continue to build relationships, consult, and engage with stakeholders and work with the latest scientific information to improve habitats.

Landscape architects and planners should collaborate with local NGOs or biodiversity experts to identify the high potential areas for creating and reconnecting pollinator habitats and involve them in the design phase.

Pollinators do not recognise borders. Therefore, working across areas, private land and municipal boundaries will enhance the wider pollinator resource and improve pollinator habitat connectivity and populations throughout the entire landscape. Whilst project developers and local authorities are important in the management of their land for pollinators, NGOs, community groups, business and other organisations are important to help implement the actions and monitor changes in pollinator populations.

3.4 Site/local level actions

While the previous chapter focused on sector-specific actions, this last chapter gives an overview of measures that can be applied to all business sectors, since they target individual business locations (for example, the premises of a business' headquarters or an industrial facility), as well as the company's properties that have not yet been developed for business purposes.

Action within companies' grounds

Businesses can draw up a long-term action plan, alongside a management plan, that identifies and protects the areas on the company's premises that are already providing food (for example, patches of wildflowers, weeds or flowering hedgerows) and shelter (like bare soil, long grass and dry-stone walls) for wild pollinators. In order to ensure pollinator-friendly management, the following actions are key:

- Reduce mowing frequency to create species-rich grasslands. Natural habitats can be further supplemented by artificial ones (for instance, bee hotels).
- When planting for pollinators, use native species (like seed mixes, clovers, bulbs, trees and shrubs). Ensure that wild pollinators have foraging resources during the whole vegetation season.
- Ensure connectivity with surrounding areas of green infrastructure and nature importance by creating grasslands and other types of vegetation that support rich biodiversity.
- Avoid and control the spread of invasive alien species[15], both plants and animals.
- Consider the construction of green roofs and walls[16], as they can provide considerable feeding ground for wild pollinators.
- Reduce light pollution, as artificial light can negatively affect insect populations.
- Adopt a pollinator-friendly management protocol and do not use pesticides (insecticides, fungicides and herbicides), as these can be harmful to wild pollinators.
- Ensure contractors that manage the company's land are aware of the company's intentions to enhance wild pollinators and how this should be realised.


Bee shelter in bare soil © Dominik Linhard/www.bundesforste.at


Reducing mowing frequency© Joe Gough/Shutterstock

It is recommended that businesses partner with local NGOs/authorities or experts to include biodiversity and ecosystem services at the design stage of the company's site. They can also help with development of key performance indicators (KPIs) and, as it was already mentioned, with monitoring, reporting and evaluation of outcomes. The company could, for example, monitor the presence and diversity of local pollinator species at the company's site and the wider environment either through local partnerships or by engaging in local citizen science programmes[17].

These actions within the companies' grounds can benefit wild pollinators and overall biodiversity most when they are applied early in the design stage of the company's site when the landscaping and infrastructure features are still open for creativity. **When securing habitats for wild pollinators, the main guiding principle is to let nature regenerate on its own.** This can be complemented by additional planting of native flowers seed mixes, if/when needed.

[15] See also 'Managing invasive alien species to protect wild pollinators', technical guidance prepared by IUCN (2019) for the European Commission.
[16] See also 'A guide for pollinator-friendly cities: How can spatial planners and land-use managers create favourable urban environments for pollinators?' by Wil et al. (2019), guidance prepared by ICLEI Europe for the European Commission.
[17] See also 'Citizens for pollinator conservation: a practical guidance', guidance prepared by the Institute for European Environmental Policy (2020) for the European Commission.

Generic actions which do not require any land hoding

It is recommended for businesses to embed pollinator-friendly actions into the company's strategy and daily operations:

- Integrate pollinator-sensitive practices into the company's environmental management system and/or other certification schemes or standards.
- Introduce internal biodiversity policy commitments that include measures to improve pollination. For example, by implementing a biodiversity- or pollinator-friendly purchasing policy, the business can direct its suppliers to reduce the negative impacts on pollinators.
- Link the business' strategy to national and international biodiversity policy (including the EU Pollinators Initiative) and to the SDGs[19] (namely SDG 15 "Life on Land", SDG 2 "Zero hunger" and SDG 12 "Responsible consumption and production").

In addition, the company can invest in projects to restore, create and connect pollinator habitats to reduce the environmental footprint of their buildings and operations and obtain general environmental benefits (reduced solid waste and wastewater, less pollution, energy efficiency etc.) and implement green procurement. Overall, these improvements will benefit nature and wild pollinators alike.

Also, the company can take efforts to **raise awareness** of:

- **the local community:** sponsor creation/restoration of pollinator habitats or arrange an expert to give a training/lecture on the conservation of wild pollinators;
- **the business' workplace:**
  - organise pollinator awareness training sessions or workshops for employees (for example, on how to ensure their own gardens are pollinator-friendly, or how to observe and record wild pollinators in order to help monitoring efforts);
  - include environmental considerations at each stage of the procurement process of goods, services and works (i.e. green procurement);
- **the business sector:** share your experiences regarding the implementation of pollinator-friendly measures with the EU Business @ Biodiversity Platform[20] at relevant conferences or seminars, and/or through social media using the #EUPollinators.

Business @ Biodiversity

[19] https://sdgs.un.org/goals
[20] https://ec.europa.eu/environment/biodiversity/business/

4. WHAT ARE FRONT-RUNNERS ALREADY DOING?

This section presents a limited, non-exhaustive set of examples of businesses taking action for pollinators, to illustrate the diversity of potential actions that could be uptaken by the horticulture sector. The list has been generated by consulting the members of the EU Business and Biodiversity Platform[20], and through literature review.


© Cosun Beet

Cosun Beet Company

Company: The originally Dutch company Cosun Beet Company (formerly Suiker Unie) is one of the top five European beet sugar producers.

Action:

In 2018, Cosun Beet Company signed the regional Bijenlandschap West-Brabant covenant in 2018 as a symbol of commitment to contribute to the habitat of bee and other pollinators. Bijenlandschap West-Brabant is an open network where anyone who wants to do something for bees (honey and wild bees) and other pollinators can join. The partners, supported with scientific research by Wageningen Environmental Research, work together on a landscape network for pollinating insects.

Each year, the organisation invests in pollinator-friendly planting, sowing of flowers and management projects on company's premises. Some plots are for example spared for mowing and grazing by sheep. One example is the Cosun innovation centre in Dinteloord (Netherlands), where a few hectares of new pollinator-friendly habitat was created and managed to the benefit of pollinators. Concerning the mowing management, the prevailing motto was: "Long if possible, short if necessary!"

In addition, the company donated 800 bags of flower seed mixture to its employees, among others, to sow flowers in the their gardens. Cosun Beet Company joined the local Bijenlandschap West-Brabant partnership and collaborates with the NGO Naturalis Biodiversity Centre in a Green Circles cooperation together with the Province North-Brabant to promote biodiversity and the bee landscape.

Benefits for the company:

- By working together, the necessary knowledge can be gathered and exchanged and larger projects can be tackled that fit together, with a better result for the bees and other pollinators as a result.
- Engaging in projects alike, ensure a good relationship with direct business stakeholders, such as customers, suppliers and employees.

More info:
https://www.nieuweoogst.nl/nieuws/2018/05/09/suiker-unie-zaait-enkele-hectares-in-met-bloemen
https://www.cosunbeetcompany.nl/nieuws/suiker-unie-zaait-enkele-hectare-in-met-bloemen/16
https://www.groenegewasbescherming-bestuivers.nl/nl/ggb/Show/Vele-partijen-ondertekenen-Convenant-Bijenlandschap-West-Brabant-en-de-Nationale-Bijenstrategie.htm

[21] https://ec.europa.eu/environment/biodiversity/business/index_en.htm

Cathal O'Meara Landscape Architects

Company: Cathal O'Meara Landscape Architects is a young, Irish landscape architecture practice driven by a strong desire to improve the quality of our built environment. The company offers a broad range of design and consultancy services to the environmental, planning and development sectors.

Action:

- Cathal O'Meara Landscape Architects, partnering with local ecologist Peter Cuthbert, redesigned the 16 acre Peace Park (former Smitwicks Brewery site) at Kilkenny City. In close cooperation with the Kilkenny city Council, the company developed the Floral Mile, the largest urban meadow in the country, forming a vibrant, contemporary approach to planting, and year round textural interest whilst keeping on-going maintenance to a minimum.
- Specific plants were selected to attract pollinating insects.
- The National Biodiversity Date Centre of Waterford is recording the pollinating insects present to further understand the connection between specific plants and the associated insects.

More info:
https://cathalomeara.com/portfolio-items/kilkenny-floral-mile/

Highways England - A590

Company: Highways England, formed in April 2015, is a government-owned company charged with operating, maintaining and improving England's motorways and major A motorways.

Action:

Highways England is a partner in the NEWP 32 GTCP Project, a 3-year pilot programme of work led by Natural England. Part of this programme, was a project on the A590 route within the Morecambe Bay Nature Improvement Area. This project aimed to enhance the way that the green infrastructure along road verges can be managed to better integrate into the surrounding landscape, enhance ecological connectivity, provide wider goods and ecosystem services that benefit society and local communities, and improve the resilience of transport infrastructure to climate change. This has involved improving grassland habitat for pollinating insects, provide wood fuel and woodland biodiversity and improve the visual landscape.


© Cosun Beet

In 2015/2016, 73 individual soft estate plots along the A590 were visited and identified for enhancement works. After discussion with local experts and stakeholders, baseline survey methods were developed and implemented in the summer of 2016, which then informed the management regimes for each plot. Botanical and butterfly baseline surveys have been undertaken at some of the sites, using Cumbria Wildlife Trust and Butterfly Conservation Trust Volunteers.

Management works from 2016 to 2020 have included clearance of scrub and non-native and invasive species from grassland sites, hedge planting and laying, wildflower plug planting and seeding, and the collection of arisings from grass cutting, in order to create habitats that provide food, shelter and nesting sites for bees and other pollinators along the grassy edges of the A590 route.

The four year project has successfully enhanced and restored 13.5 ha of roadside vegetation along the A590, providing important connections for adjacent designated sites including Sites of Special Scientific Interest and Special Areas of Conservation.

Benefits for the company:

- Strengthened relationship with partners including Natural England, Cumbria Wildlife Trust, Butterfly Conservation, Buglife etc., leading to improved support and engagement of local communities.
- The programme provided important biodiversity connections with adjacent designated sites including Sites of Special Scientific Interest and Special Areas of Conservation, reducing the environmental impact of the A590 corridor.
- The A590 Morecambe Bay project led the way for developing another biodiversity improvement partnership project led by Cumbria Wildlife Trust called 'Get Cumbria Buzzing', which involves creating flowering lawns, flower rich grassland and other habitats for pollinators along the A66 and A595 roads in north Cumbria.

More info:
https://www.hln.be/in-de-buurt/asse/lente-komt-eraan-gemeente-verdeelt-bloemenzaad~a9569312/
https://www.ecoflora.be/nl-nl/partners/
https://vhm.be/onewebmedia/Presentatie%20bloemenweides%20-%20Bart%20Kersschot

5. FURTHER READING

EU Pollinators Initiative:

- https://ec.europa.eu/environment/nature/conservation/species/pollinators
- https://ec.europa.eu/environment/biodiversity/business/news-and-events/news/news-84_en.htm
- Arcadis Belgium (2020) Business and nature working together: Action by the building sector to protect wild pollinators.
- Arcadis Belgium (2020) Business and nature working together: Action by the tourism sector to protect wild pollinators.
- Arcadis Belgium (2020) Business and nature working together: Action by the horticulture sector to protect wild pollinators.
- Arcadis Belgium (2020) Business and nature working together: Action by the agri-food and beverage sector to protect wild pollinators.
- Arcadis Belgium (2020) Business and nature working together: Action by the forestry sector to protect wild polinators.

IPBES reports:

- https://ipbes.net/global-assessment-report-biodiversity-ecosystem-services
- https://ipbes.net/assessment-reports/pollinators

All-Ireland Pollinator Plan (2019) Pollinator-friendly management of: Transport Corridors. Guidelines 9. National Biodiversity Data Centre Series No. 20, Waterford. Available at: https://pollinators.ie/wp-content/uploads/2019/10/Transport-Corridors_actions-to-help-pollinators-2019-WEB.pdf

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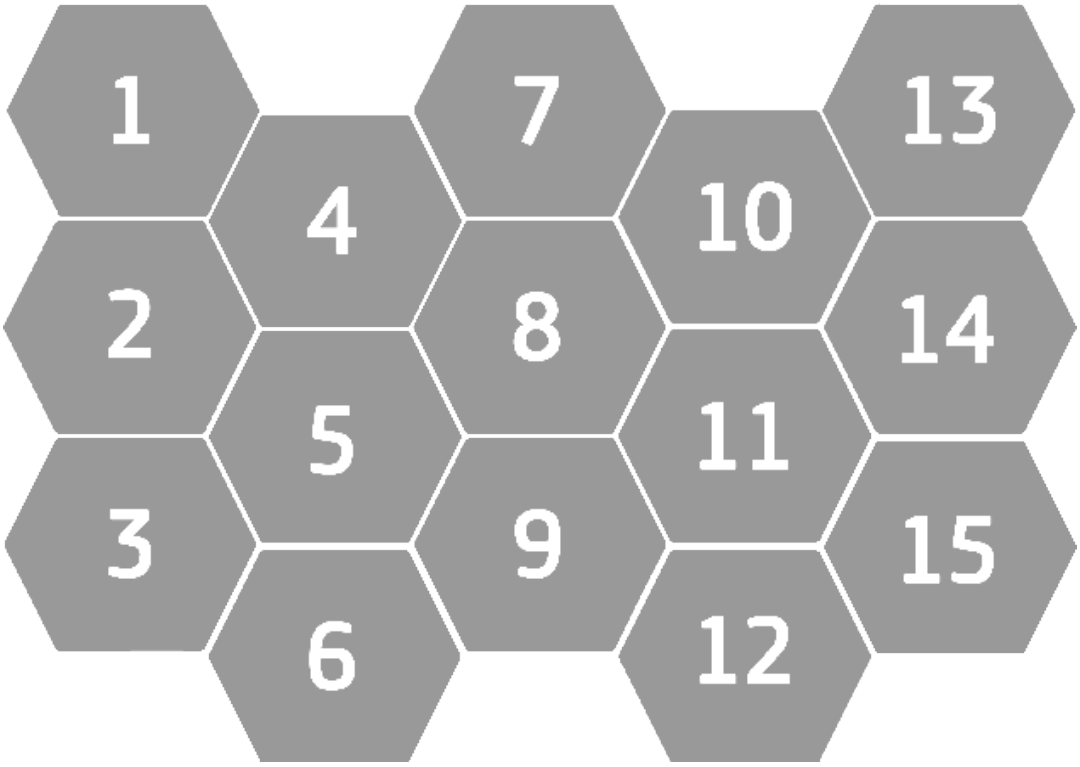
Annex I



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