The wild garden

State of the art, guide to knowledge and realization

The Wild Garden
for Learning and Development

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WILD! The Wild Garden for Learning and Development

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Introduction

"The Wild Garden" is a publication composed of two sections: in the first one, are given the indications that guide the teacher (and not only) to the knowledge and realization of the wild garden, in the second one, the state of knowledge of the experiences previously carried out. This publication is therefore supposed to be an in-depth study for teachers, but also a current and future reference text for those who want to engage in the realization of a wild garden.

The "Wild Garden" is a publishing that wants to guide you to transform your garden into a real Wild Garden! Maybe you're wondering why a Wild Garden?

First of all, it is important for you to know that the quality of habitats for wild flora and fauna has been deteriorating for some time now, due to many reasons, all linked to human action including, for example, intensive management of such habitats. In several European countries, mostly United Kingdom, the practice of gardening has been and is being directed towards the creation of gardens highly rich in biodiversity. Here the native plant species are placed, many other plants are let grown spontaneously and due to such characteristics, provide food and shelter to different species of wild animals. Taking care of the garden's wildlife is one of the best ways to help nature thrive with its own efforts. Any garden, even small, private or public, of your home, of the company where you work or of your school, both in the countryside and in the city, can be turned into a "small nature reserve".

It is also important to remember that children and young people, live today less and less in contact with nature, spending very little time outdoors. Many studies, on the other hand, have been saying and affirming for several years now, how children and young people take great benefit from those experiences that involve them first-hand, closely with nature. In addition, these studies focus on how school activities, related to the study of nature and performed directly outdoors, bring many benefits in learning by students. This is why a lot of realities all over the world promote the practice of wild garden even at school. In this way the students are both involved in the realization of their science classrooms (and not only) outdoors and in the maintenance of the biodiversity of the place where they live.

The handbook you are about to read, seeks to combine the protection of biodiversity in the urban environment with the opportunity that schools can contribute to this important target by realizing proper outdoor classrooms in their garden, to promote the learning of science by observing closely natural phenomena. In the first part, the book will provide basic information on the realization of a Wild Garden, explaining what are the essential elements to transform the available natural space, small or large, at your home or in the yard of your school, in a casket of biodiversity.

The second section illustrates some European and World subjects, associations, fede-

rations and companies, involved in the implementation and promotion of projects of Wild Gardens, also at school level. These projects are briefly described and it is specified, through the link to the websites, how to obtain more information on the activities carried out.

The goal of "The Wild Garden", is therefore to guide the reader towards the awareness of how the realization of a wild garden represents the chance for schools to set up in their outside spaces a real outdoor classroom to support science learning. But it's also an important tool for promoting community involvement and at the same time for working together to improve biodiversity protection.

Creation and management of habitats wildlife gardens

1.1

1.1.1

"What is a Wild Garden?"

Ever more people have recently talked about "*wild garden*". But what is the wild garden really? Let's try to understand better its meaning!

It's not simple to give a specific definition of "*wild garden*", however, we try, starting from trying to understand the meaning of this compound word coming from English

The term Wild Garden comes indeed from two English combined words: *wild* (savage, uncivilized) and *garden* (meadow, ground). In practice, it's a "natural wild garden", opposed to the "farmed garden" and sluggish "English lawn", so common in our current society, but not at all natural, and above all, that does not make any contribution to the increase or maintenance of biodiversity.

In a few words, we could define the wild garden as a space created and managed by man, where an essential aspect clearly differentiates it from the classic "artificial garden". In this space we try to recreate environments suitable for many living organisms, both vegetables and animals: native plants (local), insects, amphibians, reptiles, birds, mammals, etc. In other words, a scrap of biodiversity that will allow to provide shelter to a huge sample of our small fauna that can also live in an urban environment.

If we take a break to reflect and observe, we'll notice that the gardens represent indeed the main natural environment existing in our cities. Even a little patch of land can host a specific biodiversity: there will be several species of plants (mainly herbaceous) and animals (mostly insects) that can be identified even in a small garden of a few square meters. It is also true, however, that we can do so much to make our garden even more wildlife-friendly. This is the main intent of this issue. Well, with the "wild garden" project we want to guide you to the realization of a small or large space where to spend a few minutes or entire days to watch the wonders that nature reserve us just outside the door. Trust us: if you have even a little perseverance, the satisfactions will not be long in coming!

Why a wild garden at school?

1.1.2

A flowerbed, a balcony, the lawn of the house: any space can be assigned to the realization of a wild garden. At this point you're probably asking: "With all the spaces that occur, why a project for the school? Is that really necessary? Couldn't we choose some other place?". The answer to your question is very simple: the reason for this choice is that outdoor school spaces are often underestimated and are almost never seen as real "open air classrooms" where you can observe, study and experiment even in a small piece of land. Being able to be live spectators of the life cycle of a butterfly and studying the creation of a nest or the metamorphosis of a tadpole, represent some unique opportunities of learning to observe with one's own eyes what studied in the books. This is even more true if the children themselves are called to create and manage these outdoor classrooms, to recover their own spaces and to become players of their own learning.

"I hear and I forget. I see and I remember. I do and I understand" (Confucius)

Planning the Wild Garden

1.1.3

Are you ready? Here we go!

Like all the new things we've never done, the first time it can seem really difficult, but it's normal: trust and never be daunted! It's very important a good start...

Before we proceed, here's a tip: first of all, it's always good to start with the choice of the space dedicated to your wild garden. To reconstruct a small corner of nature in the city you do not need large surfaces, even if in the planning step you will of course have to consider the available space, in order to define the elements that you want to include in your *wild garden*.

If possible, the space should allow to realize a series of elements (flowerbeds, hedges, ponds, etc...) so as to recreate a larger differentiation of the garden in environments able to give shelter to as many animal species as possible. Furthermore, keep in mind that it may be useful to plan an area saved for children's activities so that they can work easily and quietly; a space where, if necessary, you can place outdoor desks so that your garden may become a real classroom!

For this reason, we suggest you to find an area of the school yard that is possibly not busy and that can be easily secured with fences to protect both the garden and the pupils. Also select, if available, an area that is not always in the shade, but is instead exposed to the sun for some hours of the day; it would be very helpful that the area had easy access to a spring of water and that maybe it was next to a classroom (potentially to be used as a science lab!) from which you can observe in silence and without any noise the friends of our garden.

The participation of pupils and all teachers (including classes not directly involved in the implementation) is very important. The *wild garden* will become a shared space where you can observe, experience and study. It is therefore important for everyone to take part in its implementation or at least to express their opinion on it, so as to raise excitement around the project itself. The children will take care of it!

Now comes the most delicate part: draw the wild garden! Before proceeding with the realization, it is always recommended to produce a small project that takes into account the space available in the wild garden, the use that will be made and the ideas of teachers and children.

You can also make more projects (maybe building patterns), and children can be named to choose the best!

Let's start with the plants!

1.1.4

As you can imagine, the presence of spontaneous flora represents a significant aspect of a wild garden to offer shelter to wildlife. However, it is often thought that to host the animals, it's necessary to have an entire forest, except for the insects easily visible also on a meadow. This is absolutely not true: flowerbeds and hedges allow many animal species to find feed and shelter.

Let local native plants grow

The first rule to follow is to let grow the plants that spontaneously were born in our garden and complete with local native ones, those species that would grow naturally in the place where you live: this point is a key factor in the realization of a natural garden. Through a very long period (thousands or millions of years) the local native species have adapted to the different environmental factors that characterize the treated territory, such as the type of soil, the rains and the temperatures of the place. This means that they will be able to react successfully to the various climatic afflictions (rain, drought, temperature variations, etc.) that they will front during the seasons. Moreover, unlike alien species of exotic origin, these plants will be the most suitable to offer shelter and food to the local native fauna, developed from very long times using the resources that they freely offer to all the "population" of the place: a forest, a meadow, a hedge or a garden.

Flowers and fruits all year round

No matter what season we are in: among the spontaneous flora there have been always some species that blooms or that makes its fruits available to wildlife throughout the year. Here are some examples!

The blackthorn (*Prunus spinosa*) blooms from the beginning of March and continues to flower until the end of May. Its beautiful white flowers that appear on the plant before the leaves, are an irresistible attraction and an excellent food for many pollinators such as bees.

The hawthorn (*Crataegus monogyna*) also blooms in spring, but its flowers appear a little later, between the end of March and May. This shrub produces aromatic flowers, an irresistible call for several pollinating insects such as bees, bumblebees and many species of butterflies.

The flowering of the elderberry (*Sambucus nigra*) is later. Its perfumed flowers appear from April to June and are very appreciated by many bees and butterflies.

Hawthorn

Elderberry

The fruits of the various shrubs are produced in different periods too, from summer to late autumn and winter months. For that reason, by combining in your wild garden shrubs and plants of different species whose flowers and fruits gradually follow one another in a continuous way, you will ensure to numerous birds and wild animals a non-stop and regular “distribution of food”.

These examples give us a precious and extremely interesting teaching: the planting of these plant species appropriately combined, helps to make our garden a lasting “dispenser” of food.

So, let’s try to copy nature by choosing native plants that bloom at different times, in order to encourage birds and other animals to visit us in any season!

Not only trees

Besides diversifying the plants according to the flowering periods, it’s also important to differentiate them according to their size. Where the vegetation is free to grow, we can find multiple layers, from the arboreal to the herbaceous one, passing through the shrubby, up to the leaf litter, the trunks and the rocks on the terrain. When selecting the plants to be placed, remember to choose trees, shrubs and small herbaceous to diversify the habitats that you will make available to the fauna.

The hedge

Without doubt, a good idea is to place the plants in your garden so that, besides forming groups of vegetables similar to large flowerbeds, they can model a hedge. It plays a key role in many features: as well as being an important landmark for several animal species, it protects the garden from the winds, producing a more pleasant environment

not only for the fauna! It's not by chance that in the past the farmlands were divided by hedges that, besides defining the border between adjoining properties, protected the farm and in the meantime favoured the presence of many animal species. Currently the hedges in the farming environment have almost completely disappeared to allow easier automated management of the fields. In addition, the wretched and spiteful profit policies, have literally destroyed almost completely these beautiful plant formations, both by dumping all sorts of poisons and chemicals, and by taking away their living space and leaving more and more to the massive single-crop farming, well agreed by the market laws but catastrophic for biodiversity. The hedge also plays a central role from a hydrogeological point of view: it's an important protective factor against soil erosion due to weather, rain and wind. In addition, it is highly efficient in retaining moisture that will then be reintroduced into the environment through the transpiration of plants: the effect that results are the formation of dew, which you know for sure.

The most interesting role of the hedge, however, is probably the ecological one, that is, what it plays in the dynamics of living communities: the various shrubs of our Mediterranean flora are an essential source of food and shelter for many animal species belonging to all classes, from insects to birds, to small mammals. Among the most representative shrubs of the hedge, may be noted the hawthorn (Crataegus monogyna), the blackthorn (*Prunus spinosa*), the rosehip (*Rosa canina*), the elderberry (*Sambucus nigra*) and the wild privet (*Ligustrum vulgare*).

Eurasian blue tit on hawthorn

What else can we say? From what we have learned so far, it's possible to carry out that making a hedge in our garden is definitely a great idea and is an excellent "investment" for the relevance of the landscape too, bringing so much "green" even in urban environments.

The garden of aromatic plants

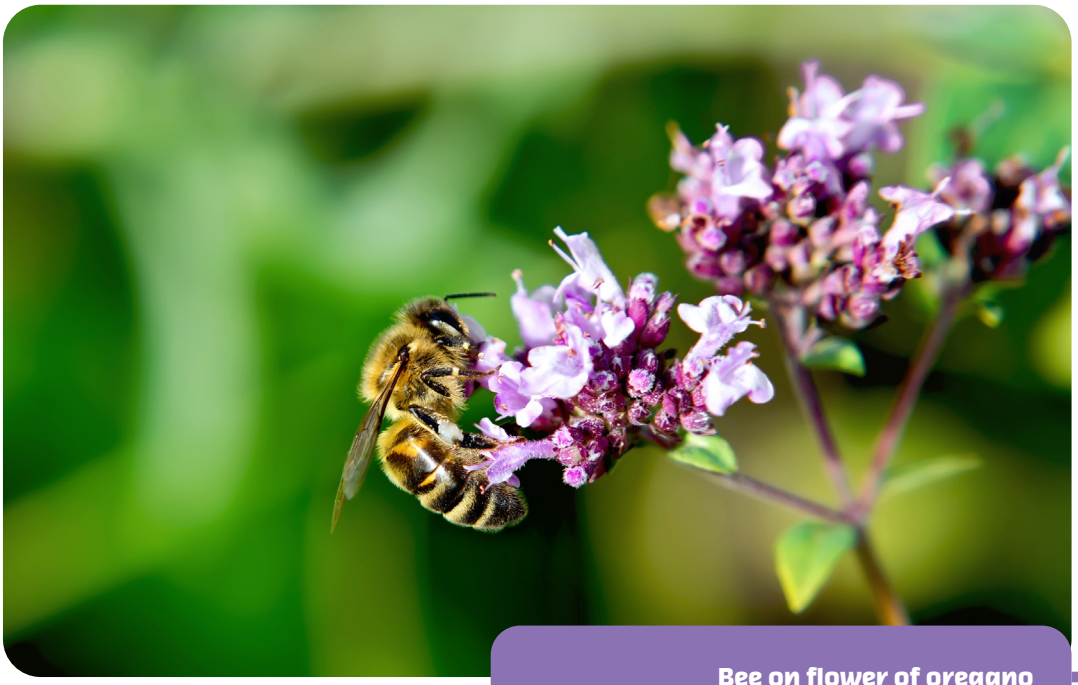
Have you ever been near a lavender plant? Well, if you said yes, you absolutely remember! Passing close an aromatic plant such as lavender, the main thing you can notice is definitely its scent. On the other side, their name is not occasional and it's not by chance that the aromatic plants are named so. In their seeds, leaves or bark, they produce specific essences which give them a mainly attractive smell. Aromatic plants can be arboreal (eucalyptus), shrubby (rosemary) or herbaceous (mint).

Lavender

It is very important that in the wild garden there is a corner dedicated to aromatic plants because these, in addition to being expressly charming to our smell and sight, play a key role: attract many species of helpful insects, which quickly rush attracted by their irresistible fragrance. Can you imagine the benefit of having these precious partners in your garden?

Here are some examples...

Oregano, thymus, mint and lavender are very appreciated by pollinating insects, called not by chance also "wedding bearers": it's also thanks to them that the pollen is transported allowing first the pollination and then subsequently the creation of the fruit.



Bee on flower of oregano

Borage, fennel, thymus and mint, attract ladybugs, extremely important insects used in biological control as they feed on aphids, also known as plant lice, which parasitize many plant species (some cultivable) causing damage to their foliage (see information sheet “ladybugs and other useful insects”).

Go to the information sheet for a list of the species that you can plant in your garden.

The meadow, a small microcosm

«Look at the lawn… What do you see?»

«Grass and flowers.»

«Only? Look better!»

At first sight, the lawn seems to us only like a green field full of coloured dots. In practice, it's an ecosystem, small or large, characterized by a wide range of plant species and represent the source of food and shelter for several animal species.

Like the hedges, even the meadows have suffered a considerable damaging decline with the introduction of intensive farming. It's therefore really important that even into urban spaces are preserved small or large patches of land, where the wild vegetation is free to grow. Making a lawn in school spaces is not difficult. However, although it is possible to buy mixtures of seeds of native species, it is always better to let nature do its own way. First of all, choose an area to be allowed to develop in a natural way: you will able to follow the first plant species that will grow (called pioneers) and those that will improve the biodiversity of your lawn step by step.

If you then observe well with a lens, you'll notice that the lawn will become the kingdom of insects. You'll see the flying ones, like bees and butterflies, while they move from flower to flower looking for nectar and pollen. Or even social ones like ants and so many others. You simply have to sharpen your sight and... leave for this exciting adventure!

The meadow is not only the kingdom of insects: birds and mammals may visit you looking for food! Remember that in this environment will find shelter even reptiles if you provide them a comfortable home. That's why we'll give you tips later, when we tell you how to build a pile of stone or wood...

Wetlands

1.1.5

Small wetlands can be considered real “coffers” of biodiversity. Although their dimensions are often very small and limited, these habitats include even 12% of the fauna of the entire planet. A very respectable wealth that surely makes you reflect! In the past, wetlands have been greatly despised, and instilled fear, sometimes giving rise to a real phobia. This attitude was mainly due to a particular reason: wetlands were considered to be unhealthy environments, outbreaks of the most awful plagues, mainly due to malaria that previously has inflicted many deaths. Things changed once the malaria nightmare was over. We have finally begun to understand the great ecological and naturalistic value of these habitats that welcome many animal species belonging to several Classes (birds, amphibians, fish, shellfish, insects and other invertebrates), constitute real “biodiversity mines”.

Wetlands include many types of habitats: lakes, swamps, peatland, rivers, streams, puddles and fountains, just to refer to some examples. One of the most representative habitats of wetlands is undoubtedly the pond. But what is a pond? Let’s give a correct definition...

Pupils collecting samples in a pond

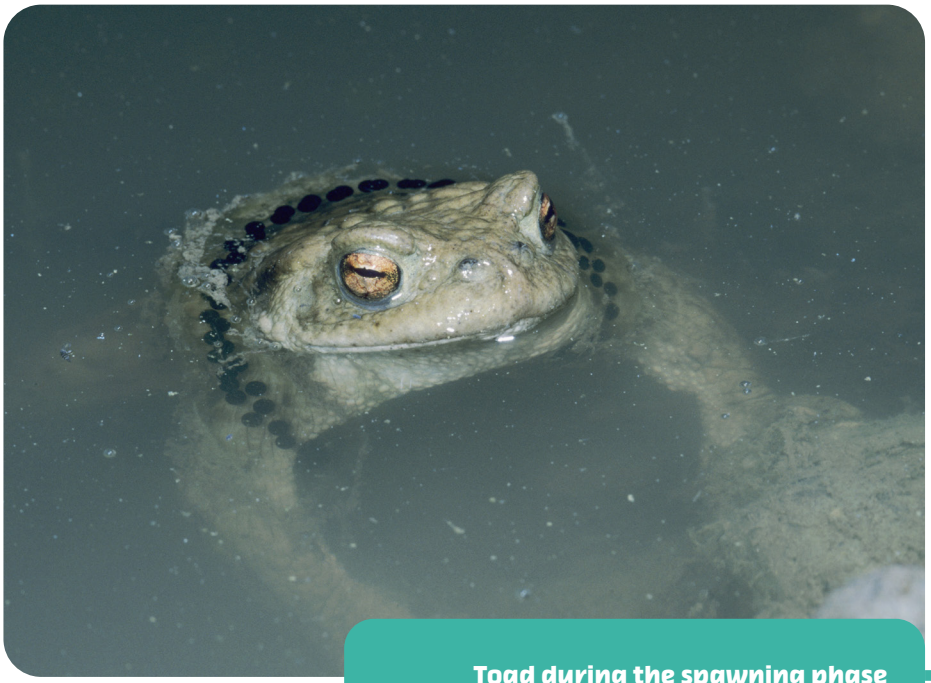
The pond

The term “pond” is used to describe a reservoir, usually small, characterized by stagnant and marshy water. This point has an important impact on the dynamics related to the seasons and on the life cycle of the community living in the pond. As you know, the water springs and the tributary channels tend to dry up in the summer, reducing or completely stopping their feeding activity. Besides that, here is another problem: the summer temperature increasing, which often reach very high values in the warmer months, enhances the water evaporation. Because of these phenomena, the pond is often reduced to tiny puddles disjointed from each other, even to completely dry up.

The environmental conditions of the pond make this space a quite “delicate” ecosystem, turning it into a prohibitive habitat for many living structures. Stagnant and low-oxygen water is not suitable for all living beings, only those who have adapted to conditions of great water and warm stress during evolution manage to live just fine.

Despite hard ecological conditions and small size, the pond is still a quite rich ecosystem, which hosts a living community of many animal and plant organisms belonging to a wide range of taxonomic groups.

Amphibians are exceptionally important for this small ecosystem and the pond is an environment of key relevance to this class of vertebrates. These swamps play an essential role in their biological cycle, representing the breeding spot for most species. Even the terrestrial species such as the toad and the salamander, which spend most of the year on the mainland, at the arrival of the reproductive season quickly rush into ponds, puddles, fountains and other types of collecting waters, where the coupling, the fertilization and the laying of the eggs will take place.



Toad during the spawning phase

In most cases, amphibians are found in ponds quite exclusively in the spring; occasionally their presence can be found exceptionally even in the summer. During the rest of the year, they live far away from the aquatic environment.

During the last years, amphibians have unfortunately been seriously under threat from pollution, environmental decline and transformation of habitats essential for their biological cycle. As a result, the design and creation of a pond in your garden are an extremely useful and valuable activity for the maintenance and protection of *biodiversity*.

The invertebrates definitely rule in this ecosystem, and ponds are probably the richest environments. Many species spend their whole life in the "liquid element", others instead live there only during the juvenile stage. Among the main aquatic invertebrates, remember several species of Odonata (dragonflies), Coleoptera, Hemiptera (water scorpion, water boatman, skater), shellfish, etc. Those of the pond offer us a significant selection of forms and lifestyles, are therefore extremely interesting to observe and represent at once a key element of the ecological balance of the ecosystem we are creating.

Blue damselfly, a dragonfly easily observable near the ponds

A central feature is that no fish are ever introduced into the pond. These ecosystems are characterized in nature by a high biodiversity, just because the fish fauna, awesome predator of invertebrates (in all their life stages) and amphibians, is not present. These small wetlands are usually not linked with lakes or rivers, so the fish cannot colonize them naturally, but only if introduced by humans, causing serious damage to the entire ecosystem.

At this point you will have understood how important it is that in your wild garden there is a small pond! Do you think it's a mission impossible? Don't worry, remember that even a small pool is enough for our animal friends and refer to the didactic cards for its realization!

Rearrangement operations of the pond in the Istituto Comprensivo Como Prestino-Breccia in the Regional Park "Spina Verde" (Como-Italia)

Host the small fauna in the wild garden

1.1.6

The nest boxes

The term *artificial nests*, or *nest boxes*, is used to mean a wide range of various items both for shape and size, usually handcrafted and destined to house and give shelter to a wide range of bird species. Their classic look is like a "box" and they are usually made of wood or more rare other materials (aluminium, fibreglass, cement, clay, mixtures of the previous two with the addition of clay, etc.). Shape and size are very different and varied. The most traditional type is the classic wooden box, usually designed for songbirds and other small sparrows, which is the "artificial nest par excellence" and today is very common in our public and private gardens. The wide range of nest boxes, however, includes many types of structures ranging from large nests designed for medium and large birds up to giant chimney nests, planned for big birds of prey. In recent decades nest boxes have become very important. Their positioning within natural, semi-natural or artificial areas such as parks, kitchen-gardens, lawn or other spaces surrounding our home, is definitely an excellent support to wildlife. The environmental decline, the human settlement and the progressive destruction of the natural habitats have caused that in the last decades, many wild species have even more problems to find natural refuges where to stay, to find shelter and to start a family. The modern houses are now devoid of those ravines that characterized the old ones, while the old secular trees, full of cracks and slits, have become even more rare, mainly because of the bad habit of cutting them down to make room for the young ones. That's why our winged friends struggle more and more to find a cosy home and consequently the positioning of nest boxes in the different green spaces is definitely an excellent support for our wildlife. In addition, we cannot overlook another extremely useful point: the installation of artificial nests in parks, gardens or in the surroundings of our houses, helps to increase the populations of insectivorous birds and raptors, excellent tools to keep under control the populations of rodents and disturbing insects. In this way we'll be able to stop using insecticides, rodenticides and other chemicals that are extremely dangerous to our health and to the safety of the environment.

Nest box for birds placed in a *wild garden*

Realization of a nest box for birds with the pupils of the Direzione Didattica 2 "Comparozzi" (Perugia-Italia)

The bat boxes

In addition to the classic nest boxes for birds, there are other kinds of "houses" for other species of animals belonging to our wildlife: the *bat boxes*. What are they?

The term *bat box* is used to identify some specific artefacts, especially designed as shelters for several species of Chiroptera, better known as *bats*. Like nest boxes for birds, bat boxes are mainly handcrafted and are very different in material, shape and size. Wood, cement, cement-sawdust or plastics are mostly used as building materials; the shape is usually rectangular, square, flat or cylindrical. The manifold types of bat boxes are expressly developed for different species and situations: each model adapts to the particular needs of the specific species. The *bat boxes* are usually located on tree trunks, walls of buildings, poles and other kinds of support, with the purpose of providing a suitable shelter to many Chiroptera.

As already said about nest boxes, the natural shelters for bats in recent decades have suffered a significant decrease too, becoming more and more rare. The oldest secular trees, full of cracks and slits, are often cut down to make room for the young ones; modern concrete buildings, very effective with regard to thermal insulation, do not have the ravines and the cavities characteristic of old farmhouses and country houses, besides being devoid of spaces such as garrets which our friends use as refuges. Several populations of Chiroptera are therefore experiencing a quick decrease, with serious impact on agriculture that in this way loses precious allies. To overcome this damage, in recent times we have seen a large diffusion

of *bat boxes* or *bat houses*, artificial shelters specifically designed for Chiroptera and used mainly to help our cute winged mammals. Installing one or more bat boxes in your wild garden is also very precious from an ecological point of view. They are exclusively insectivorous mammals and amazing night hunters. Each member can catch every night, even thousands of insects, including many belonging to troublesome species such as mosquitoes. Furthermore, being colonial species, they live in colonies sometimes composed by a very high number of "citizens". A bat box can sometimes house an entire colony of bats: can you imagine the benefit of hosting multiple colonies of these very useful mammals in your garden? They will take care to contain for free the populations of troublesome insects around you, without having to use insecticides and other chemicals so much damaging to our health and that of the environment.

Bat box placed in a *wild garden*

Realization of a bat box with the pupils of the Direzione Didattica "Franco Rasetti" (Castiglione del Lago-Italia)

The mangers

Inside a *wild garden* we cannot disregard the *mangers*. In theory, even just a saucer containing food for our little friends can be considered a "manger", although really basic and elementary. However, if you have enough space in your garden, we definitely recommend to set up a really well-equipped manger. But what are the mangers?

Goldfinch on a manger

These artefacts of different shapes and sizes are usually located near kitchen-gardens, terraces, parks and lawns, in order to feed numerous species of wild animals (especially birds) who benefit from them to eat the supplies offered. A wide variety of feeders are available on the market today: from the basic ones with a simple shelf (wooden table fixed to a pole), to the different hanging types, up to the hopper or double-hopper ones, which are the most complete and functional. Food must be made available during the winter period, when cold and bad weather conditions reduce the availability of sources and our little friends need an important caloric intake. Otherwise, during the summer season we strongly advise you not to feed wild animals, because during the breeding season, the growing young, need food of only animal origin (insects and other invertebrates) that the parents would not look for if we continued to put seeds in our manger. Moreover, if fed with seeds and vegetal substances, they would end up starved and die in a short time. In addition to the classic mangers there

are other kinds of hanging food dispensers that you could combine with those of your wild garden. Among the best-known examples are the "peanut necklace", exceptionally appreciated by the songbirds, the drilled wooden trunks (where pieces of animal fat are placed), the peanut basket and the small net.

Shelters and feeders, a substitute of nature?

It would be a mistake to believe that *artificial nests* and *mangers* are substitutes for natural shelters and make up for food lack. The positioning of such items cannot completely solve these problems. The alarming destruction of habitats remains the most serious problem and the main cause of the progressive loss of biodiversity that has characterized recent past. It's clear that nothing can replace a natural environment and therefore the best "care" to preserve biodiversity remains to save as much as possible the habitats of the various species. However, as already mentioned, the destruction of habitats in recent years has highly reduced the natural shelters of birds, bats and other wild species, which risk to no longer find food and places to shelter, sleep, and reproduce. In this case it is undeniable that installing artificial shelters and mangers, even if it does not completely solve the problem, provide to reduce it very much, revealing to be extremely useful to our little friends. We must therefore look at the installation of these artefacts not as a replacement of natural shelters, but rather as an additional device that will act as an aid to preserve natural habitats. In other words, *artificial nests*, *bat boxes* and *mangers* will never completely replace natural food and shelters; their function will be to support and integrate the amazing and huge wealth of nature.

The drystone wall and piles of wood

If you have time and patience, planning a drystone wall is surely a great investment for your garden.

The *drystone wall* is of different sizes, built with many blocks of stone suitably assembled together, but never joined by mortar, concrete or any binding material. Due to their features, this sort of wall plays a key role within the landscape and the natural environment, being also an important ecological niche. In addition to defining the boundaries, the dry wall performs several functions that are extremely useful for the dynamics of ecosystems. The first one is undoubtedly that of being an ecological corridor, namely a "vehicle" through which the micro-fauna has the chance to move and pass from one area to another, similar to what happens to the hedges: many species of insects, amphibians and small reptiles benefit from the drystone wall using it in this way. The opportunity of moving from one place to another, means that individuals belonging to different populations can interact and mate, thus promoting the genetic exchange, with a significant benefit for biodiversity. Moreover, all this occurs in synergy with agriculture, because many of these small animals are predators and the-

refore contribute to the maintenance of a healthy environment and free of parasites.

The *drystone walls*, also create especially suitable conditions for the growth of spontaneous vegetation, which flourish richly among the stones and behind the walls giving rise to an ecosystem of great natural value.

This is obvious in nature! In your wild garden a similar role could be carried out simply by a pile of stone positioned in a sunny place (it will not be so difficult to watch the lizards warming in the sun!). This will be an excellent shelter for many small and medium-sized animals, which will find a comfortable and welcoming home between the spaces and ravines of the structure.

The woodpile

Even a pile of logs in a shaded corner will surely be an excellent shelter for many “guests” in your garden. Frogs, toads, shrews, hedgehogs, various insects, centipedes and coleoptera will use the available trunks as a comfortable home. We suggest placing the pile in an area that is shaded for most of the day and has a cover nearby. We also recommend using an assorted blend of woods, better if 15-25 cm in diameter and possibly with bark. Absolutely avoid the treated wood! In addition, under the pile of logs you could even place a box for hedgehogs.

Woodpile in a *wild garden*

The bug hotel

During the last years, some new structures have taken hold in the *wild garden*: they are the well-known bug hotels, very special artefacts that represent a natural evolution of the more basic artificial nests for insects. These man-made items are generally large in size, heterogeneous in shape and built in most cases using natural materials or recycling artificial ones no longer suitable, after reshaping them. The role of bug hotels is to serve as "shelter" for the entomological fauna of our house. In other words, we could define them as gigantic "flat buildings" where many species of native insects will find shelter and stay, most of which are extremely important to the wealth of biodiversity and particularly useful for agriculture and ecological balance. Among the most important species there are many pollinating insects such as bumblebees, wild bees, mason wasps, butterflies, etc. Between the useful insects, there are instead some entomophages species such as the ladybug and the chrysopa, formidable predators of Phytophaga such as the aphids. They contain their populations, preventing excessive proliferation. The Forficula is also one of the commonest guests of our bug hotel, where it takes refuge with very pleasure. Its presence is absolutely to promote, it is in fact an "optional entomophage" that frequently combine a phytophagous diet with the predation of several insects often injurious to our cultivated plants. The materials utilized to build bug hotels are several and very diversified, but it's however essential that they are hollow, a feature that makes them particularly suitable for creating small ravines: marsh reeds, bamboo reeds, hollow stems of herbaceous plants, branches with soft or spongy interior easily removable from insects (elderberry, umbellifers), bored trunks, stones, pine cones, soil, clay, straw, hay, empty shells of gastropods, bored bricks, coiled natural fibres, dried leaves, etc.

Construction phase of a bug hotel in the garden of the Direzione Didattica 2 "Comparozzi" (Perugia, Italia)

Bug hotel realized in a *wild garden*

Shelters for hedgehogs

As you know, the hedgehog feeds of several invertebrates, some of which belong to phytophagous species that may cause some damages to the cultivated plants: it is particularly greedy of insects, snails and slugs, which it devours in huge quantities. As a result, this charming mammal is another precious support to your kitchen-garden and yard, another guest that should definitely be encouraged! For this purpose, we recommend placing in your wild garden some shelters specially designed to offer our little friends a safe protection from cold, predators and other risks. The shelters for hedgehogs are very heterogeneous in shape and construction materials: from the different types of rectangular wooden boxes to the famous "dome for hedgehogs" (made of sawdust, clay and concrete, light and insulating materials that permit good transpiration and warmth), which the hedgehog may occupy both during winter hibernation and throughout the year.

Shelter for hedgehog in a *wild garden*

The wildlife garden in the four seasons

1.2

Actors and spectators in the great "Theatre of Nature"

The "Temple of Nature" of which you are the creator, the result of your care and devotion, can be seen as a "dynamic organism" in continuous evolution. In fact, it always changes with the alternation of the four seasons. That's why stopping in the wild garden of your school or your home, will permit you to observe the multiple changes in nature during the four seasons and twelve months of the year. Each season is something special and is different from all the others, distinguishing by its exclusive features. Stopping every day of the year in your garden, will give you the chance to attend an extraordinary range of phenomena, shown by the many organisms that populate your "piece" of the planet. Looking to the several and amazing life phenomena that plants and animals will reveal to your eyes throughout the seasons, you will have a valuable opportunity. In addition to being a privileged spectator sitting in the front row, you will also have the role of a lucky actor who will be offered a unique chance: join directly and actively in the great "Theatre of Nature"!

Spring

As you surely know, spring is an unreliable season and very often it behaves in an unexpected way, alternating hot sunny days to nights with sudden frosts. Besides these unusual contingencies, usually spring is anyway the "season of awakening": after overcoming the first unexpected hitches, the new season becomes unstoppable and life blow up everywhere! Let's take a closer look at what's going on in your little Eden...

Many ***birds*** get ready to return from their hibernation places to give life to the hatching, so they rarely take a plunge into the search of well-supplied mangers where they can eat delicious morsels. Even if insects and invertebrates of different species begin to move on in early spring, we recommend that you leave the mangers for a while longer; your little friends may still need some additional portion, considering that natural prey is still few. You could find out your winged friends as they prepare to build the nest by going back and forth with many twigs and little heaps of musk. In order to avoid compromising hatching and survival of the brood, we recommend to place nest boxes and hatching sites in locations that cats cannot reach.

Eurasian blue tit

The general awakening of the "population of your Temple", also involves other nice friends such as ***frogs*** and ***toads***. After the awakening from the winter hibernation, the amphibians quickly rush towards the pond, taking strongly place along the banks where they give life to their typical "singing concerts", true wedding parades with which the male throws his irresistible call to the female.

When spring comes, we can admire a lot of ***butterflies*** appearing; after having wintered at the adult stage, they can already get back at the beginning, as soon as the corollas of the first flowers open and offer it their delicious nectar.

The brimstone is among the first butterflies that are observed flying in spring

One of the main players of spring is surely the queen of the ***bee***: wakes up from winter hibernation and looks for a suitable place where to settle a new nest and found a new colony. Unlike the domestic bee, this extraordinary pollinator every year starts again, founding a new colony in spring.

The explosion of life produced with the beginning of spring, continues with power and vitality; with the increase of the temperature, other amphibians like the tritons go into the water where they will stay until the end of the summer.

The dragonflies overlook the streams and the basins of water, hunting for their favourite preys. Even the ***ladybugs*** are among the most dynamic insects that in spring are very busy to lay many eggs, giving great pleasure to your plants: larvae and adults are exceptional assistants, devouring countless aphids and other "enemies".

As summer approaches, the explosion of vital phenomena continues to increase, reaching its peak. The flowering spreads everywhere, and every corner is full of flowers of all kinds, delighting us with their beautiful colours and scents. If you look around, you will be able to see many extremely educational shows of the nature. The eggs of many ***birds*** have already hatched and the young have been born: you can observe the constant bustle of the parents who carefully toil to bring them caterpillars, insects and spiders. The nice ***hedgehogs*** start their reproductive season, which can last till late summer.

Dragonflies fly intensely in the pond with great energy and it will not be difficult to observe the first tadpoles of frogs and toads.

The eggs of the ***ladybugs*** hatch, giving rise to many larvae, awesome predators of aphids.

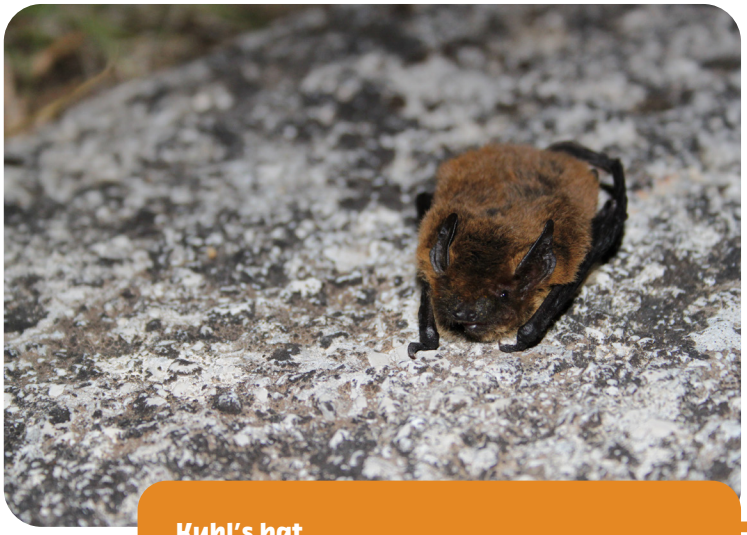
The ***squirrel*** is also very active: in the morning or in the afternoon you can easily "surprise" him on the trees or on the ground, while he is very busy in the search for food, mainly nuts and seeds, berries, mushrooms, bark, eggs and caterpillars.

Squirrel

Summer

As you know, summer is the open-air season: this is the period of the year when we spend more time outside the home. Therefore, it is also the period, together with spring, when you will spend more time enjoying your wild garden: at this time of the year offers shows and observations at will.

A high number of ***flying insects*** sip the sweet nectar from the many flowers, consequently attracting numerous ***bats***. When it is evening, they rush to hunt for their favourite prey, flying over the surface of ponds or skimming the trees. Everywhere is crawling with insects.



Kuhl's bat

Literally bewitched by the exciting scent of the flowers, ***bees*** and ***bumblebees*** search their corollas, capturing great quantities of pollen and nectar and promoting in exchange the "wedding by proxy" as it has been for millions of years now.

Bumble bee sucking nectar
(photo by A. Morawiec)

Observing carefully, you will see several ***Syrphidae***, a family of Diptera characterized by a marked mimicry, which "copy" the wasps in such an extraordinary way to be easily confused with them. The ***cabbage butterfly***, which you will often see flying in this period looking for cabbages and other Cruciferae, is very active too. Newly got out of that extraordinary event called ***metamorphosis***, the ***ladybugs*** are freed from the chrysalis exhibiting their pale and soft colours: their wan livery, clearer than that of the parents, allows us to distinguish the young ***ladybugs*** as individuals of the new generation.

Many young birds prepare to leave the nest for venturing into the independent life, and it is not rare that some "rookies", a little too hasty, fall to the ground. If you do not have cats or even nearby, do not interfere and leave them alone: parents will continue to take care of them and to feed them, even on the ground, as they have done until now inside the nest. The ***dragonflies*** finally leave the larval stage and, through the miracle of ***metamorphosis***, they head towards their adult life, leaving only the remains of the "old life", which lay down in the form of exuviae on the stems of aquatic plants. The winged ants, on the other hand, fly to venture towards "new shores", where they will start new colonies. ***Frogs***, ***toads*** and ***newts*** walk towards their progressive, slow and gradual metamorphosis, which will lead our nice amphibians to transform gradually. From small aquatic larvae equipped with gills (the tadpoles) they will transform into essentially terrestrial adults, without tail, but powered by four legs already at the beginning of summer! Late in this season, you can admire many young completely transformed leave the pond, while it is easy to see around many young common toads in the water or on the mainland.

Spotted newt larva

With a little bit of curiosity and paying attention to the lawn, under the turf you can see many interesting life forms. Despite its dismissed and not at all luxurious appearance, the "prince of the lawn" is definitely the ***earthworm***, which since the dawn of time continues to play its priceless role in the maintenance and formation of the ground: actively digging its tunnels, this humble invertebrate continuously eat soil and then expels it later in the form of humus. In this way it constantly keeps the soil soft and enriches it continuously. In the driest periods the ***snails*** go to hide in the deepest layers, while a few centimetres below the grassy surface, a myriad of fascinating

and lively creatures thrives, such as ***beetles***, ***centipedes***, ***earwigs*** and ***pill-bugs***, just to name some. These are the preference menu of many vertebrates such as ***blackbirds***, ***starlings***, ***thrushes***, ***jackdaws***, ***hedgehogs***, ***foxes*** and ***badgers***, who hunt them with an awesome hunger. As a result, if you let your natural lawn grow, you can host many of these charming friends!

Blackbird looking for food

One of the most usual "citizens" of the meadow is undoubtedly the ***mole***. Despised by many greengrocers for the habit of digging tunnels, is instead an excellent assistant of the garden. Its diet is in fact constituted by an abundant quantity of soil microfauna, which includes many invertebrates often harmful to agriculture, such as snails, insects and their larvae. Moreover, every cloud has a silver lining: although aesthetically they are not the best for a meadow, the mounds of earth that the mole leaves to its passage make the soil particularly "hospitable" for the small eggs of the solitary bees, thus facilitating the deposition.

Autumn

As you know, in the collective imaginary, autumn often takes on a taste with melancholic shades, although it is undoubtedly, with its deep and intense colours adorning the plants, one of the most beautiful seasons of the year. For a naturalist it obviously makes no sense to speak of "beautiful" or "bad" seasons: each one is wonderful for its own specific characteristics and you, as a good rookie, will certainly learn to appreciate the smooth changing. The Kingdom of Nature is vital energy, and the four seasons constitute a cycle of it! Each one is a phase of the circle and could not exist without the previous one, it is an introduction to the next one and constitutes its preparation. Look around and watch carefully: do you see that beautiful colours? Why so much splendour? What is so beautiful?

The beautiful green painting that in summer outlines the leaves of the trees and definitely expresses energy, strength and vitality, is due to the activity of chloroplasts, special organelles existing in the cells of the plant parts exposed to light. ***Chloroplasts*** have the task of capturing sunlight and transforming it into ***chlorophyll*** through ***photosynthesis***. They behave like natural "solar panels", made-up and patented by nature much earlier than the official creator of these complex engineering devices. Like all the natural processes, ***photosynthesis*** is one of those of an energetic nature: for it to be carried out, it takes ***energy***! Hardwoods get their ***energy*** from the soil; through the roots they absorb water from the humid soil, very rich in many nutrients melted in it. The absorbed water, flows up the trunk and reaches the leaves, where the evaporation takes place: it is the non-stop cycle of the ***lymph***! When the first cold arrives, however, the water present in the soil may freeze and be no longer available for the plant. The roots can no longer absorb anything but the leaves, "stubborn" and "obstinate" like few in the world, continue with decision to evaporate the water and as a result the plant risks dying dehydrated. So what? As often happens facing our existential problems, when things get complicated and obstacles seem impossible to overcome, the wisest decision is to stop and interrupt everything temporarily: we'll get back later, in the spring... That's exactly what our hardwoods do: they momentarily interrupt the flow of the lymph and remove chloroplasts and chlorophyll from the leaves, which due to this pause are dyed with their amazing yellow, red and orange pigments.

And now let's take a closer look at what's going on in your backyard in the autumn!

This step of ***temporary rest*** is necessary in order to reactivate in the spring the flow of life and the dynamism of the organisms. To allow the seed to germinate again, the autumn and winter rest is essential, because it is the preparatory phase. In autumn the "preparation of the soil" begins to transform it into the welcoming "mother's womb", which will get the seed at the arrival of the first warmth. The leaves that fall to the ground will produce the ***humus***, consisting of dead leaves and other organic materials. This process starts in autumn and its maturation can continue throughout the winter. A key role in the development of the ***humus*** is played by the ***earthworms***, "laborious workaholics" so dear to the great naturalist **Charles Darwin**, who in his home garden spent for them, years of in-depth and careful study.

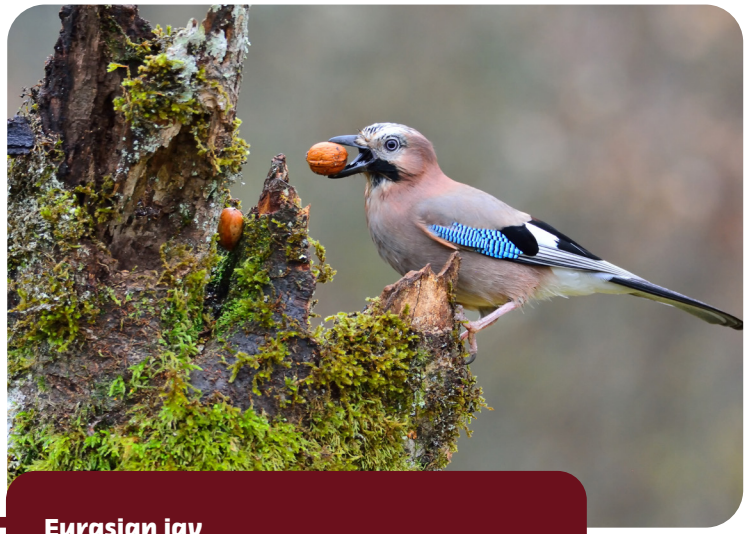
Even if it may still happen to see around some bee or some other pollinator, the activity of these insects is now coming to an end: the colonies of ***bumblebees*** and ***wasps*** fall apart and the laborious ***bees*** crowd very numerous to form a compact cell that draw close to the queen, keeping it warm... There are very few ***insects*** around and in this lack the ***birds*** lose a precious "dish" of their menu, but be sure that not everything is lost! Luckily, the bushes and the shrubs are often full of ***berries*** and ***seeds***, excellent and energetic food for many ***birds***.

Earthworms, precious partners

Insectivorous birds that feed on flying insects, such as the swallow, travel to Africa, where they spend most of their lives and then return to us in the next breeding season. On the other hand, the insectivores that found their diet on hibernating insects in the bark, do not migrate and spend the winter here with us. Besides, why would they? Their prey is also available in winter!

If you sharpen your sight and get used to focusing even the "little things", during this season you will notice a very bizarre fact: the ***spiders*** of your garden (and their webs) will seem much more than in the summer, quite an invasion... It's just an impression indeed: the ***spiders*** have not increased at all and are always the same! So, why this optical illusion? It's simple: during the autumn, our most common spiders reach the adult stage at the same time and, more or less simultaneously, they weave their beautiful webs. In addition, the early autumn lowering, promote the formation of the ***morning dew***, which makes the webs much more visible, allowing us to focus them better.

Many ***birds*** visit the bushes for pecking the ***berries*** and collecting the ***fruits*** available on the ground, what remains of the old season. ***Squirrels*** and ***jays*** are very busy to store ***nuts***, ***acorns***, ***hazelnuts***, ***chestnuts*** and several ***seeds***. The ***jays*** are very common, and many ***birds*** get into the habit of spending the night inside the nest boxes, which they utilize for shelter from the cold. Finally, the decaying wood is populated by a multitude of ***mushrooms***, awesome decomposers essential to the ecological balance of the ecosystem.



Eurasian jay

Winter

As we have seen, the arrival of autumn is the step in which the lowering of the "thermostat of Nature" begins: slowly and gradually, living organisms and the whole ecosystem significantly reduce all their activity by preparing for a winter rest. The phase of dormancy started in autumn, continues in the following season, the winter, which officially starts on December 21, the date that match up with the winter solstice and with the shortest day of the year. From the next day, the days will gradually begin to get longer, even if at the moment the phenomenon is so gradual that it is practically undetectable. And now let's take a closer look at what happens in winter in your garden!

The ***seeds*** of the plants are completely inactive. They sleep underground and can wait, with that enviable and admirable patience from which we humans, eternal eagers, have only to learn. The ***seeds***, therefore, quietly wait for the favourable moment to germinate, as soon as the first warmth arrives. For their part, many insects rest inactive inside cracks, interstices and empty spaces located between stones, rocks and hollow stems of vegetables. ***Frogs*** and ***toads*** are no exception, they retire by hiding in the mud, among the leaves, waiting patiently for the arrival of the first warmth. Newts do the same, but prefer to spend dormancy under trunks and bark in the undergrowth closest to their pond.

Hedgehogs and ***bats*** have literally sunk in the "arms of Morpheus", without the need of valerian or passiflora, nor even less of Valium and other synthetic sleeping pills... The same applies to reptiles, which spend their winter in ***hibernation***, an instrument through which organisms minimize their "biological thermostat". In other words, they reduce all their functions: breathing, heart rate and body temperature (hypothermia). Basically, when resources are insufficient and energies are minimized, it's better to opt for an opportune "Austerity" and save as much as possible the little available...

But be careful, not everyone sleeps... there are also those who prefer to spend the winter in full activity. Every choice is good and honourable, but on one condition: those who make this choice must be aware that it is certainly not an easy way, nor free of difficulties. The ***birds*** are an example: to stay awake and perky in the cold winter months, they are busy throughout the day in the continuous and spasmodic search for food, the only way they have to fill up with energy and keep their body temperature constant. We suggest you to spread large amounts of fat balls and peanuts (not roasted or salted), which you will place on the mangers or on the ground. Some birds do not like to visit the mangers and prefer instead to feed on the ground.

The soil preparation phase, already started in autumn, gradually continues underground in winter, day after day: ***bacteria***, ***moulds*** and different ***micro-organisms*** constantly transform rotting foliage and roots into fertile soil. The ***formation of humus*** is

European robin on a manger

achieved through the phenomenon of the ***demolition of organic material***. As described in the autumn chapter, ***earthworms*** play a key role in soil formation: they eat it, digest it and then release it again in the form of excrement, rich in humus and nutrients. In this way, these laborious annelids contribute greatly to enriching the soil, making it extremely fertile. In addition, ***earthworms*** continuously dig the soil, creating spaces that allow the air to flow, fundamental to keep it soft: they are definitely precious and willing "workers of Nature!"

In late winter, towards February, we begin to appreciate the lengthening of the days. This undoubtedly affects all the population of the garden, who begin to show a slow but appreciable vitality. In other words, nature slowly switches into the awakening phase!

The lovely and gentle ***ladybugs*** wake up from the hibernation period and slowly return to their activity, as if to wish us "good luck".

The involvement of families and local community

1.3

In addition to the precious benefit of increasing biodiversity, the planning and construction of a wild garden is definitely an extremely positive activity also in terms of socialization. Taking care about a small ecosystem that essentially represents a small community, and doing it together, helps to develop in children a remarkable empathy, both towards others and towards all life forms.

The wild garden, however, is not only restricted to promoting the sociality between children and schoolmates. Because of its nature and its setting, it is very well suited to play the role of "bridge", as a way of communication between different generations and age groups. The creation of a wild garden can be developed to involve all members of families and the local community, not only small pupils. An extremely important involvement could concern older people. Due to the generation of belonging, these social groups come from a life experience that has allowed them a more direct knowledge and contact with nature and the different activities related to it. Seniors will therefore be able to play a key role in sharing specific skills with children, passing on to the new generations precious knowledge that would otherwise risk being forgotten and that we could lose forever in the years to come. This is particularly useful also for another reason of key importance: the involvement of old people in this project helps to reduce significantly their social isolation.

But the role of the *wild garden* as a "bridge" does not end here: This project also allows schools to connect with local companies and groups through the request for sponsorship or voluntary assistance.

Let's found a committee!

To plan a school garden could be enough in theory only one prepared and strongly motivated "manager". However, it is highly recommended to set up a committee from the start of the project: "unity makes strength", and this way to go will surely help to ensure long life to your wild garden avoid the individual overwork. This committee will have the role of taking some essential decisions concerning the future development of the project: how this "creature" should be, how it should work and for what purpose it will be used. At the beginning, the committee will work as a pure planning authority and then, in a second step, as a real operational structure. If we decide to involve the local community in the creation and maintenance of the wild garden, it is important that there is a steering committee that supposedly should be constituted by 5-10 members who will chair the following areas:

- Head teacher

- Teaching staff
- Representative of pupils
- Representative of parents
- Volunteers of the community

The main objective is to bring together a number of individuals, animated and united by the same passion for the project, so that the various members can put together a wide range of skills and play several roles during the different phases of the project.

The committee may be organised as a normal board headed by a chairman with the task of organizing meetings and communicating details, but it's otherwise possible to move towards something more informal. Whatever your choice, make sure your school administration is involved and informed about everything. It is also essential to involve parents from the beginning, which will lead families to take on greater responsibility throughout the process.

Political, educational and social value of the Wild Garden

1.4

In 2020 the European Commission has adopted **the EU Biodiversity Strategy for 2030** and an associated **Action Plan**, a new long-term plan for protecting nature and reversing the degradation of ecosystems. It aims to put Europe's biodiversity on a path to recovery by 2030 with benefits for people, the climate and the planet. One of the part of the EU Biodiversity Strategy for 2030 focus on green infrastructure. Green infrastructure includes biodiversity-rich natural areas such as woodland, ponds or uncultivated fields. But green infrastructure also includes semi-natural spaces such as parks and private gardens, or hedges and shelters (artificial features built to enhance ecosystem services or assist wildlife movement), such as green roofs and walls or eco-bridges and fish ponds. It can even be enhanced by individual actions, such as collecting rain water or leaving parts of a garden unchanged to provide a home for wildlife and protect biodiversity. Therefore, wild gardens are part of the European green infrastructure and help to achieve goals set by the EU Biodiversity Strategy for 2030.

Nature is also essential for achieving the **Sustainable Development Goals** (Transforming our world: the 2030 Agenda for Sustainable Development). Taking into consideration that the Sustainable Development Goals are integrated and indivisible, current negative trends in biodiversity and ecosystems will undermine progress towards 80 per cent (35 out of 44) of the assessed targets of goals related to poverty, hunger, health, water, cities, climate, oceans and land (Sustainable Development Goals 1, 2, 3, 6, 11, 13, 14, and 15). Maintaining biodiversity in good condition, safeguards achieving most of the goals described above.

Nature-based solutions, such as wild gardens, can be cost-effective for meeting the Sustainable Development Goals, especially in cities, which are crucial for global sustainability. Increased use of green infrastructure and other ecosystem-based approaches can help to advance sustainable urban development while reinforcing climate mitigation and adaptation.

Urban key areas that allow the preservation of biodiversity, should be safeguarded. Other solutions can include retrofitting green and blue infrastructure, such as creating and maintaining green spaces and biodiversity-friendly water bodies, urban agriculture, rooftop gardens and expanded and accessible vegetation cover in existing urban and peri-urban areas and new developments of such facilities.

Important positive synergies between nature and education (Sustainable Development Goal 4) were found. Only well-educated people, with high environmental awareness are able to wisely take care of nature. On the other hand, wild gardens may be a place for successful and professional nature-based education.

There is a critical need for future policy targets, indicators and datasets to more explicitly account for aspects of biodiversity and their relevance to human well-being in order to more effectively track the consequences of trends in nature on Sustainable Development Goals.

Wild gardens as small clusters for protecting local biodiversity, can be integrated into policy-making and decision processes. An understanding, consideration and valuation of local biodiversity are necessary for a well-managed environment as an obligation to future generations and out of respect for our surroundings, since nature often provides the most sustainable, cost-effective solutions.

State of knowledge

2.1

2.1.1

Wild Gardens projects in the world

Wild Gardens projects in the world

The Wild garden was born from the turn of the 19th and 20th Centuries as a trend, initiated by the Irish journalist William Robinson, and spread rapidly throughout Europe in the 20th and 21st Centuries. His main idea was to replace boring Victorian garden arrangements with a bit of "controlled chaos". Starting from this concept, were created gardens in semi-natural conditions, so that they are as close to nature as possible and promote not only the conservation of biodiversity in an urban environment, but also the observation and knowledge of the species that inhabit it. Wild gardens are quite common in Great Britain and North America.

Currently, wild gardens are established not only in villages; they are especially valuable in cities where natural biological diversity is disappearing and in many contexts: from school gardens to private ones, from urban to more rural environments. Many national and international organizations are engaging in projects aimed at preserving biodiversity by promoting the idea of a wild garden.

Here are some of the main projects promoted:

The Wildlife Garden project

The main goal of this UK organization is to inform how to provide food, shelter and breeding spots for the wildlife in personal gardens. Persons - volunteers who are involved in **the Wild Garden Project**, want to spread the information and inspiration to create personal own little wildlife havens. They have tops and advices for everyone, either living in the countryside or in a city, whether owning 50 acres or a balcony.

They are always on the lookout for writers, filmmakers and photographers who share the same passion for wildlife and desire to help conserve it. The Wildlife Garden Project contains a lot of interesting videos as well as practical tips and advices for wild gardens. Through the website you can also buy t-shirts, bags and other things and support the activities of the organization.

Building Sites for Butterflies

It's well known that in United Kingdom many studies focus on butterflies, moths and their environment. Butterflies and moths are sensitive indicators of the health of the environment. For many years a decline in the population of these insects has been observed. Therefore, it is necessary to create and preserve wild places where these animals could live.

Butterfly Conservation's '**Building Sites for Butterflies**' program, advocates that the built environment should be better designed and managed to support wildlife, including butterflies and moths. They offer practical advice on how to create and look after grasslands in urban landscapes that are not only full of wildflowers and pollinators, but that also cost less to manage than standard amenity grassland. It is part of a bigger project focused on butterflies and moths conservation.

Kingsbrook, a new era in wildlife-friendly housing – Royal Society for the Protection of Birds (RSPB)

The RSPB (Royal Society for the Protection of Birds) is a British non-governmental organization dedicated to the protection of birds and their habitats, especially the endangered species. It was founded in 1889 as a protesting association against the use of feathers and skins of small birds in the clothing industry. The RSPB has over 1 million members, about 1,300 employees and 13,000 volunteers work for it, which makes it the largest organization of this type in Europe and one of the largest in the world. Currently, it cooperates with public and government administration, participating in the development of nature conservation policy. Moreover, it carries out various projects aimed at the preservation of bird habitats and their protection. The Society has over 200 nature reserves in Great Britain. The RSPB is working with Barratt Developments and Aylesbury Vale District Council to set a new benchmark for wildlife-friendly housing. The project "**Kingsbrook, a new era in wildlife-friendly housing**" is aimed to planning a new residential space with the use of wild garden elements. The project assumes that during the Kingsbrook development 2450 homes will be constructed. It has already resulted in the inclusion of bat-boxes and nest-boxes, the retention of greenspace and the planting of orchards as well as hedgehog highways among the many measures taken to ensure wildlife thrives throughout the area.

Gardening for Wildlife – The Canadian Wildlife Federation

The Canadian Wildlife Federation is a Canadian non-profit organization dedicated to wildlife conservation. CWF's Gardening for Wildlife program encourages Canadians to transform local gardens into wildlife-friendly habitats. Participants are supported with resources and information on making their gardens suitable for wildlife. They can contribute to citizen science through the iNaturalist network and learn and share with the online community. Those who certify their wildlife-friendly gardens receive official recognition from CWF.

Gardening for Wildlife – The National Wildlife Federation

Part of the Garden for Wildlife is a The National Wildlife Federation's Community Wildlife Habitat™ program that provides community leaders with a focused framework for restoring wildlife habitat and engaging community members. The goal is to attain the National Wildlife Federation's esteemed certification as a wildlife-friendly community. Through the Community Wildlife Habitat™ program, communities are enhancing and restoring wildlife habitat in urban and suburban areas across the US. More over close to 200 colleges and universities have been certified under the National Wildlife Federation's Certified Wildlife Habitat® program.

Great Britain and North American countries are the leader in running wild garden projects. This idea is slowly reaching other European countries as well. Many local NGOs undertake projects related to introducing wild garden elements to cities and built-up areas. These activities include setting up urban meadows, building boxes for bats and birds, and collecting rainwater.

LIPU Milano

If you wish to improve the living conditions of birds, LIPU teaches you the principles that need to be respected for creating a natural garden with indigenous shrubs and untied meadows, which considerably increase for birds the chance to find food., with bushes, dense trees and climbing plants that give it the ideal ecosystem to build nests and shelter from predators.

Wild Garden schools' projects

2.1.2

Many recent studies, have shown that children today spend so little time outdoors that most common wildlife remains totally alien to them. The realization of a Wild Garden at school, offers several learning opportunities, both practical and academic, promoting simultaneously a connection with nature. Children are happier, healthier and more creative when they are connected to the natural world... There are many worldwide organizations, federations and companies, which promote the creation of wild gardens even in school yards, with the aim of protecting and increasing the bio-diversity at the same time (especially in the urban areas where it is most affected), and to provide children and young people with a safe and attractive place to discover the wildlife of their area.

Many North American realities move on this front. At European level, the United Kingdom is among the nations that mostly promote the realization of school wild gardens. Below is a brief description of some of these main organizations, some of which have already been mentioned previously for wild garden projects around the world, but with a specific focus on school actions.

In the U.K. the network of educational institutions that work with students outdoors or that involve them in environmental awareness programs is very large and well developed. There are also national associations and networks, affiliated with other international ones, through which it is possible to find innovative ideas on the creation of Wild Gardens in schools. For example:

Royal Horticultural Society.

Encouraging wildlife in your school garden. The RHS Campaign for School Gardening inspires and supports schools to provide children with gardening opportunities to enhance their skills and boost their development. The company claims that creating wildlife-friendly habitats in the school garden, is beneficial for birds, beetles and butterflies to find food and shelter. Moreover, from an educational point of view, it provides many teaching and learning opportunities throughout the curriculum. It also gives guidelines for increasing the amount of diversity found in the schoolyard.

Willows Hedgehog Rescue

Non-profit organization engaged in the rescue, rehabilitation and release of hedgehogs found injured. In addition to this, also provides education and awareness meetings to schools. One of the projects with which it operates towards the schools is the "Schools Wildlife Garden Project", whose aim is promoting them to provide, in their own yard, habitats for wildlife, through the realization of a wildlife garden.

The National Wildlife Federation

The National Wildlife Federation, is an American federation whose objective is to preserve and provide the wealth of the wild fauna in the entire territory of the United States of America, and between the several actions that it carries out, from 1996 strives to assist the schools in the creation of Schoolyard Habitats. Schoolyard Habitats build and recover wildlife habitat on the school grounds and at the same time providing outdoor classrooms for learning. Currently, there are over 5,000 schools that have been certified through this program.

Canadian Wildlife Federation

In Canada, the Canadian Wildlife Federation, whose mission is to protect and inspire wildlife and habitat conservation across Canada, promotes a school program on pollinator conservation: WILD Spaces. This plan, allows teachers to guide primary school students with the knowledge and learning of pollinators, to create pollinator habitats in their school gardens, observe and document pollinators in the garden and share their experiences with other participants in the program.

Maryland Association for Environmental and Outdoor Education

In the State of Maryland (U.S.), the Maryland Association for Environmental and Outdoor Education (MAEOE), promotes environmental awareness, supporting, among the different subjects, teachers and students in the implementation of sustainable activities. One of the tools with which it achieves this goal, is the program "Maryland Green Schools", which recognizes those schools that include environmental education in the curricula and approach the environmental issues of the community in which they live. Among the recognized sustainability practices, is the realization of wild gardens in school yards, to show students how to have a positive impact on their world, creating gardens devoid of pesticides, full of native plants, that attract wildlife and make the ecosystem of their community healthier.

Guides and web sites about/related to wild gardens

2.2

Wildlife gardens can increase the biodiversity of your school grounds, schoolyard, home, or company where you work, particularly in urban landscapes and provide a safe and attractive place to learn about wildlife. In addition, they provide peaceful areas that can be used for informal and curriculum activities as well as staff meetings.. School wild gardens are becoming increasingly important shelters for wildlife and also provide children and teenagers with a first-hand experience of the natural world through study and practical garden care. Many natural habitats are disappearing due to human activities such as pollution and house building, and many species, once common, are now struggling to survive. The stag beetle, the dormouse, the bluebell and house sparrow are all examples of native species that have greatly declined in numbers in recent years, largely due to vanishing habitat.

Any type of green space - no matter how small - can be designed specifically to attract wildlife. There is no ideal garden for wildlife and each garden will attract different species depending on the physical and chemical aspects of the garden as well as the gardens and landscape that surround it. Wildlife gardens can consist of one or several habitats. A habitat in a wildlife garden could be a wood, a pond, a meadow, a bog or a rockery. Within these main habitats, microhabitats can develop, such as a log in a wood that accommodates woodlice and millipedes or a stinging nettle leaf that becomes the host plant of a caterpillar. Thus, wildlife gardens do not have to be large at all., If there is not enough space to have a wildlife garden, it is also possible to act on those smaller areas, such as grassy edges or flower beds. These can be planted with wild flowers to become a meadow, or with herbs and nettles that attract butterflies. All these habitats are still very beneficial to wildlife and are worthy of attention.

Here you are a list of several projects and websites which may offer you important and significant information about this issue, applicable in any context.

Title	Contents	Website URL
The Royal Borough of Kensington and Chelsea - School Wildlife Gardens. A Teacher's Guide	Guide to creating School Wildlife Gardens.	https://www.rbkc.gov.uk/pdf/School%20wildlife%20Gardens%20-%20a%20guide%20for%20teachers.pdf
RHS - Encouraging wildlife in your school garden	School Gardening (activities, lesson plans, projects, information sheets etc.).	https://schoolgardening.rhs.org.uk/resources/info-sheet/encouraging-wildlife-in-your-school-garden
Ecospaces - School garden ideas	Ideas and indications to make the school garden wild.	http://www.eco-spaces.co.uk/school-garden-ideas.html
Simple School Wildlife Garden Guide	Guide to creating School Wildlife Gardens.	https://dnr.maryland.gov/wildlife/Documents/School-Wildlife-Garden-Guide.pdf
National Wildlife Federation – Create a Schoolyards Habitats	Ways to Design, Build, Certify, and Use Wildlife Habitats at School.	https://www.nwf.org/Garden-for-Wildlife/Create/Schoolyards
Benefits of starting a School Garden	Why and how create school gardens.	https://www.pennington.com/all-products/fertilizer/resources/school-gardens-changing-lives-and-communities
Future Schools - Wild Garden	Some information on why and how to create a wild garden at school.	https://futureschoolsedinburgh.com/outdoors-wild-garden/
Growing change – Designing a School Garden	How to create a Biodiversity Garden.	https://greenschoolsireland.org/wp-content/uploads/2016/08/Designing-a-school-garden_Second-Level.pdf

Custom Made	How to create healthier, more diverse ecosystems right in our backyards.	https://www.custommade.com/blog/gardens-gone-wild/
Ecosystem Gardening	How to create a welcoming habitat for wildlife in the garden to attract birds, butterflies, pollinators and other animals.	http://www.ecosystemgardening.com/category/wildlife-garden-2
The Wildlife Garden Project	Information and inspiration to create a small wildlife shelter right at your doorstep.	https://wildlifegardenproject.com/
RSPB – Gardening for wildlife	Guidelines and useful indications for the creation of a wild garden.	https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/
Canadian Wildlife Federation – Gardening for Wildlife	Basics for gardening for wildlife, earth-friendly tips and suggestions.	https://cwf-fcf.org/en/explore/gardening-for-wildlife/
National Wildlife Federation – Create a sustainable garden that helps wildlife	Guidelines and useful indications for the creation of a wild garden.	https://www.nwf.org/Garden-for-Wildlife
London Wildlife Trust – Wildlife Gardening Pack	Wildlife gardening guides.	https://www.wildlondon.org.uk/campaigns/garden-living-london
The Wildlife Trust of South and West Wales - Create a Wildlife Garden	Supports people and teachers or schools who realize the wild garden.	https://www.welshwildlife.org
LIPU – Come avere un giardino pieno di Uccelli selvatici	Realization of Birdgardens, even with the schools.	http://www.lipumilano.it/node/109

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