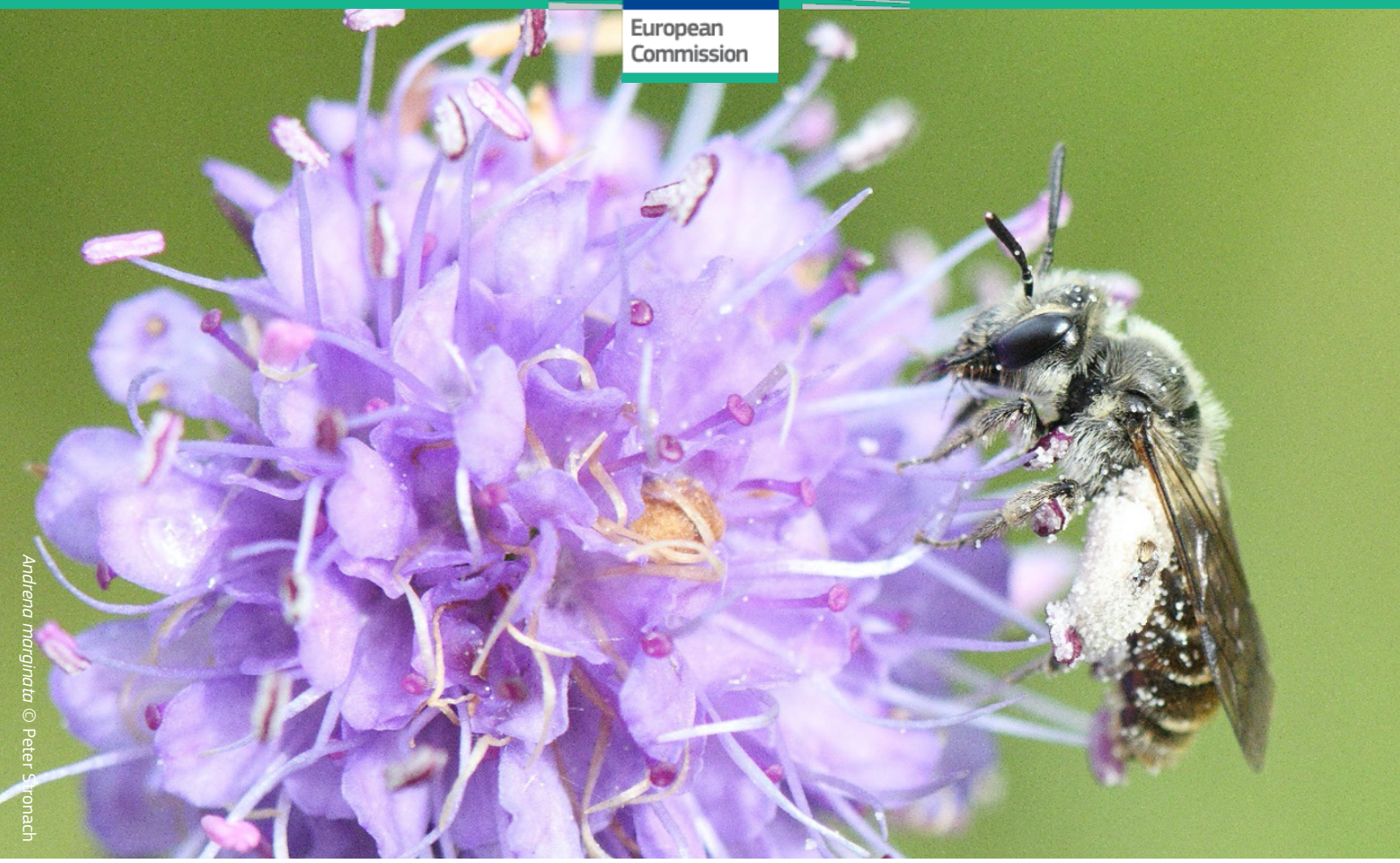


Andrena marginata © Peter Stronach

Business and nature working together:

action by the extractives sector to protect wild pollinators

Environment

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

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

Arcadis Belgium. 2020. Business and nature working together: Action by the extractives sector to protect wild pollinators. Technical guidance prepared by Arcadis for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 "Technical support related to the implementation of the EU Pollinators Initiative".

Authors: Kim Driesen (Arcadis), Hans Van Gossum (Arcadis)
List of contributors: Evelyn Underwood (IEEP), Carolyn Jewell (HeidelbergCement)
Date of completion: October 2020

Manuscript completed in October 2020

Luxembourg: Publications Office of the European Union, 2020

PDF ISBN 978-92-76-22857-8 doi:10.2779/317166 KH-02-20-845-EN-N

Table of content

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

Why is this guidance needed?

This guidance document for businesses is part of the broader implementation of the EU Pollinators Initiative . 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 companies in the extractives sector, extracting all sort of minerals. Its scope includes both site-specific local actions as well as measures across the value chain that can contribute towards the conservation and restoration of wild pollinator populations. The guidance document also informs businesses on 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 and beetles – are declining dramatically around the world, and Europe is no exception. With pollinator populations being 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?

There is growing recognition from a wide range of stakeholders, including regulatory agencies, customers and financial institutions, that biodiversity, including the protection of wild pollinators, needs to be integrated into government, financial and corporate policies and into the operations of companies within the extractives sector.

The risks that extractive activities pose to biodiversity should be carefully managed and taken into account before the extraction process starts. When taking biodiversity and pollinator actions, the sector can benefit from the ecosystem services provided by nature for free in the form of dispersion of seeds and natural revegetation, which are important aims of rehabilitation projects. In addition, these actions could lead to easier access to land and reduce compliance costs.

The extractives sector has plenty of opportunities for ecosystem restoration and the creation of new and temporary habitats over the lifetime of its operations. Restoring pollinator populations to healthy levels will help prevent economic losses, provide other environmental and social benefits and assist the company in building/maintaining a good rapport with the public.

[1] COM(2018) 395 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528213737113&uri=CELEX:52018DC0395

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 extractives sector should:

- decide strategically where to locate the business, thereby avoiding impact on biodiversity-rich areas;
- prevent and mitigate possible negative impacts during extractive activities, while aiming for biodiversity enhancement, following the mitigation hierarchy principles;
- develop an asset strategy in which biodiversity impacts are considered from an early stage, including:
  - a baseline inventory;
  - all activities that may have impacts on wild pollinators and broader biodiversity;
  - defining appropriate goals for pollinator habitat and other biodiversity features, to ensure restoration in line with regional and/or national biodiversity conservation objectives
  - monitoring and evaluating the impacts of actions on wild pollinators.
- create biotopes before, during and after extractive activities e.g. creating species rich grasslands or allowing spontaneous revegetation;
- ensure pollinator habitat and biodiversity in the afterlife of extractive activities;
- partner up with NGOs, local nature authorities and/or academics when drafting and implementing actions for pollinators, and evaluating their impacts;
- raise awareness of the role of pollinators to its stakeholders and encourage them to partake in actions that promote pollinator conservation.

© Het Wijveld in bloei

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

Pollinator populations are essential to underpin the stability of pollination 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 - see Annex 1 for photo credits

[2] 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.

1.1 Wild pollinators and extractive activities

The extractives sector is the industry dedicated to the location and extraction of metal and mineral (e.g. gravel, coal, limestone etc.) reserves around the world. Global reserves of metals and minerals are mined for profit and then used in jewellery-making, industrial applications, building materials and investments.

Mineral raw materials are a basis for providing products that meet the needs of today's society, playing a vital role in the modern economy. However, the extraction of such minerals invariably has an impact on the land[3] where operations takes place [4]. Many mines and quarries require the removal of surface features during the extraction process and take up further land for storage mounds, spoil tips and lagoons, as well as for associated infrastructures, buildings and access roads.

Such activities, at least temporarily, may lead[4] to the loss or deterioration of valuable natural habitats and to a negative impact on pollinators and their habitats. When not adequately managed, extractive operations may have a large negative impact on the overall resilience of surrounding ecosystems, through impacts on biodiversity, land, water, air and climate. Our ecosystems provide vital food, fuel and fresh water to society, including local communities and businesses that are dependent on such services.

Notwithstanding, the part of the extractives sector active in extracting minerals that are used in building materials has shown itself to be a frontrunner regarding attention to biodiversity in both business strategy and daily operations. Several of the largest extraction companies issue biodiversity policy statements as part of their overall corporate social responsibility strategy and some already have biodiversity management plans in place that include pollinators as a focus area (see Chapter 4). Pollinators are a key issue particularly for companies with open cast mines that can be very valuable habitat for threatened solitary bees and other pollinator species. Disturbed, sandy or chalky, warm sites are being dramatically lost in surrounding countryside, and therefore provide unique conservation opportunities.

Andrena dorsata © Frank Vassen/Flickr

[3] This concerns specifically extraction activities on land, chapter 8 explores the issues relating to extraction in the marine environment.

[4] Open-pit mining tends to have a greater impact on biodiversity, as the habitat in the immediate impact of the mine is destroyed or significantly disturbed. While underground mining, heap and in-situ leach mining do not necessarily cause as much surface damage, they can still have major negative effects on biodiversity through water, soil and air quality impacts.

Mining bee © angel217/Shutterstock

Clearly, the extractives sector has **plenty of opportunities for ecosystem restoration and the creation of new habitats over the lifetime of its operations**, and is well placed to act positively and effectively for wild pollinator populations. First, new extraction sites can cause only a limited or temporary impact on biodiversity and the natural environment if managed well. Second, there is a growing number of examples where an extraction site over the course of its life cycle has delivered a positive contribution to biodiversity. This is because more and more quarries, pits and mines have been planned from before excavation to the end of their life with a focus on biodiversity improvement. When the mine site is in an impoverished natural environment, the rehabilitated site has the potential to make a significant positive contribution (biodiversity net gain) by providing new or restored habitats for wildlife and pollinators.

By working together, there is the opportunity to do even more, creating an overall net benefit for biodiversity, which can bring multiple benefits for business, the environment and society (see Chapter 3).

2. WHY DO POLLINATORS MATTER TO YOUR BUSINESS?

Ophiusa tirhaca © David Havel/Shutterstock

Managing a business at any value chain level and the ecosystem services involved implies evaluating risks and opportunities at various levels: operational, regulatory and legislation, marketing and reputation, financial and societal. The sector is well placed to seize the opportunities and act positively and effectively for wild pollinator populations (see Table 1 for an overview).

The goal of the Finnish Rudus Oy mining company for its sites is to have a higher biodiversity value when comparing the afterlife mining situation with the baseline.

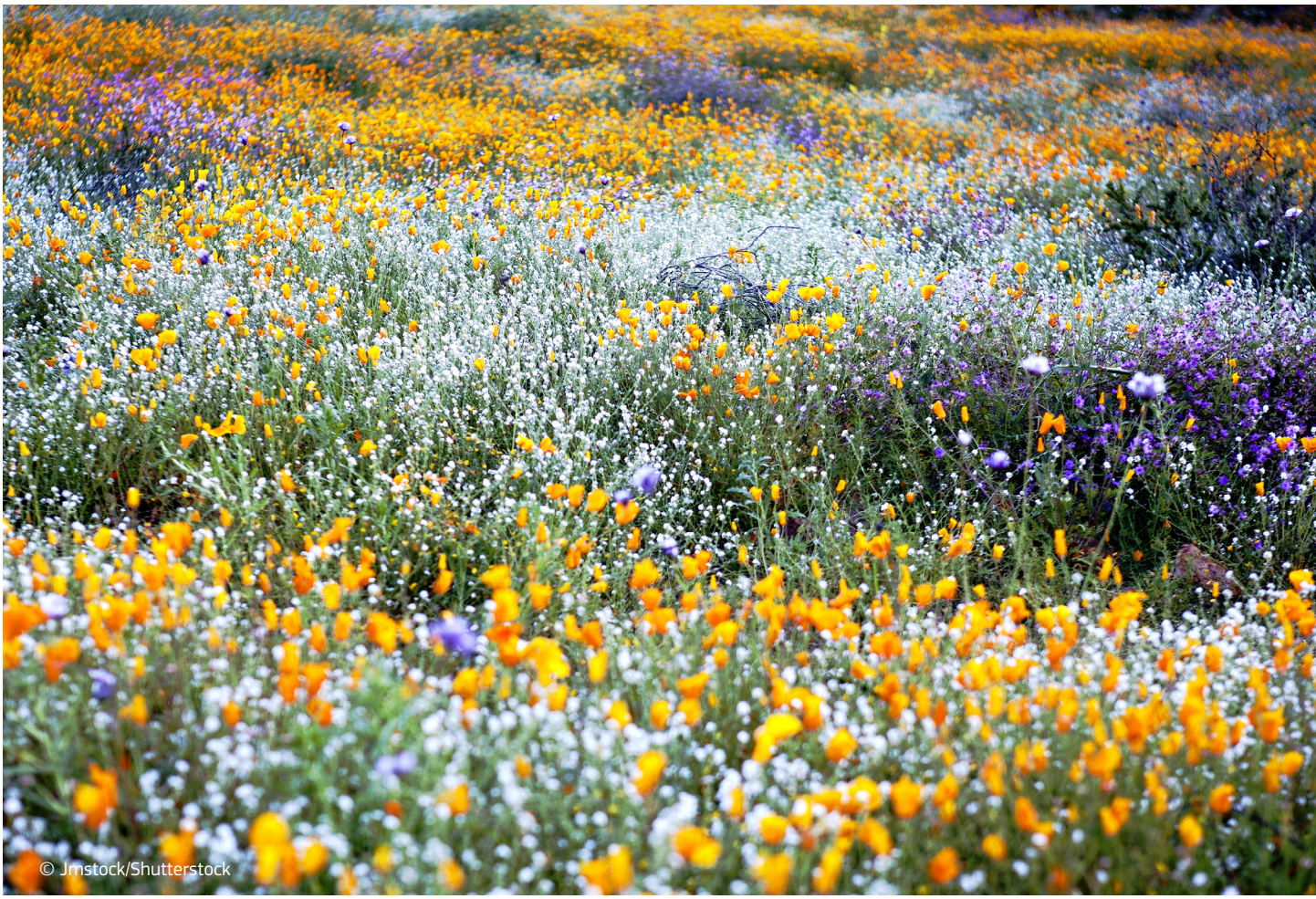
Interested in how they try to achieve this? See Chapter 4.

Quarzwerke organizes excursions to the mine site for children. During the excursion, a visit is made to the bee hotels on the mine site, and the children are shown how the flowers at the site are attractive to bees.

Interested in what your business can do? See Chapter 3.

LafargeHolcim España is carrying out 14 rehabilitation projects in closed quarries. In all of them, actions for the conservation and enhancement of pollinating insects are executed: planting of nutritional plants for butterflies and moths and/or attractive plants for bees, wasps and beetles; installation of pollinator stations for wild bees; habitats for insects (deadwood, nesting aids for hole nesting bees) etc.

Interested in what benefits this has created for the company? See Chapter 3.



© Jmstock/Shutterstock

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

	Risks	**Opportunities**
Operational Regular business activities, expenditures, and processes	▸ **The operational risks and opportunities for the extractives business sector in relation to pollinator decline are limited, and mainly relate to the overall protection of the ecosystem.**	▸ **Improved stakeholder relations, both at the initial stages of project development and for ongoing exploration to extend the lifetime of existing projects. This can result in easier access to land, quicker permit processes, etc.** ▸ **Acceleration of the dispersion of seeds and revegetation, which are important aims of rehabilitation projects for closed quarries.** ▸ **Provision of other ecosystem services and associated benefits (e.g. by linking water and carbon management with pollinator-friendly actions)**
Legal and regulatory Laws, public policies, and regulations that affect business performance	▸ **Costs of introduction of new regulations or license fees, (with requirements for biodiversity monitoring, rehabilitation, control of invasive alien species, etc), to minimize impacts on nature and people and mandate a higher end-of life biodiversity or society quality of the location (net gain) [7].** ▸ **Increased capital costs or production losses due to permit denials or delays.** ▸ Increased fines, penalties, compensation, or legal costs due to conflicts with nature conservation requirements or expectations.	▸ **Reduce compliance costs and/or other costs by:** a. **being more proactive towards (new) environmental legislative frameworks and government policies;** b. **anticipating negative impacts;** c. embedding pollinator risk identification within the supply chain management and certification schemes of companies (e.g. ISO14001).
Financing Costs of and access to capital including debt and equity	▸ Increased financing costs (higher interest rates or harsher conditions), due to increased interest of the finance sector in how businesses in which they invest are dependent on ecosystems services such as pollination. ▸ Loss of financial institutions' interest and investors choosing to stay away.	▸ Gain or maintain investor interest and confidence, which can improve access to finance and/or reduce financing costs. ▸ New "green funds" may become available. ▸ **New environmental markets might emerge (for example, carbon offsets, habitat credits, payments for ecosystem services [8] 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. ▸ **Reduced loyalty of key suppliers or business service providers.** ▸ **Public campaigns, e.g. by negative publicity on unsustainable extracted minerals.**	▸ **Maintain a good relationship with direct business stakeholders, such as the local community, customers and employees.** ▸ **Emerging environmental markets and products may offer new revenue streams (carbon offsets, habitat banking, payments for ecosystem services [8] etc.).** ▸ Differentiating the business to key customers who demand strong sustainability commitments in an increasingly competitive market. ▸ Growing demand for credibly certified products (for example, eco-labels, bee-friendly production labels, etc.), which a bee-friendly production process could qualify for. ▸ Improve physical and mental wellbeing of employees. ▸ Improve ability to attract and retain employees.
Societal Relationships with the wider society	▸ **Local communities may hold the extractives business sector responsible for the decline in pollination.**	▸ 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 improved regulation of water flows.

3. WHAT CAN YOUR BUSINESS DO?

To avoid the risks and be able to seize the opportunities described above (see Chapter 2), it is important for the extractives sector to take measures to improve the status of biodiversity and as part of that wild pollinators.

A first step is to integrate biodiversity into the companies' core business strategies. The sector should capitalize on the opportunities identified while setting and working towards commitments to minimize its impact on biodiversity, including on wild pollinators. This approach will help extractives companies to **make a positive contribution to the protection of biodiversity and ecosystem services, including those that pollinators (and their habitats) provide and that are significant for extractive operations.** This is fundamental for the long-term health of the business and the wider landscape within which it operates.

The most important action that the extractives business sector can take on their land holdings is by deciding strategically where to locate the business, thereby avoiding impact on biodiversity-rich areas. Other important actions are the sustainable management of existing habitat and the restoring of additional habitat for pollinators, for example through planting pollinator-friendly floral resources, providing nesting and overwintering habitat to wild pollinators, or applying a ban on chemicals.

Biodiversity impacts should be considered before, during and after the extraction of materials. The right management (or in some cases not taking certain actions) can restore natural areas and habitats or create new ones. It is therefore highly recommended for the extractives businesses to develop prior to extraction starting a Biodiversity Management Plan, to ensure restoration in line with regional and/or national biodiversity conservation objectives. In such management plan, measures can be put in place to ensure that the contributions are embedded in a practical and coherent way into the operation of each extracting site, and long-term monitoring and evaluation of biodiversity at the mine site is guaranteed.

Extractives companies are recommended to:

- **Commit to the early integration of biodiversity management (i.e. already during the selection of sites) through policy and biodiversity strategies and deliver best practice with time-bound targets;**
- **Undertake a high-level biodiversity risk and opportunity assessment to prioritise focus and identify key company-level risks and opportunities;**
- **Ensure that all site-level Biodiversity Management Planning processes detail actions that avoid, minimise, mitigate, and as a very last option offset potential impacts, in line with the mitigation hierarchy as outlined in the 'EU guidance on integrating ecosystems and their services into decision-making'[5].**

These commitments will help extractives companies to maximise opportunities to make a positive contribution to the protection of wild pollinators, and the associated biodiversity and ecosystem services on land. This is fundamental to the long-term health of the business and relations with the wider society in which it operates.

Chapter 3.1 provides an overview of measures that are relevant for the extracting sites and activities. Chapter 3.2 focuses on actions that can be taken in the context of the value chain. In addition, there might be unused space on the estates where parts of the value chain linked to the extractives industry are located (e.g. processing firms, distribution centres etc.). Chapter 3.3 gives advice on how to develop such spaces to benefit wild pollinators and biodiversity more generally. Such measures not only provide biodiversity benefit, but also improve the physical and mental wellbeing of employees through the creation of an attractive green space. 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).

3.1 Actions on the extraction site

The categories of measures to preserve natural habitats on site and protect natural resources near the sites can be distinguished as follows:

[5] https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

Strategic planning: Safeguarding ecologically-sensitive areas

The risks that extractive activities pose to biodiversity and wild pollinators should be carefully managed and taken into account before the extraction process starts. It is recommended for companies to develop an asset strategy in which biodiversity impacts are considered from an early stage. This strategy can support companies in planning effectively for extractive activities by **safeguarding ecologically-sensitive areas** from direct/indirect and cumulative impacts. The same applies to those companies that manage operations to reduce the direct, induced and cumulative impacts and deliver benefits to biodiversity and society. [8]

Moreover, post-extraction restoration activities should be planned so that they are in line and contribute to biodiversity conservation objectives. Open quarries may provide a suitable habitat for various pollinators, such as warmth loving beetles and ground nesting bees. These new habitats can be also an important **stepping stone habitat or ecological corridor connecting core protected areas**, thereby improving the overall coherence of existing protected area networks, such as Natura 2000. [4]

It is good practice to **involve local biodiversity experts (i.e. biologists, species experts etc.), the local community and/or nature conservation organisations** during the whole project cycle, starting from the selection of sites.

Preventing and mitigating possible negative impacts during extractive activities, while aiming for biodiversity enhancement.

An important early step is to identify the extractive activities that may have impacts on pollinators before the extractives process starts. This requires a through understanding of the ecosystem and the habitats and species near to and at the planned mine site, in order to determine the most suitable objectives with respect to biodiversity. For example, there may be particularly endangered species near the site, which could be harmed by the extractive activities, or alternatively, could benefit . This should be done as part of a thorough site specific risk assessment. The assessment needs to meet EIA or ESIA standards, but going beyond the mandatory requirements by engaging professional species expert surveyors will reap benefits later. The mitigation hierarchy[6] needs to be followed. The **highest priority is to avoid significant negative biodiversity impacts by protecting existing habitats and species when planning the site**. If there are unavoidable impacts, the necessary mitigating and compensating measures should be defined before any work takes place. Extracting companies should include stakeholder consultation or participation, including nature conservation experts, NGOs and local communities, to use all knowledge and perspectives to developing a suitable approach for pollinators and biodiversity more broadly.

Lasioglossum sp. - Most species make their nests in the ground
© Frank Vassen Flickr

[6] SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making. Available at: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF.

It is also very important to carefully plan for monitoring of species and habitats during and after actions are taken, using indicators appropriate to the restoration objectives. A tool for planning monitoring is the Biodiversity Indicator & Reporting System (BIRS), developed for the cement and aggregates sector by the International Union for the Conservation of Nature (IUCN) [10]. BIRS is a simple valuation tool that allows employees responsible for extractive operations to determine the level of risks and opportunities for biodiversity in a given quarry, as well to monitor its evolution year after year. This tool incudes the presence of wild pollinators as a key indicator of habitat quality. See also the example of LafargeHolcim Spain in Chapter 4.

Restoration: improving pollinator habitat and biodiversity in the afterlife of extractive activities.

Open mining sites can be important sites for the conservation of endangered pollinator species, bees, butterflies and hoverflies. Biodiversity and pollinator habitat can be strongly improved when extractive activities are finished (more examples on how extractives businesses are involved in habitat improvement can be found in Chapter 4):

- **Sand mines have much to offer to wild bee species, as vegetation free patches of open sandy soils and embankments offer good nesting possibilities for ground nesting bees. Floral resources can be increased by ensuring that small areas of scrub and grassy vegetation are retained in parts of the site, so that the habitat will rapidly revegetate. Sand mines can offer promising opportunities for wild bee conservation, offering disturbed, open, warm habitats that are disappearing in agricultural and urban areas [11].**
- **The presence of a pond with shallow wet edges is beneficial for several species of bees which need moist soil to build their nest or come here to drink, and to offer habitat for hoverflies.**
- **Limestone and chalk quarries can provide essential habitat for many invertebrates. These habitats support nesting solitary bees and wasps, including the Yellow-legged mining bee (Andrena flavipes) and Potter flower bee[7].**

To seize these opportunities, it is important for extractives companies to draw up a management plan for its quarries, which includes an evaluation of possible habitat improvements for pollinators. To this end, the management plan may describe the desired succession state of habitat patches, which vegetation meets the requirements of the bee species present, and which invasive or problematic species (pest species) will have to be removed. **Natural revegetation should be the main approach** for this, depending on there being sources remaining in the quarry or nearby. If the site was already rocky or sandy, it is important to keep these 'refuge' areas of natural vegetation. If the site was completely non-natural habitat (for example, intensive grassland), then efforts should be made to introduce species that are typical of such habitats and of local genetic provenance.

To contribute to improving the status of wild pollinators, the extractives sector should partner with local NGOs, biodiversity experts (i.e. biologists), nature conservation authorities and organisations and/or academics. With their help, the company can incorporate ways to preserve biodiversity and reduce ecosystem threats across its operations, and perhaps even contribute to saving populations of endangered species. It is considered a best practice to involve these expert stakeholders in the drawing up of the Biodiversity Management Plan before any work begins, with the aim of making the company's site as pollinator friendly as possible during and after extractive activities. Examples of industries that have worked towards a biodiversity net gain with the help of local NGOs are shown in Chapter 4.

As a very last resort, companies should offset potential residual impacts, in line with the mitigation hierarchy principles as outlined in the 'EU guidance on integrating ecosystems and their services into decision-making'[8]. The combination of pollinator-friendly measures with general biodiversity measures might also be a subject for new emerging environmental markets, such as carbon offsets or habitat banking systems[9].

Increase overall awareness and knowledge

The extractives sector could also benefit from developing fruitful partnerships with people living near extraction sites. Operators should **encourage dialogue to foster a mutual understanding of the communities' expectations**

[7] https://cdn.buglife.org.uk/2019/08/HM-Chalk-downland-mosaic-proof-FINAL.pdf
[8] SWD(2019) 305 final Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making. Available at: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF
[9] https://cdn.buglife.org.uk/2019/08/HM-Chalk-downland-mosaic-proof-FINAL.pdf

and of the environmental, social and economic benefits that mining and quarrying projects can bring to local communities. An example of a general awareness raising action by Quarzwerke Gruppe is shown in Chapter 4.
Another possible area is to support innovation and environmental performance in the extractives sector, through the funding of sector-specific and applied research. The extractives business sector can (co-)develop research to decrease the environmental impacts of the extractive activities and to improve the knowledge on e.g. local plant species to protect in order to ensure a healthy pollinator population on the extraction site. This will advance the restoration of the site when the extractive activities are over.

3.2 Value chain actions

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

Improving the value chain performance with natural environmental solutions includes the reduction of energy consumption, environmental accidents, air emission, waste, etc. Companies should ensure that their 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. Reverse logistics activities such as reuse, remanufacture and recycling at the end of product's life cycle contribute to the sustainability of products [12].

The extractives business sector can play a role in encouraging its products' buyers, such as construction firms and distributors, to take positive actions[10] for wild pollinators. Disclosure on biodiversity issues like the pollinator deficit is a critical step in advancing corporate accountability and will help businesses clarify and deepen their commitments to biodiversity and take the actions that are so urgently needed.

3.3 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 management 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[11], both plants and animals.
- Consider the construction of green roofs and walls[12], 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.


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[13].

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.

Generic actions which do not require any land holding

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.

[10] Encompassing conservation and restoration of pollinator species and their living environments (habitat)
[11] See also 'Managing invasive alien species to protect wild pollinators', technical guidance prepared by IUCN (2019) for the European Commission.
[12] 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.
[13] See also IEEP 2020. 'Citizens for pollinator conservation: a practical guidance'. Guidance prepared by the Institute for European Environmental Policy for the European Commission.

- 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[14] (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[15] at relevant conferences or seminars, and/or through social media using the #EUPollinators.

Business @
Biodiversity

[14] https://sdgs.un.org/goals
[15] 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 extractives sector. The list has been generated by consulting the members of the EU Business and Biodiversity Platform[16], and through literature review.

Lafargeholcim Spain

Company: LafargeHolcim Ltd is a Swiss multinational company that manufactures building materials. LafargeHolcim operates four businesses segments: Cement, Aggregates and Ready-Mix Concrete as well as Solutions & Products, which includes precast concrete, asphalt, mortar and building solutions.

Action:

- In 2012/2013, LafargeHolcim Spain started the «Bees and Birds» project for the Yepes Ciruelos quarry. This applied research project is part of Lafarge's agreements with WWF International for the promotion of Biodiversity in the quarry restoration processes. It has been carried out in collaboration with the conservation company Plegadis and the University of Castilla-La Mancha (UCLM).
- The project promotes biodiversity through birds (seed eaters) and pollinating insects, resulting from the planting of native plant species and the promotion of pollinators and the targeted seeding of plants.
- LafargeHolcim Spain is carrying on 14 rehabilitation projects of closed quarries. In all of them, actions for the conservation and enhancement of pollinating insects are executed: planting of flowering plants attractive to butterflies and moths and/or attractive plants for bees, wasps and beetles; installation of bee hotels for wild bees for educational purpose; habitats for insects (deadwood, hotels) etc.
- Jointly working with the environmental authorities and research institutions, the company identified which plant species are threatened in a certain area and are food sources to butterflies. Once identified, these species were then integrated in the Land Rehabilitation Plan and planted during the restoration works.
- The company uses tools such as the BIRS (Biodiversity Indicator & Reporting System), a simple valuation tool that allows employees responsible for extractive operations to determine the level of risks and opportunities for biodiversity in a given quarry, as well as monitor its evolution year after year. The BIRS tool is implemented through questionnaires to be used by the operation workers, that include the importance of diversity and abundance of invertebrates (i.e. dragonflies, butterflies and moths, bees etc.). This makes it possible to evaluate whether the bee-friendly actions lead to an increase in the biodiversity value of a habitat/site.

Benefits for LafargeHolcim:

- It contributes highly to the ambition of LafargeHolcim to demonstrate that the company can contribute positively to the society.
- Pollinating insects are highly valued animals socially, so the actions promoted by private companies for the support and empowerment of their populations are highly appreciated by the administrations, agricultural entities and local NGOs, and therefore contribute positively to the business's reputation.
- Promoting pollinators helps and accelerate the dispersion of seeds and revegetation, which is one of the company's principal aims of the rehabilitation projects.

More info:
Email correspondence with LafargeHolcim Spain
https://cembureau.eu/media/1871/spain-lafargeholcim-cherry-pollinators-final.pdf
http://www.conama2014.conama.org/web/generico.php?idpaginas=&lang=es&menu=293&id=889&op=view
http://www.conama2016.org/web/generico.php?idpaginas=&lang=es&menu=257&id=1353&op=view

City trail Dr Beynon's Bug Farr

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

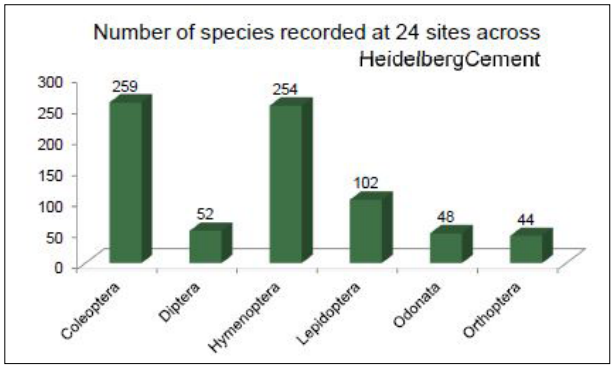
HeidelbergCement

Company: HeidelbergCement is a one of the largest manufacturer of building materials, working in over 3,000 locations across 60 countries.

Action:
HeidelbergCement's extraction business has a large focus on biodiversity, as they are aware that quarries create a wide variety of important habitats for different species. HeidelbergCement has incorporated pollinators as one of its focus topics as a way of contributing to halting their decline.

The company conducted several projects in its quarries over a number of years, showing that its mining sites provide the exact conditions required by many pollinator species to thrive:

- The company organised surveys at a sample of 24 sites, resulting in recording of 254 hymenoptera and 103 lepidoptera species.
- A guidance has been developed and shared with employees to help them understand why pollinators need conserving, how the mining sites can be enhanced for pollinators (quarries as well as plant, office and concrete production sites, but also what individuals can do in their own homes). Furthermore a specific intranet channel has been developed as a knowledge sharing platform for pollinator themed info – both internally produced, and from external sources.
- Every third year HeidelbergCement organizes the Quarry Life Award (QLA), which is a competition to increase the awareness of biodiversity in quarries and to engage the community with their business. They welcome schools, universities and NGO's to participate with projects and then the best projects are selected both nationally and internationally. Many pollinator projects have been developed through the Quarry Life Award. For example, one winning project provided a study comparing the diversity of bees from a reclaimed site, an active site, and the rural landscape. The results showed that HeidelbergCement's quarries supported the highest diversity, which has been a key driver behind subsequent pollinator initiatives across the company.
- In the quarry Górażdże in Poland, where there has been a long standing partnership with an environmental NGO for several years, a new project was implemented in 2019 which focused entirely on the protection of wild bees and pollinating insects. Throughout the year several successful activities have been implemented, one of them was an Ecological Picnic to engage the local community. During the event 150 people from the local community participated.



Number of species recorded at 24 sites across HeidelbergCement - Source: HeidelbergCement

QLA project in the Slite quarry in Sweden from 2018
Source: HeidelbergCement



The Ecological Picnic in the quarry Górażdże in Poland from 2019 - Source: HeidelbergCement

Benefits for HeidelbergCement:

- Increased knowledge about biodiversity within the company, reducing business' risks.
- Secured reputation as a responsible company, showing the nearby community that the company strives to keep its impact as low as possible, or even contributing to biodiversity.
- Securing their reputation also reflects on business' stakeholders and investors.
- The topic of pollinators has been a great tool for its site staff to engage with local communities, for example by school children building insect houses or developing wildflower meadows in and around the mining sites.

More info:
Email correspondence with HeidelbergCement

Quarzwerke Gruppe

Company: Quarzwerke is a German independent family business with over 135 years of experience in extraction, processing and refining of industrial minerals (quartz, kaolin, feldspar). Its extracted raw materials are used in the paper, glass, plastic, foundry, ceramics and rubber industry as well as in the production of paints, coatings and chemical products.

Action:

- Quarzwerke created numerous insect hotels and deadwood heaps to support wild bee populations on its quarries.
- Quarzwerke launched an environmental education project in which children can explore the local nature under expert guidance. In cooperation with Nature researchers (NaSa researchers), the community is being introduced to the topics of nature and species protection and quartz sand mining in a playful way since 2014.
- The company also organizes excursions on the mine site for children. During the excursion, a visit is made to the wild bee hotels on the mine site, and explanation is given on the way the flowers at the site are attractive to bees.
- Quarzwerke works' campaign for the 10th Frechen environmental days had the motto 'insect protection'. Quarzwerke, in cooperation with a local beekeeper, organized workshops for citizens to construct wild bee hotels to put in their garden or on their balcony.

Benefits for Quarzwerke Gruppe:
Quarzwerke's actions were awarded with the German Sustainability Award for several times (2010, 2012, 2016, 2018 etc.). The project "NaSa explorers" was honoured in 2019 with an international prize (United Nations Decade on Biodiversity).

More info:
Email correspondence with Quarzwerke, Germany
https://blog.quarzwerke.de/bienenhotel/
https://blog.quarzwerke.de/du-ich-wir/
https://www.ima-europe.eu/sites/ima-europe.eu/files/publications/Biodiversity_Case_Studies_Quarzwerke_Caminau_Habitat_Network.pdf

Rudus, Finland

Company: Rudus Oy is a Finnish company manufacturing stone-based building materials. It is part of the international CRH Group.

Action:
As part of Rudus' environmental strategy, the company decided to integrate biodiversity protection into its operations. In 2012, Rudus developed a voluntary programme called LUMO for the conversation and promotion of biodiversity before, during and after extraction. Together with nature conservation organisations, the programme aims at training the personnel and the management of the company, to create better living conditions for hundreds of bird species, butterflies, frogs, plants and insects including bees.

The goal for its sites is to have a higher biodiversity value when comparing the afterlife mining situation with the baseline. To achieve this goal, the company started with staff training and site surveys throughout Finland in 2012-2013 and started pilot projects. Since then, they have begun to implement projects with comprehensive LUMO plans, for example for Ryttylä Gorge Nature Reserve. For these sites, the afterlife of the area is designed considering landscapes, natural values, groundwater protection and land use plans.

The Ryttylä area is home to numerous endangered insects and plant species. Among the endangered insect species, the area has found Cydia succedana, Nomada fulvicornis, Meloe proscarabaeus, Tinagma perdicella, Zygaena filipendulae and Andrena nigrospina. Mechanical control of alien pest species has been tested in the area. The future goal is to keep the area sufficiently open. These areas are important for bees and wasps (Hymenoptera) species, including many wild pollinators. In addition, efforts are being made to increase the amount of dead wood in the area in order to further enrich the insect species. The area is being monitored for changes in vegetation, Aculeata-species and butterfly populations.

In August 2017, the Ryttylä area of 32 ha was transferred to the Vuokko Nature Conservation Foundation at a nominal price of one euro.

More info:
https://www.rudus.fi/ajankohtaista/2017/06/20/myrkkypistiaisen-loytaminen-on-ilo
https://www.rudus.fi/vastuullisuus/lumo-ohjelma/ryttyla

5. FURTHER READING

EU Pollinator Information Hive:

- https://ec.europa.eu/environment/nature/conservation/species/pollinators/index_en.htm
- https://ec.europa.eu/environment/biodiversity/business/news-and-events/news/news-84_en.htm

IPBES reports:

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

Bumblebee Conservation Trust - Pollinator advisory sheets. Available at: https://www.bumblebeeconservation.org/wp-content/uploads/2018/03/6192_defra_info_sheet_industrial_final.pdf

Davies, A.M. (2006) Nature After Minerals – How mineral site restoration can benefit people and wildlife: the report. https://www.rspb.org.uk/globalassets/downloads/documents/positions/planning/nature-after-minerals-report.pdf

IEEP 2020. Citizens for pollinator conservation: a practical guidance. Guidance prepared by the Institute for European Environmental Policy for the European Commission.

IUCN. 2019. Managing invasive alien species to protect wild pollinators. Technical guidance prepared for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 "Technical support related to the implementation of the EU Pollinators Initiative".

Potts, S. G., Imperatriz-Fonseca, V., Ngo, H. T., Aizen, M. A., Biesmeijer, J. C., Breeze, T. D. et al. (2016). Safeguarding pollinators and their values to human well-being. Nature, 540(7632), 220–229. https://doi.org/10.1038/nature20588

SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making.

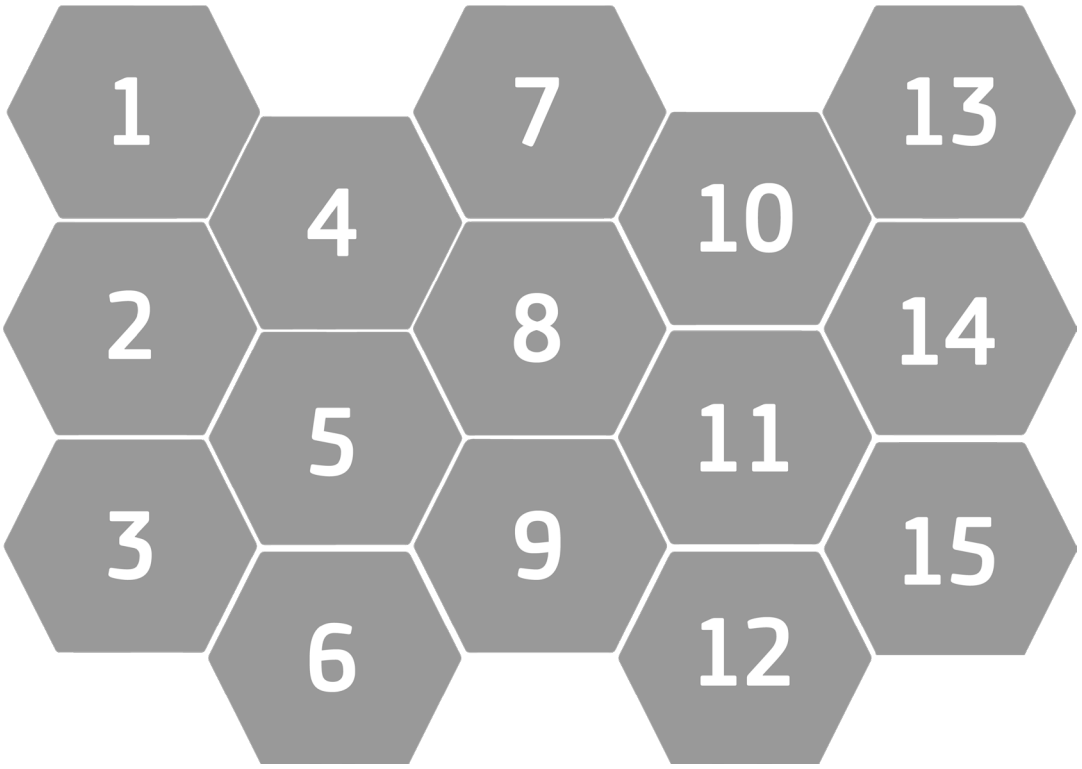
Whitehouse, A.T. (2008) Managing Aggregates Sites for Invertebrates: a best practice guide. Buglife - The Invertebrate Conservation Trust, Peterborough. Available at: https://cdn.buglife.org.uk/2019/08/Managing-Aggregates-Sites-for-Invertebrates_1.pdf

Wilk, B., Rebollo, V., Hanania, S. 2019. A guide for pollinator-friendly cities: How can spatial planners and land-use managers create favourable urban environments for pollinators? Guidance prepared by ICLEI Europe for the European Commission.

References

1. Goulson, D., et al., *Bee declines driven by combined stress from parasites, pesticides, and lack of flowers*. Science, 2015. 347(6229).
2. Hallmann, C.A., et al., *More than 75 percent decline over 27 years in total flying insect biomass in protected areas*. PLOS ONE, 2017. 12(10): p. e0185809.
3. UNEP-WCMC, *The pollination deficit: towards supply chain resilience in the face of pollinator decline*. 2018, University of Cambridge Institute for Sustainability Leadership, Fauna & Flora International, University of East Anglia, & UNEP-WCMC: Cambridge, UK. p. 42.
4. Environment, E.C.D.-G.f., *EC guidance on undertaking non-enrgy extractive activities in accordance with Natura 2000 requirements*. 2012.
5. Makower, J., *State of Green Business*. 2013, GreenBiz.com. p. GreenBiz.com.
6. Fernandez-Stark, K. and P. Bamber, *Inclusion of Small and Medium Producers in the Value Chain: Assessment of Five High-Value Agricultural Inclusive Business Projects in Latin America*. 2012.
7. OECD and Green, *Mining in Green Growth in the EECCA region*. 2019.
8. Viszlai, I., J. Barredo, and J. San-Miguel-Ayanz, P*ayments for Forest Ecosystem Services - SWOT Analysis and Possibilities for Impleementation*. 2016.
9. Gardner, J. and A. Parsons, *ICMM'S GOOD PRACTICE GUIDANCE ON MINING AND BIODIVERSITY 1*. Journal American Society of Mining and Reclamation, 2006. 2006.
10. IUCN, *Biodiversity management in the cement and aggregates sector - Biodiversity Indicator and Reporting System (BIRS)*. 2014, IUCN: Gland, Switzerland. p. 72.
11. Seitz, N., D. vanEngelsdorp, and S.D. Leonhardt, *Conserving bees in destroyed landscapes: The potentials of reclaimed sand mines*. Global Ecology and Conservation, 2019. 19: p. e00642.
12. Sezen, B. and S. Çankaya, *Green supply chain management theory and practices*. 2016. p. 92-114.

Annex I

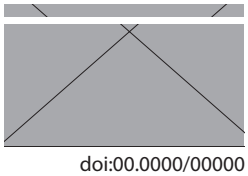


Credits

1. *Anthidium florentinum* © Alvesgaspar (wikimedia commons)
2. *Megachile centuncularis © Line Sabroe (wikimedia commons)*
3. *Anthophora sp* © Alvesgaspar (wikimedia commons)
4. *Eristalis jugorum © Frank Vassen*
5. *Lasioglossum sp. © Frank Vassen*
6. *Bombyliidae sp* © Frank Vassen
7. *Bombus monticola* © Peter Stronach
8. *Zygaena sp. © Frank Vassen*
9. *Xylocopa violacea © Andrea Eichler (wikimedia commons)*
10. *Bibio marci © James Lindsey (wikimedia commons)*
11. *Vespula vulgaris © David Whidborne-Shutterstock.com*
12. *Coccinella septempunctata* © Ivar Leidus (wikimedia commons)
13. *Lycaena hippothoe* © Frank Vassen
14. *Osmia bicornis* © Dawn Nicoll
15. *Andrena marginata* © Peter Stronach

XX-00-00-000-EN-C

Publications Office



doi:00.0000/00000