



Veolia Ecological Management Guide



VEOLIA, CONTRIBUTING TO PRESERVING BIODIVERSITY

All observers of sustainable development are unanimous: the preservation of biodiversity is a major condition for the sustainability of the world. Like the climate with which it interacts, biodiversity is deteriorating at a rate that exceeds the most pessimistic predictions. Scientists all agree that the current rate of extinction of species is 100 to 1,000 times higher than the average rate of extinction since the appearance of life on Earth.

Veolia, as world leader in environmental services and a local stakeholder, has a special responsibility for the preservation of biodiversity.

Our activities interfere with the natural environment; however, their proper functioning is also dependent on nature. Reducing our environmental footprint and that of our customers and creating favorable conditions for the preservation and restoration of biodiversity is part of Veolia's ambition to resource the world. Therefore, the Company takes action:

- By returning to rivers and oceans good quality treated water, by preserving natural resources by recycling waste, by limiting air emissions by optimizing energy consumption and flue gas treatment.
- By ecologically managing areas entrusted to us by installing elements that promote the development of fauna and flora by recreating habitats.

This realization of our collective responsibility is reflected in our priorities for sustainable development. One of the nine Veolia commitments for 2015-2020 is the commitment to conduct an evaluation and implement an action plan in 100% of sites identified as having significant biodiversity issues. Philippe Guitard, Member of Veolia's Executive Committee and Director of the Central Europe Area, has agreed to support this objective and vigorously promote it.

In 2015, our commitment to biodiversity was labeled at the Cop21 by the French Ministry of Ecology and Sustainable Development for all our entities worldwide as part of the implementation of the National Biodiversity Strategy.

This recognition commits us to both developing our internal practices and the cooperation necessary to deploy our actions in the field.

This ecological management guide, produced with the support of the French UICN Committee, has been designed to help you meet this major challenge for the future of humanity.

Pierre Victoria

Vice-President Sustainable Development





BIODIVERSITY AND THE VEOLIA GROUP

Biodiversity is worldwide and its destruction is continuing at an unprecedented rate. Species are disappearing 100 to 1,000 times faster than their natural cycle.

Various forms of biodiversity exist on sites managed by the Veolia Group:

- a wide variety of flora in green spaces which may contain not only ordinary species to be protected, but also others that are more endangered (appearing on the IUCN Red List) or are already of a protected nature;*
- various ecosystems (sensitive or otherwise) such as ponds, woods, streams, meadows, can be found in the operating centres or nearby;*
- fauna taking refuge in the various types of soil-based habitats such as mammals and insects restricted to wooded areas;*
- aquatic wildlife in watercourses, such as fish and invertebrates.*

Biodiversity provides us with services called ecological or ecosystem services. These services enable us to achieve a decent and safe living, good health. Their quality is therefore essential. Furthermore, some of these services are at the core of the Veolia Group activities, such as water treatment, the natural breakdown of substantial waste and pollutants, etc.

A player in the water cycle, waste treatment and energy resource, the Veolia Group is, at the same time, a “generator” of impacts on biodiversity, a “user” of ecosystem services, and a driver in conserving and restoring biodiversity.

Conserving and restoring biodiversity are major issues in which the Veolia Group has undertaken to become involved. With the support of IUCN France, the Veolia Group is intensifying its actions by incorporating biodiversity into the company strategy.

In fact, conserving or improving the ecological quality of the environment enables the Veolia Group to provide high-quality services and to improve its environmental performance. Veolia can contribute to conserving biodiversity and to implementing the Green and Blue Corridor if each of its sites sets up ecological management, while improving or restoring ecological continuity.

ECOLOGICAL MANAGEMENT

Ecological management of natural/green areas is considered a management method which employs a style of upkeep to protect the environment, and which is adapted to the characteristics and implementation of areas. The terms “reasoned management” or “differential management” are also used.

This is a way of managing green areas which consists in not using the same intensity or the same management methods to all areas.

It has three main objectives:

- to rationalise the management of green spaces and the allocation of the resources required,
- to improve the quality of life and the use of the areas by diversifying the landscape qualities,
- to restore, preserve and manage the environment, by limiting artificial elements and pollution, (fertilisers, pesticides and pollution caused by machinery), disturbance and by giving priority to diversifying environments and species as well as by developing ecological services.

Accordingly, this management consists in favouring biodiversity on the Veolia Group’s sites and in developing ecological corridors within these sites, in continuity with the nearby corridors to incorporate them into the territory.



USING THE GUIDE

This Guide, produced under the partnership with IUCN France (International Union for Conservation of Nature), and thanks to feedback from various Veolia sites in France, provides good practices for protecting the environment and contributing to preserving and restoring biodiversity on Veolia sites. It is designed as a medium to help in the ecological management of sites, and to find the appropriate contacts to help solve any problems.

Technical information, bibliographic references, and contacts in associations or local structures are featured, should further information be required.

The pictograms below show the level of difficulty in implementing certain actions. External assistance is recommended if necessary.



Easy / Intermediary / Complex



External assistance unnecessary / External assistance advisable / External assistance required

Regulatory and contractual requirements:

French law on the protection of nature states that it is everyone's duty to protect the natural heritage in which they live (Act No.76-629 of 10 July 1976). In France, biodiversity management is supported by the regulatory requirements, in particular:

- French regulations on Installations Classified for Environmental Protection (ICPE) stipulate that impacts on the natural environments of the classified installations must be assessed, avoided, minimised and, if need be, compensated (Act No.76-663 of 19 July 1976).
- French law on water and the aquatic environments provides penal sanctions for industrial discharges causing damage to the fauna and flora (Act of 30 December 2006).

At European level:

- The European "Birds" Directive [79/409/EEC] adopted by the European Union on 2 April 1979 and the European "Habitats, Fauna, Flora" Directive [92/43/EEC] of 21 May 1992 set up the European Natura 2000 network of ecological sites to be protected. Its objective is to protect the wild fauna and flora's natural habitats by forbidding the destruction of protected species all over Europe.
- "The projects likely to have a notable effect on the Natura 2000 sites must be assessed for their effects and may only be authorised provided that the Natura 2000 network remains consistent."
- Special Protection Areas (SPA) with the Special Areas of Conservation (ZAC).
- The European Directive on environmental awareness stipulates that a study of the impacts should be made including a Fauna/Flora section and that the measures required to prevent and correct damage to the environment be funded (Directive 2004/35/EC, which France transposed into French law by Act No. 2008-757 of 1st August 2008).

The European Directive on the protection of the environment by penal law punishes serious damage to the environment (pollution, destruction of protected habitat, etc.) by fines and prison sentences (2008/99/EC). The contractual elements may also contain requirements on the ecological management of the sites to which we must respond.



**IMPROVING THE MANAGEMENT
OF GREEN SPACES**



**PLANTING AND MAINTAINING TREES,
HEDGES, AND SHRUBS**



**INSTALLING SHELTERS AND BOXES
FAVORABLE TO WILDLIFE**



**ADAPTING BUILDINGS
TO FAVOUR BIODIVERSITY**



**CREATING, MAINTAINING, AND
RESTORING POOLS AND PONDS**



**MAINTAINING THE BANKS
OF RIVERS AND STREAMS**



**LIMITING THE USE OF PLANT
PROTECTION PRODUCTS**



**LIMITING INTERFERENCES
GENERATED BY SITES**



**MANAGING ALIEN
INVASIVE SPECIES**

IMPROVING THE MANAGEMENT OF GREEN SPACES

1. Why implement differentiated management of green spaces?
2. Mow while limiting the impact on biodiversity
3. Convert a lawn into a wildflower meadow
4. Sow a wildflower meadow
5. Leave wasteland
6. Recycle green maintenance waste
7. Education and communication actions

1 WHY IMPLEMENT DIFFERENTIATED MANAGEMENT OF GREEN SPACES?

Most of the green spaces of industrial sites are covered with grassy lawns, regardless of the use of these spaces. Differentiated management involves adapting the management of the different green spaces of a site according to their use. This particularly involves not mowing areas that do not need it. Effectively lawns give a neat impression but its maintenance is time consuming and its ecological interest is very limited. The number of plant species that compose a lawn is low, repeated mowing kills annual plants and does not allow flowering plants to bud, attract insects, go to seed, and naturally reseed. Depending on the use of spaces, other methods exist which reduce maintenance time, provide habitats for wildlife, and develop rich biodiversity.

For each type of space on your site, define the maintenance method to use (several maintenance methods can therefore be used on your site):



Spaces concerned	Possible management method	Type of environment created
Near buildings and along access routes: roads, footpaths	Take certain precautions when mowing to reduce the impact on biodiversity (<i>recommendations in Section 2</i>)	Short grass
Rarely used areas	Stop mowing and cut using another method for a flowery meadow (<i>recommendations in Section 3</i>) Sow a wildflower meadow (<i>recommendations in Section 4</i>)	Wildflower meadow
Rarely used areas	Let vegetation grow (<i>recommendations in Section 5</i>)	Wasteland

2 MOW WHILE LIMITING IMPACT ON BIODIVERSITY



Easy



External assistance not required

Mowing traumatizes biodiversity. However, if you feel that mowing is necessary, some precautions limit its impact:

- Do not mow too short (approx 6-8 cm).
- Do not mow too often (once a month or every two months).
- Never mow the entire surface in one go to maintain wildlife in certain areas.
- Mow a plot in the centre expanding outwards (to allow animals to escape and find shelter elsewhere).
- Prefer a suitable lawn mix (drought resistant to limit watering or slow-growing to limit mowing).
- Do not use fertilizer.



3 CONVERT A LAWN INTO A WILDFLOWER MEADOW



Easy



External assistance not required

- Stop mowing and leave it to grow. A meadow with plant species naturally present on the site will gradually develop.
- Only use the lawn mower to mow pathways through the long grass for people to use if you want the area to be accessible. You can also mow the edges to show that the site is maintained and that the wildflower meadow is a choice.



Meadow maintenance?



Easy



External assistance relevant to find out when to avoid cutting the meadow to avoid impacting wildlife

- Watering and fertilizer is not required.
- Cut without crushing taking certain precautions:
 - Cut once a year after flowering.
 - Cut at 10 cm to limit the impact on the animals living in the meadow.
 - Cut in a spiral (from the centre of the meadow outwards) to allow the wildlife to escape.
 - Remove cuttings after storing them on site for a few days to let the insects move out. The aim is to avoid enriching the soil with the decomposing clippings as poor soil favors greater diversity of wild plants.
 - Respect periods of work (do not work during the nesting period, for example). Contact a local nature conservation association to define the best periods to work on the site based on its conditions.
 - Cut by sections: if possible in two or three times to leave the animals time to move. Leave a different area untouched (not cut) every year to maintain a refuge for animals and small mammals and avoid a sudden shortage of food sources.



You can also maintain the meadow by using grazing animals instead of cutting by machine. For this, enter into a partnership with a local farmer and establish specifications to define the arrangements:

- grazing periods.
- areas to use for grazing.
- number of animals per hectare.
- liability in case of an accident with the farmer.



4 SOW A WILDFLOWER MEADOW



Easy



External assistance not required

Where should a wildflower meadow be sown?

- Do not sow a wildflower meadow in an area that is already rich in



biodiversity. Prefer a lawn or artificialized area.

- Choose an area protected from prevailing wind, trampling, and preferably with good sun exposure.
- Sowing the meadow along linear elements (roads, hedges, or banks) will increase its positive impact on biodiversity by encouraging the diffusion of species over the area.



Which plant species should be sown?

Prefer:

- Local species that are better adapted to the environment and climate and naturally resistant to diseases and pests.
- A diversity of species (mainly honey and nectariferous plants favorable to pollinating insects).
- A mixture of annuals, biennials and perennials to ensure flowering for three years.
- Species with staggered flowering times.



Also avoid introducing invasive alien species.

How to sow?

- Till the soil beforehand: turn it over, decompact it with a rotary harrow or cultivator, remove residues, and level the top with a rake or a hoe fork.
- Weigh the required amount of seed (variable depending on plot size and sowing period), mix the seeds in three times their own volume of clean and dry sand, then sow by hand or using a mechanical seeder if the plot is large.
- Flatten the plot using a roller to ensure that the seed is in contact with the soil.

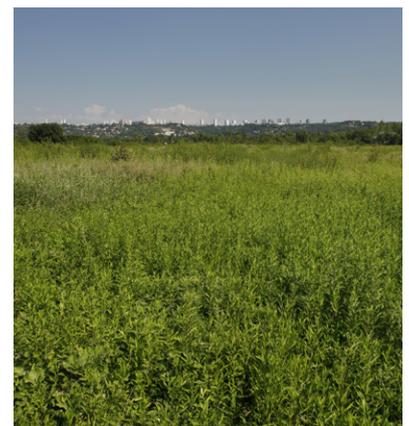


To control planting costs while ensuring quick results, only sow certain plots of the site and leave a natural meadow develop on the other plots.



Meadow maintenance?

Maintain in the same manner as a lawn converted into a meadow (see above).



5 LEAVE WASTELAND



Easy



External assistance not required

Wasteland is originally land that has been either temporarily or permanently abandoned. It is also a space that is rich in plants, insects, and small mammals. Leaving wasteland to develop on an area of the site which is never used can therefore be extremely beneficial for biodiversity. Simply stop maintaining a lawn or meadow and allow it to evolve naturally:

- Cut very rarely (every three years or longer).
- To prevent the environment from closing up as wasteland naturally evolves into woodland, cut woody species growing in the area down.

- Make sure that you remove invasive alien species that might take root in the wasteland (see sheet on Managing invasive alien species).

6 RECYCLE MAINTENANCE WASTE

Waste from the maintenance of green areas (branches, grass clippings, leaves, etc.) can be recycled in two ways:

- As natural mulch on bare soil to prevent the growth of unwanted plants as an alternative to plant protection products (see sheet on Limiting the use of plant protection products).
- As a quality natural fertilizer after composting: spreading compost over the soil not only helps improve soil fertility but also promotes greater diversity of micro-organisms making plants more resistant. All green waste can be composted (cut grass, dead leaves, young branches) but some basic principles need to be respected:
 - install the compost heap in a shady location, out of site.
 - diversify the waste added taking care to mix wet waste (green shoots, grass cuttings) and dry waste (branches, straw), coarse products (crushed branches) with fine products (grass cuttings, sawdust), nitrogen-rich materials (fresh grass cuttings, saplings), and carbon materials (branches, dead leaves). A mixture of one to two parts nitrogenous material and one part carbon material ensures optimum composting conditions.
 - keep compost moist (about 50%: a few drops should bead when you press a handful of compost in your hand)
 - turnover the compost once a month to decompact the heap, air it, and ensure homogeneous decomposition.
 - the full composting process takes 6 to 12 months.



7 EDUCATION AND COMMUNICATION ACTIONS



Easy



External assistance not required

The increase in the height of vegetation and the presence of high dry grass may not be understood by site employees. Therefore, you should explain that the implementation of differentiated management is motivated by environmental reasons and not neglect or budget restrictions, as has been experienced on the sites of some other companies. Information can be provided to employees by installing an explanatory sign in front of spaces with a late cutting season.



Sources

ANVL, *Natureparif*, 2009. *Guide de gestion différenciée à l'usage des collectivités*.

AREHN, 2015. *Reasoned management of green spaces*.

Noé Conservation, Veolia Water. *Action Plan to plant a Jardin de Noé on the WWTP site of Chapelle Saint-Mesmin*.

PLANTING AND MAINTAINING TREES, HEDGES, AND SHRUBS

1. Why plant and maintain trees, hedges, and shrubs?
2. Planting trees, hedges, and shrubs
3. Maintaining trees, hedges, and shrubs

1 WHY PLANT AND MAINTAIN TREES, HEDGES, AND SHRUBS?

Appropriate ecological management of trees, hedges, and shrubs promotes biodiversity as they serve as refuge, feeding, and breeding areas for many species of animals. Moreover, when they are well managed, these environments provide a number of services: they maintain the soil and fight against erosion, they regulate water and air quality, they can protect against the wind, and they can be a valuable visual screen to hide certain buildings or infrastructure on your site.



2 PLANTING TREES, HEDGES, AND SHRUBS

Check whether any legal provisions need to be complied with

Contact the representatives of your country's administration to determine whether planting trees, hedges, and shrubs is subject to certain legal provisions and/or procedures.



For French sites:

Article 671 of the French Civil Code defined the rules to respect regarding planting distances:

Type of vegetation	Minimum distance between plants
Vegetation up to 2m high.	0.5m from the limit of the neighboring property.
Vegetation over 2m high.	2m from the limit of the neighboring property.

What plant species should you choose?

- Do not use invasive alien species (see sheet on Managing Invasive Alien Species) or plant species that have artificially obtained which sometimes poorly withstand local conditions and diseases and produce little or no pollen and nectar.
- Prefer local species: they will be more favorable to the local fauna and flora. They will also require less maintenance as they are better suited to the climate and soil of the region, less susceptible to pests, and will not behave like an invasive plant species. In the current context of climate change, the choice could also involve local drought-resistant species.
- Avoid planting cumbersome trees near building to reduce the constraint of pruning.
- Vary species to increase the ecological interest and limit disease. Also choose trees that grow to different heights (tall, short, shrubs, etc.).



For French sites:

Forest seeds and seedlings may only be purchased from companies that have declared that they carry on an activity in the field of trade in forest reproductive material (FRM) to the Prefect of the region. A list of companies carrying on trade in FRM is available on the Ministry of Agriculture's website:

<http://agriculture.gouv.fr/Presentation-de-la-reglementation>

N.B. When planting an orchard, it might be worthwhile planting heritage varieties. On the one hand, this will safeguard the variety of fruit and, on the other hand, these varieties are generally more resistant to disease. Finally, favor a combination of these varieties for staggered flowering times that will accommodate a more diverse fauna during the flowering periods.

Planting?

 Intermediate  External assistance relevant from a landscape architect

- Prefer planting seeds or seedlings: young plants grow faster.
- Dig a hole that is sufficiently large enough to contain the entire root system of the seedling and plant them taking care to not bend the roots.
- Tamp down the earth with your feet taking care to not cover the collar, the portion between the root system and stem.
- Protect newly planted seedlings to prevent animals from nibbling on them (avoiding the use of non-biodegradable plastic protections).

It is also possible to create a natural hedge without planting by leaving the herbaceous layer to grow into a hedge. For this, leave a two meter wide band uncut in the areas defined for this action (e.g. along fencing, around tree stumps, etc.). These areas will subsequently only need maintenance every two years.



3 MAINTAINING TREES, HEDGES, AND SHRUBS

Check whether any legal provisions need to be complied with

Contact the representatives of your country's administration to determine whether planting trees, hedges, and shrubs is subject to certain legal provisions and/or procedures.

For French sites:

Article 673 of the French Civil Code defines the rules to follow regarding maintenance and pruning obligations:

"One over whose property branches of a neighbor's trees, bushes and shrubs jut out may compel the latter to cut them."

*Fruits which have fallen naturally from these branches belong to him
Where roots, brambles and brushwood jut out on his property, he has the right to cut them himself up to the
limit of the dividing line.*

*The right to cut roots, brambles and brushwood or to have branches of trees, bushes or shrubs cut may not
be lost by prescription."*

However, there are limitations regarding trees that were planted over thirty years ago.

Article L.114-2 of the French Roadway Code defines visibility easement:

"Visibility easements include, as appropriate:

- *The obligation to remove (...) trees blocking the view, level and maintain land and any superstructure at a level at least equal to the level set by the View Clearance Plan provided for in Article L. 114-3*
- *The absolute prohibition (...) to plant any trees and build any installations above the level set by the View Clearance Plan*
- *The right for the road operator to resect slopes, embankments, and all natural obstacles to achieve satisfactory view conditions."*

Article L.322-3 of the French Forest Code defines the rules to follow regarding ground clearance:

"In communities where woods classified under Article L. 321-1 or included in the forest areas mentioned in Article L. 321-6, ground clearance and maintenance in a cleared state are mandatory in areas located less than 200 meters away from woodland, heath land, scrubland, plantations and reforestation plantations (...).

You may also consult the Ministry of Ecology and Sustainable Development, 2003. Les Droits de l'arbre - Aide mémoires des textes juridiques. Collection of legal instruments intended to help understand legal texts".

Pruning trees?

Individual trees that are in good health do not need to be pruned. However, if you want to control the tree's volume or height, here are a few rules to follow:

- Prune in dry conditions during the tree's dormant period to maintain maximum reserves for the tree to recover.
- Avoid wildlife breeding periods. However, should a tree need to be pruned during the breeding period check that it does not contain any nests beforehand (see sheet on Preserving and diversifying wildlife habitats).
- Disinfect pruning tools beforehand.
- Only cut branches that are less than 5 cm in diameter.
- Cut the branches growing towards buildings or the centre of the tree as well as broken or diseased branches.
- Avoid damaging neighboring branches and the trunk.
- Protect scars with pine tar* or cut paste, for example.
- Take the diseased wood to a waste drop off centre or burn it.
- Crush healthy branches that have been pruned for recycling into mulch laid at the base of your trees, hedges, or elsewhere. However, it is recommended to leave a few branches in a heap on the ground to create refuges for wildlife. They will naturally degrade.
- Select the new branches that will grow around the wound in the spring and will become new branches. Cut the others off.



**Also called Stockholm tar, wood tar, or liquid pitch. It is a natural plant product obtained from pine carbonisation and distillation.*

How to maintain and prune a hedge?



Intermediate



External assistance relevant from a landscape architect

- Only water a hedge after you have planted it and do not use plant protection products on it.
- Spread mulch under the hedge to limit the evaporation of moisture.
- Prune the sides and top (if need be) at regular intervals (depending on the type of hedge).
- Avoid pruning the top of the hedge because it can result in a gradual disappearance of the hedge by creating discontinuities and it also results in the destruction of shelter used by many animals.
- Also avoid pruning the sides of hedges too high up to keep a crown favorable for birds.



N.B. Crushers (or tractor mowers) or hedge trimmers should only be used to cut the year's growth (non-lignified) otherwise they will shred woody branches and cause health disorders and increasing the risk of spreading diseases.

What should you do with old and dead trees with cavities?



Easy



External assistance not required

It is important for biodiversity to keep old and dead trees with cavities as these are used as habitats by a wide number of organisms.

- Old trees or dead wood are home to fungi, moss, ferns, and lichen. Fungi will perform the first stage in recycling and detritivorous species will eat the dead wood. The larvae of many insects, mainly beetles, bore into the wood and others build their nests in unoccupied galleries like some solitary bees which are excellent pollinators.
- Cavity nesting species, such as woodpeckers, owls and some bats, use the cavities of these dead trees to breed or shelter in during the winter, for example. Squirrels and genets nest in them. Therefore, thousands of species are dependent on dead trees.
- Keeping dead trees standing and leaving stumps to rot in the ground promotes life underground and adds organic matter.



When should you cut down a tree?

The tree must need to be cut down. Apart from economic considerations, there are two cases where it can take place.

- For safety reasons: a tree must be cut down to avoid the risk of accidents or the spread of disease. The owner or operator is liable for safety aspects. In most cases, only part of the tree is dangerous and therefore only that part needs to be cut down in order to extend the tree's life.
- To remove invasive alien species (see sheet on Fighting against Invasive Alien Species).



How to cut down a tree to promote biodiversity?

 Intermediate  External assistance relevant from a landscape architect

If a tree needs to be cut down, it is still possible to act in favor of biodiversity and especially insects with feed on rotting wood. For this:

- Keep high stumps of about 50 cm or more to maintain a natural environment conducive to the development of certain fungi and rare insects necessary for the ecological balance of the site. This also saves the cost of grubbing.
- Cover stumps with pruned branches and sawdust. They will keep the stump moist and provide a favorable environment for insects, such as stag beetles, and reptiles.
- Leave wood with no commercial value.
- Put up substitute nesting boxes (birds and bats) after cutting down hollow trees (see sheet on Making Adaptations Favoring the Development of Biodiversity).



Sources

AEV, Conseil général du Val de Marne, 2008. *Guide des bonnes pratiques pour la protection et la gestion des lisières en milieu urbanisé.*

ANVL, Natureparif, 2009. *Guide de gestion différenciée à l'usage des collectivités*

Centre régional de la propriété forestière normande. *Les lisières forestières.*

Conservatoire Rhône-Alpes des Espaces naturels, 2010. *Bois et forêts à arbres vieux ou morts. Les cahiers techniques.*

CRFP Lorraine Alsace, ONF, Groupement des sylviculteurs et SRFB, 2007. *Biodiversité et gestion forestière.*

Institut d'aménagement et d'urbanisme de la région d'Ile-de-France, 2005. *Le vieux bois, élément essentiel de la biodiversité Forestière. Note rapide sur l'environnement, octobre 2005.*

ONF, 2010-1. *Biodiversité. Les arbres à conserver pour la biodiversité Comment les identifier et les désigner ?*

ONF, 2010-2. *La gestion durable des forêts publiques... Produire plus de bois, tout en préservant mieux la biodiversité...en forêt domaniale.*

Parc naturel régional des Boucles de la Seine normande, 2005. *Les arbres têtards. Intérêt, rôle et guide d'entretien.*

Persuy A., 2011. *Guide des arbres et arbustes de France, éditions Belin.*

A close-up photograph of several bees on a honeycomb. The honeycomb is made of golden-brown wax and has a grid of circular cells. Some cells are filled with honey, while others are empty. The bees are of various species, with some showing distinct black and yellow stripes. The background is a soft, out-of-focus green, suggesting an outdoor setting.

*Installing shelters
and boxes favorable
to wildlife*

INSTALLING SHELTERS AND BOXES FAVORABLE TO WILDLIFE

1. Putting up nesting boxes
2. Installing insect shelters
3. Installing beehives
4. Installing bat houses
5. Installing a pile of dry stones

1 PUTTING UP NESTING BOXES

Why put up a nesting box?

The number of environments ideal for bird nesting is dropping due to the abandonment of old orchards, loss of natural grasslands, grubbing up of hedges and groves, felling individual and old trees, and the demolition or renovation of old buildings.

Installing one or more nesting boxes on your site is an easy way to create an effective alternative habitat for birds and this simple action can maintain a species.

What type of nesting box should you install?

Each species of bird has its own requirements and habits. Therefore, there are various types of nesting box. Take advice from your employees who have knowledge on birds or a local nature conservation structure about what species of birds live on your site to choose suitable nesting boxes.

However, there are a few general recommendations:

- Use moisture resistant wood (e.g. pine and poplar). Do not use of chipboard, plywood, or treated wood that may be harmful to birds.
- Choose thick planks (over 1 cm; ideal thickness: about 2 cm).
- The outer surfaces should be kept rough and natural to allow chicks to get a grip making it easier to reach the entrance hole. If planks are smooth, you can nail a piece of wood under the entrance hole.
- Respect the dimensions of the entrance hole which correspond to the size of the species it is intended for.
- Do not make a nesting box too big as it will not retain the heat.
- Create an aeration system by drilling a few holes in the bottom of the nesting box.
- Create an opening system (side or top) to clean the inside of the box. However, make sure that strong winds will not open the nesting box.
- Protect the nesting box by applying linseed oil or beeswax on the outside surfaces.

How to observe and maintain a nesting box?

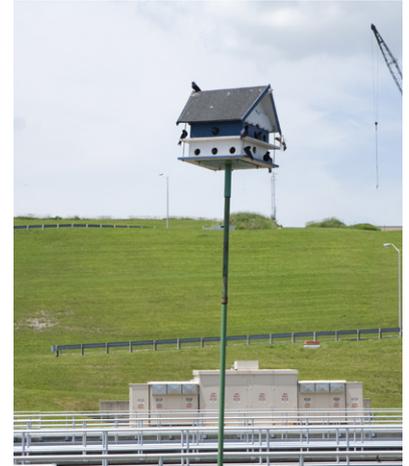


Intermediate



External assistance relevant, in particular, that of an ornithologist to determine what type of nesting box to use based on the species living on the site and surrounding areas.

- Do not open the nesting box; observe it with binoculars.
- At the end of the nesting season, empty and clean the nesting box using a wire brush (to avoid the risk of disease and parasite infestation).



2 INSTALLING INSECT SHELTERS

Why install insect shelters?

Insects have many roles in nature: pollination, soil fertilization, plant recycling, etc. Insects need shelters to take refuge in or to breed. In addition to maintaining places that already harbor insects (whether small: woodpile, sand, etc. or large: meadow full of honey plants) shelters can be installed to encourage the development of various species.

It is recommended to install several different types of shelter in different environments to promote different species.



Type of shelter	For which species	How to build the shelter
Bundle of hollow stems	Solitary caulicolous bees (Bees which do not produce honey and are therefore not aggressive with humans as they do not have a honey store to protect)	Assemble hollow stalks (bamboo, reeds) of varying diameters (1 to 10-12 mm). One of the two extremities of the stalk should be sealed: cut the stalk after a node or seal the opening with clay. Stalk length: 15 cm Installation: place horizontally on a stake or attached to a branch.
Bundle of pithy stalks	Rubicolous species (nesting in pithy stalks)	Construction identical to the bundle of hollow stalks except using pithy stalks: bramble, elderberry, buddleia, raspberry, etc. Installation: place vertically or obliquely on a stake or attached to a branch.
Log of wood with holes	Solitary xylicolous bees (nesting in wood)	A block or log of wood (hard wood such as untreated beech, oak, or black locust). Drill holes with different diameters (2 - 10 mm) and of varying depths (5 - 15 cm), spaced at least 2 cm apart. Installation: attach to a stake, on a stone wall, or hang from a tree between at height of 50 cm and 3 m. Facing south, south-east.

Ladybird shelter	Ladybirds	Stack a series of wooden planks approximately 20 x 15 cm spaced 5 mm apart. Cover with a waterproof roof (slate or waterproof canvas).
Flowerpot	Forficule (earwig)	10-15 cm diameter flowerpots filled with plant fibers (straw or hay stored in a net). Installation: attach the pot to a string and hang from a tree branch.

Other possible types of shelter:

- Small piles of dead wood which insects can eat.
- Piles of dead leaves which will attract beetles.
- Piles of sand in a sunny area in which soil inhabiting insects will dig their nests.
- A box with holes drilled in it filled with straw for lacewings.

Where should these shelters be installed?

Install shelters near to a food source (flowers, hedges, orchards), in a sunny area, preferably protected from the wind and rain.

Shelter maintenance?



Easy



External assistance not required

No maintenance is required. Replace the shelter when it becomes too damaged. Replace the dead wood or dead leaves when they have decomposed.



3 INSTALLING BEEHIVES

Why install beehives?

Firstly, for the honey: a beehive produces between 10 and 20 kg of honey a year (N.B. you cannot harvest the honey the first year as it will be used as a food reserve by the bees).

Next, many bee species are endangered (approximately 10% of European wild bee species are endangered according to the IUCN methodology). Installing a beehive therefore contributes to the preservation of biodiversity. In addition, bees are partly responsible for pollination. The flora on your site and the surrounding environment will directly benefit from the presence

of a beehive in activity.

Finally, bees are a reliable bio-indicator of the status of your site's environment (within a radius of 2 - 3 km). They effectively indicate the chemical degradation of the environment by a higher or lower mortality rate and residues found on the bodies of bees or the beehive's products.

What needs to be done before installing a beehive?

- Check whether any legal provisions need to be complied with.

Contact the representatives of your country's administration to determine whether installing a bee hive is subject to certain legal provisions and/or procedures.



For French sites:

Before installing a beehive, the owner of the premises must be formally informed of this along with employee representative bodies (WHSC, etc.). An appropriate first aid kit should also be purchased.

Bee-keepers must declare their beehives every year as of the first year of activity. For more information go to the French governmental website: <http://vosdroits.service-public.fr/professionnels-entreprises/F24392.xhtml>

A minimum distance must be maintained between beehives and neighboring properties and public roads. This distance is set by Decree by Prefects or, failing that, by Mayors (Articles L.211-6 and L.211-7 of the French Rural Code). No minimum distance may be required for beehives that are isolated from neighboring properties or public roads by a wall, a wooden fence in joined planks, or a hedge when at least 2 m in height and extending the location of the beehive(s) by two meters on either side.

It is recommended to take out specific insurance policies and report your beehives to the veterinary services every year (they will assign you a registration number that must be clearly shown on each beehive in figures of 3 cm in height).

A breeding register must be maintained and any suspicion or appearance of a disease that is contagious for bees must be reported to the local Population Protection Department which is a sub-department of the French Veterinary Services.

Contact a bee-keeper to confirm the interest of installing a beehive on your site and, if applicable, for guidance in your selection and the provision of precautions and recommendations to follow.

Where should a beehive be installed?

- A beehive can be installed on an urban site (respecting appropriate safety standards) if honey plants* are present nearby.
- Turn the beehive's entrance south / south-east, in a place protected from drafts and prevailing winds (e.g. in a place sheltered by a hedge).
- Clear the area around the beehive (about one meter) to facilitate bee take-off.
- Ensure that the beehive is as stable as possible and slightly tilting forward.
- Keep the beehive off the ground with metal supports, stones, or rubble stone.



- Install several beehives (3 - 5), instead of just one per site, to optimize the bee-keeper's visit to the site in terms of quantity. A small apiary will contain three to five beehives installed in the spring.

Beehive maintenance?

It is recommended to outsource maintenance to a bee-keeper.

Beehives require close monitoring and regular maintenance during the year:

- Monitoring of the health status of colonies and the installation of new bees if some colonies have died.
- up to the first honey harvests, ensure the proper development of the colony and install honey supers when surplus honey begins to be produced.



**Honey plants : produce nectar which is a very sweet liquid that is collected by pollinating insects.*

Harvesting honey?



Intermediate



External assistance required from a bee-keeper to maintain beehives and harvest the honey.

It is recommended to outsource maintenance to a bee-keeper. Honey is harvested in several stages:

- honey supers are removed from the colonies
- the frames are uncapped as a thin layer of wax covers the cells filled with honey
- the combs are placed in a centrifuge to extract the honey
- supers are then put back in the beehive to be refilled with honey by the bees
- the honey obtained is prepared, by filtering to remove all impurity, and then left to mature for a few days at a temperature of 20°C
- after skimming, the remaining honey is put into pots. It can be kept for about two years
- a laboratory should test the honey to verify that it can be eaten. Analyses also determine under what label the honey can be marketed (flower honey, acacia honey, etc.).



4 INSTALLING BAT HOUSES

Why install bat houses?

Bats (Chiroptera) are a discrete species that live at night. Their populations are threatened by the disappearance of natural habitats (felling of old trees) and renovation of artificial habitats (e.g. loft insulation), the disappearance or degradation of hunting grounds, and sources of direct mortality (e.g. wind turbines).

What bat house should you choose?

Bat houses are generally flat boxes with an entrance underneath. It



provides additional shelter to individuals, allowing them to rest mainly during summer days and even hibernate or breed.

- Materials and thicknesses are identical to those for bird nesting boxes.
- Identify which species live on the site and the type of house to install with an expert.
- A bat house composed of several rooms (photo opposite) will provide its guests with the possibility of choosing the ideal place based on the temperature inside the box.
- Horizontal grooves are needed inside to allow bats to cling to the sides easily.
- Walnut stain can be used on the outside. The bat house will absorb the heat better if in a dark color.



Installing a bat house?



Intermediate



External assistance relevant.

Preferably on a building or against a tree trunk on the edge of a forest (tree to protect).

- Choose a clear and sunny location (south, south-east) away from the wind or slightly shaded in warmer areas. If possible near a calm body of water.
- Protect it against the rain and check that it is sealed (bats do not like drafts).
- The approach area must be unobstructed.
- Install the bat house at a height of between 3 and 6 meters.



Additional action: keep elements favorable to bats that are already on-site:

- Keep old trees with cavities which bats use for shelter.
- Maintain hedgerows which are genuine hunting and flying corridors.
- Maintain bodies of water and cut meadows which are hunting areas that are very popular due to the abundance and diversity of the insects present.
- If bats have taken up residence in trees that need to be cut down, perform this work outside their reproduction and hibernation periods (contact nature conservation specialists to identify them).
- Limit night lighting and prefer lighting towards the ground (see sheet on Limiting pollution generated by a site).



5 INSTALLING A PILE OF DRY STONES

Why install a pile of dry stones?

The gaps and cavities provide refuges for many small animals: insects will appreciate the warmth and the cavities required for hunting and reproduction and reptiles will move in for a sun bath while amphibians will find refuge. Certain plants, adapted to extreme conditions, will also

grow on the pile.

How to install a pile of dry stones?



External assistance not required.

Pile up differently shaped and sized stones. The biggest stones should be placed at the bottom on the pile for stability:

- Location: select a flat and sunny area.
- Maintenance: Clear away vegetation every two years in the winter using a backpack brush cutter.



Sources

Fabriquer des nichoirs pour les oiseaux, section namuroise des Cercles des naturalistes de Belgique.

ADAPTING BUILDINGS TO FAVOUR BIODIVERSITY

1. Why adapt buildings to favor biodiversity?
2. Make adaptations favoring the development of biodiversity
3. Keep old walls and stone walls
4. Prevent animals from getting trapped
5. Green roofs
6. Vegetate walls and façades

1 WHY ADAPT BUILDINGS TO FAVOR BIODIVERSITY?

Biodiversity has its place among buildings which can favor its development. Many species find the characteristics of their natural environment in some buildings. Walls, gables, and eaves provide wildlife with numerous places to settle and develop. Birds can nest in them and bats find somewhere to hibernate or live in the eaves.

Old buildings are especially of interest for biodiversity and should therefore be kept. It is also possible to integrate biodiversity preservation into new buildings.



2 MAKE ADAPTATIONS FAVORING THE DEVELOPMENT OF BIODIVERSITY

Buildings can be a support for nesting boxes, bee hives (on the roof), or bat houses (see sheet on Making small adaptations and installing shelters for wildlife).



3 KEEP OLD WALLS AND STONE WALLS



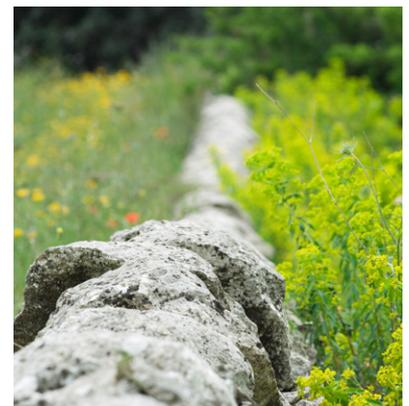
Easy



External assistance not required

Old walls are a major support for biodiversity as a large number of birds use the recesses to build nests in. They can also shelter wildlife and flora which thrive in stony habitats: lizards, frogs, rock plants, etc. These species are generally fragile because they depend on a very specific environment.

If your site has an old wall or stone wall, it may be worthwhile to keep it for biodiversity and not knock it down unless absolutely necessary.



4 PREVENT ANIMALS FROM GETTING TRAPPED



Easy



External assistance not required

Buildings have many opportunities for wildlife but they can also be fatal for many animals. Simple steps can be taken to avoid this:

- Cover chimney flues and hollow fence posts with bars or fencing to prevent birds from falling down them.
- use bird anti collision stickers on windows to prevent birds from flying into windows and bay windows.



5 GREEN ROOFS



Complex



External assistance necessary

Modern buildings are often sterile areas that are not conducive to sheltering wildlife. Vegetating roofs and façades helps create good shelter conditions for biodiversity by providing resting and nesting areas as well as food sources.

Green roofing involves laying a vegetated substrate on the roof. There are different types of green roofs depending on the thickness of the substrate and thus of the vegetation which might grow on it.

Extensive green roofs: these are roofs with a thin layer of substrate. This is the most common system as it requires little maintenance (watering is not required after planting) but it has the least ecological interest.

Semi-extensive green roofs: vegetation can grow up to 30 cm high and include shrubs on a substrate of intermediate thickness. Watering is required and therefore there is more green waste as the vegetation is more imposing. Shrubs may need to be pruned.

Intensive green roofs: they look like real hanging gardens. Unlike other techniques, intensive green roofs can accommodate denser vegetation including trees. This technique has heavy installation constraints due to the extra weight and additional costs.

Biodiversity can be encouraged to develop on a green roof through certain actions:

- Implement areas with different water content and wind exposure.
- Lay substrates with different sizes and weights.
- Install dead wood, rocks, and other natural elements.
- Plant naturally or low draining vegetation.
- Build mounds and micro relief to create different depths.
- Provide shady areas and areas with different sun exposure levels.

All green roofs are of interest for biodiversity because they allow an ecosystem that is more complex than that commonly found on a roof to develop. Substrate can be used for nesting and vegetation can be a pollen or nectar resource and provide shelter for many insects.



6 VEGETATE WALLS AND FAÇADES

Implement a vegetated façade



Intermediate



External assistance relevant

Vegetated façades are planted with climbing plants that support themselves or stuck to the wall via a support system.

Different plant species can be used:

- woody plants who support themselves by growing against the wall
- climbing plants which need a support
- climbing plants with their own fixing systems.

Wood, cables, wire, plastic, fiberglass, or ropes, climbing plant support structures are varied and fixing and bearing systems are numerous and tailored to the plants and ensure correct distribution of weight.

Plant a living wall



Complex



External assistance necessary

A living wall is a wall built parallel to the building's wall which may be covered by a plant bearing or support system, watering system, and the plants themselves. There are three types of living wall:

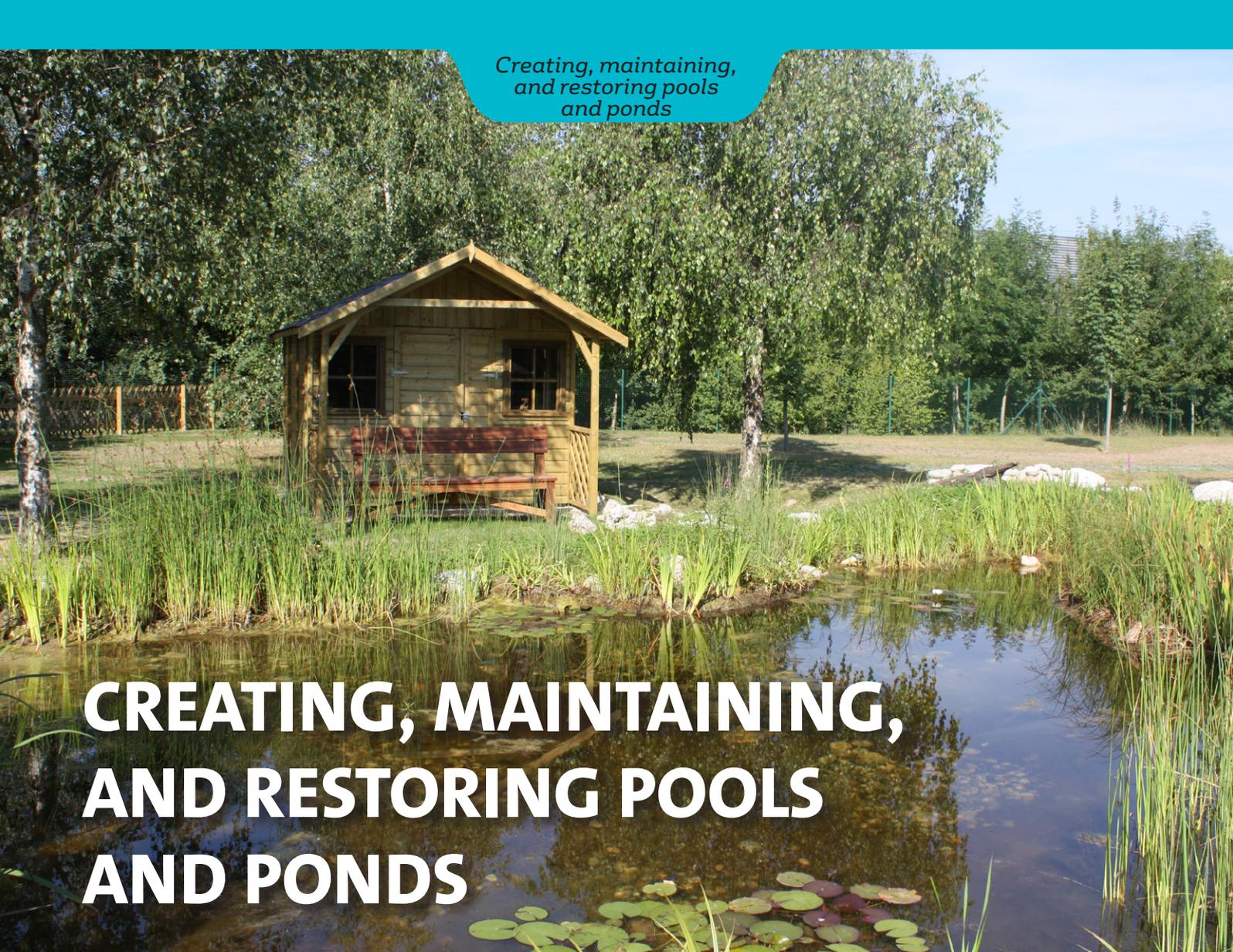
- tailor-made vegetation.
- modular vegetation.
- vegetation to plant.



Sources

Civam, Farre, FNAB, LPO, 2009. *Biodiversité et patrimoine bâti. Fiche technique.*

LPO/CAUE Isère, 2012. *Biodiversité et bâti. Comment concilier nature et habitat ? Guide technique. Grenoble. 20p*



CREATING, MAINTAINING, AND RESTORING POOLS AND PONDS

1. Why create a pond?
2. Check whether any legal provisions need to be complied with
3. Digging a pond
4. Pond maintenance
5. Restoring a pool or pond

1 WHY CREATE A POND?

Ponds are important habitats for many plant and animal species and a breeding ground for many species with declining populations (especially dragonflies and frogs). Creating a pond, even a small one, is therefore an important action for aquatic and amphibian biodiversity as it provides them with biodiversity islands in heavily modified areas.



2 CHECK WHETHER ANY LEGAL PROVISIONS NEED TO BE COMPLIED WITH

Contact the representatives of your country's administration to determine whether creating a pond is subject to certain legal provisions and/or procedures.



For French sites:

Work to create a pond is not subject to a building permit. However, pond creation can be limited or not authorized by SAGES (Water Development and Management Plan) Check the SAGE for your site. Search for a SAGE on the Eaufrance portal's database: <http://www.gesteau.eaufrance.fr/rechercher/sage>

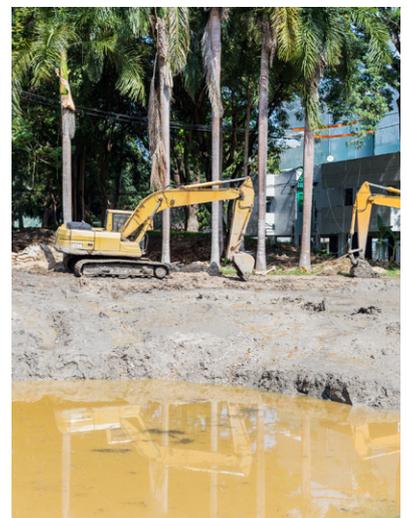
What is the purpose of a SAGE? The SAGE sets general objectives of use and development as well as quantitative and qualitative protection of water in a sub-watershed. The SAGE includes a Management Plan for Water Resources and Aquatic Environments (PAGD) defining the performance conditions for the objectives mentioned above and rules.

Ensure the safety of people in your pond's environment and make sure that it is not freely accessible from the road. You could be held liable in the event of an accident.

3 DIGGING A POND

Where should a pond be dug?

- In a sunny area away from trees (to avoid the accumulation of dead leaves and needles in the water which causes acidification).
- In a low point of land or an existing depression (rain water will naturally run into it).
- At the boundary of your site, not far from an area conducive to biodiversity, such as near a hedge (see sheet on Planting and maintaining trees, hedges, and shrubs) or an unmown area (see sheet on Implementing differentiated management of green spaces) rather than in the middle of a lawn.
- Avoid digging the pond on a slope that is too steep.



- Avoid digging a pond near a road separating it from another pond (the mortality rate of amphibians trying to cross the road to reach the other pond will be high).
- Choose a location where natural soil conditions are most favorable to limit the artificialization of soils: rather compact and relatively impervious soil (e.g. clay or marl).
- Avoid digging the pond over underground rock layers if they are loose, porous, or cracked, otherwise use a geomembrane (follow the instructions below).



How do I find out if I have a clayey soil?

Moisten a soil sample and crush it between your fingers. If the soil sticks to your fingers like chewing gum, it is clay.

If it crumbles, it does not contain much clay and the ground is not waterproof.

Digging a pond?



Easy



External assistance not required

- Prefer a rounded shape (avoid rectilinear forms with angles).
- Plan a surface area of between 3 and 20 m² (the site's biological value will increase with the pond's surface area). Over 20 m², major earthworks will be required to dig the pond which can be problematic and costly but it leaves you with more freedom as to the form that you want to give it.



For French sites:

Note that a body of water of over 1,000 m² must be declared to the Water Police and should include a regulatory act.

- The pond should have a minimum depth of 70-80 cm.
- Do not make the pond more than two meters deep and include gentle slopes and at least two levels: the first level, no more than one meter deep, will keep water at a temperature between 4 and 15°C. This system will improve the pond's safety and increase biodiversity as each level will attract different fauna and flora.
- Lay a waterproof coating on the bottom of the pond if the land is permeable.
- Remove stones at the bottom of the pond and spread a layer of sand over the bottom before waterproofing the pond. Natural materials, such as clay (e.g. bentonite) should be used. A tarpaulin or a geomembrane can also be used. Rigid pre-formed or concrete structures, which are less favorable to biodiversity and more costly, should not be used.
- Fill the pond with rainwater.
- Plan and include a water run-off system in case of overflow (which can erode the banks if the pond is on a slope).



Populating the pond?

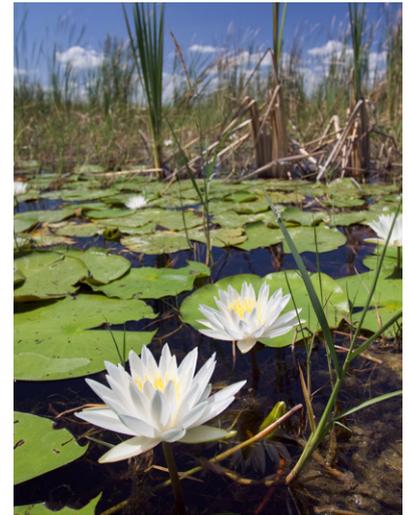


Easy



External assistance relevant from a horticulturist or landscaper to select suitable plants if you choose to buy plants in

- There are two methods:
 1. Do nothing and let plants gradually develop in a freshly dug pond (seeds will be transported by the wind).
 2. Plant and sow native plant species to accelerate the population process.
 - Choose species belonging to different ecological categories: marshland, semi-submerged, floating or with floating leaves, and submerged (1-2 species per category). Check that the plants supplied are the species ordered as errors in the name can lead to the introduction of Invasive Alien Species (e.g. two species of Water Milfoil are IAS).



For French sites:

The tables below contain an indicative list of plants: other native species among the different types can also be planted in the pond. It is recommended that you contact the local fishing and aquatic environment protection association for the name of a horticulturist or landscaper authorized to grow and sell local plants.

- Marshland plants *Myosotis (Myosotis scorpioides)*
 - Myosotis (Myosotis scorpioides)*
 - Mint (Mentha aquatica)*
 - Loosestrife (Lysimachia vulgaris)*
 - March Marigold (Caltha palustris)*
 - Meadowsweet (Filipendula ulmaria)*
 - Rush (Juncus effusus)*
 - Lesser Pond-sedge (Carex acutiformis)*
- Semi-submerged plants
 - Reed (Phragmites australis)*
 - Bulrush (Typha angustifolia)*
 - Yellow iris (Iris pseudacorus)*
 - Water plantain Alisma (plantago-aquatica)*
 - Simplestem Bur-reed (Sparganium erectum)*
- Floating plants or pants with floating leaves
 - Duckweed (Lemna minor)*
 - Yellow Pond Lily (Nuphar lutea)*
 - Water Crowfoot (Ranunculus aquatilis)*
 - Broad leaved pondweed (Potamogeton natans)*
- Submerged plants
 - Spiked Milfoil (Myriophyllum spicatum)*
 - Water-starwort (Callitriche palustris)*
 - Hornwort (Ceratophyllum demersum)*



- Fauna:

- Do not introduce fish that could compete with other animal species.
- The pond's colonization by invertebrate fauna can occur through the arrival of flying insects or the transportation of insects by various mechanisms (especially birds). However, the process can be accelerated by pouring in a few buckets of mud from another wet environment nearby. Amphibians (frogs, newts, etc.) can also move in if other similar wet environments exist nearby.



4 POND MAINTENANCE



Easy



External assistance not required

Regular light maintenance will generally keep the pond in good condition.

1. Do not mow the grass next to a pond too frequently to avoid the cuttings from accumulating in the water. Ideally, a band a few meters wide around the pond should only be cut once or twice a year.
2. Compensate for too high evaporation in the event of severe drought with a progressive supply of water (the pond will experience normal evaporation in summer).
3. Limit the development of species that begin to cover the entire surface of the pond by gradually removing surplus submerged and floating plants in the fall to protect the pond's wildlife.
4. Check that there are no Invasive Alien Species (flora and fauna) present to avoid the deterioration of the pond's ecological interest.
5. Carefully monitor the development of species and do not hesitate to intervene if a species develops at the expense of others.
6. Ban the use of plant protection products within a radius of 800 meters around the pond (or more if the land is sloping).

The pond's equilibrium can be affected. Simple remedies, applicable in temperate regions, can restore it:

Type	Aspect	Causes	Remedies
Proliferation of bacteria	Cloudy water	Too much organic matter Lack of oxygen following an ecological disaster	Remove the mud Fill with fresh water Wait for oxygenating plants to act
Duckweed	Uniform green film on the water's surface	Water containing too many nutrients	Regularly remove the duckweed with a dip net or screen Wait until food stocks fall

Mosquito invasion		Young pond: it does not have any mosquito larvae predators yet Water rich in nutrients	Wait until an equilibrium is found
Proliferation of algae	Thick tangle of strings of algae around other aquatic plants	Water containing too many nutrients Bottom of the pond rich in humus Water very exposed to sunlight	Remove debris from the bottom Remove the tangles of strings of algae Prefer a natural plant cover for the pond using floating aquatic plants that will limit exposure to sunlight

Taken from: *Réserves naturelles et ornithologiques de Belgique, 1991. Refuges naturels (La ville côté jardin)*, Editions Réserves naturelles – RNOB.

5 RESTORING A POOL OR POND

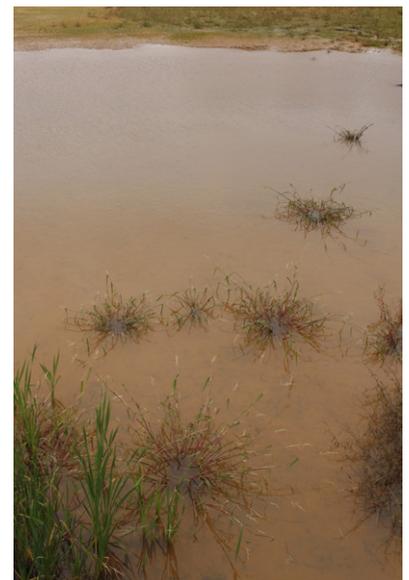
Symptoms of a deteriorated body of water

- Invasion of the circumference and even free water by trees.
- Colonization of the body of water and the tops of the banks by poorly diversified plants.
- Collapsed banks.
- Heavily silted body of water (mud banks visible).
- Body of water mostly dried out, cracked mud.
- Black, greenish, or cloudy water releasing bad odors.
- Body of water partially or completely filled in.
- Presence of a lot of waste.
- Absence of amphibians, fish mortality rate.

If a body of water is shaded most of the day, cut down and grub up the roots of trees casting too much shade. Shade effectively compromises the development of aquatic plants which oxygenate the water and the dead leaves accumulated in the pond use up the little oxygen present in a stagnant water source when rotting, etc.

However, alternating shady and sunny areas is not a problem for a large body of water (over 1,000 m²).

- Plant new trees at a sufficient distance from the body of water, if need be.
- Reshape the banks if they have collapsed (water seeps into the



surrounding lands, materials collapse clogging the body of water). There are several possibilities.

- Re-contour the bank by pushing the top back to soften the slope.
- Secure the bank with a wattle fence (a line of wooden stakes on which plants of wood are fixed and behind which sealing will be performed).
- Compact the bank by adding clay to it.
- Clean out the water if it is silted up. This involves removing the volume of mud either by hand if the body of water is small or using mechanical techniques (vacuuming, shoveling) for larger areas.
- If the provider performing cleaning wishes to dry out the body of water first to facilitate the operation, it is important to recover the aquatic animals and place them in another pond.
- Cleaning without prior drying out of the body of water can also be disruptive for aquatic animals due to mud suspended in the water. To mitigate the effects of this, it is recommended to treat the pond by portion over several consecutive years.



Sources

Agence régionale de l'environnement de Haute-Normandie, 1998. Créer une mare. Disponible sur : <http://www.arehn.asso.fr/publications/cpa/cpa05.pdf>

AREHN, 2004. Restaurer une mare. Connaître pour agir.

Les Amis de la terre, 2004. Mise en œuvre d'une mare naturelle. Disponible sur : http://www.amisdelaterre.be/IMG/pdf/Mare_1.pdf

Ministère de la région Wallone -Direction générale des ressources naturelles et environnement. Créer une mare naturelle dans son jardin ! Disponible sur : http://environnement.wallonie.be/publi/education/creer_mare.pdf

Union régionale des CPIE de Franche-Comté, 2008. Créer, aménager et entretenir une mare dans votre jardin. Disponible sur : <http://www.mares-franche-comte.org/zfiles/91.pdf>

MAINTAINING THE BANKS OF RIVERS AND STREAMS

1. Why maintain the banks of rivers and streams?
2. Check whether any legal provisions need to be complied with
3. What action should be taken

1 WHY MAINTAIN THE BANKS OF RIVERS AND STREAMS?

Regular management of vegetation bordering a river or stream (called riparian vegetation) has a number of interests.

- Physical interest: prevent the accumulation of natural materials deposited by the water (rocks, leaves, driftwood, etc.) to ensure the optimal flow of water in the bed and stabilize banks, particularly during flooding.
- Ecological interests: banks are transition zones between aquatic and land environments where biodiversity can be extremely rich if they are in a good state of conservation.



2 CHECK WHETHER ANY LEGAL PROVISIONS NEED TO BE COMPLIED WITH

Contact the representatives of your country's administration to determine whether maintaining banks on your site is subject to certain legal provisions and/or procedures.

For French sites:

Beds of non-state-owned rivers and streams belong to the riparian owners who are required to provide regular maintenance of them (Article L.215-14 of the French Environmental Code).

Need for a declaration or administrative authorization

If works are part of regular maintenance, there is no need for a declaration or authorization. This type of maintenance must be performed by the riparian owner.

If work involves extracting sediments which is not performed by the riparian owner or not performed as part of regular maintenance, the company conducting the work is subject to a declaration or authorization procedure based on the volume of sediment extracted and the heavy metal concentration of it (section 3.2.1.0. of Article R. 214-1 of the French Environmental Code).

Definition of regular maintenance

«Regular maintenance is intended to maintain the river or stream in equilibrium, ensure the natural flow of water, and contribute to its good ecological status or, where applicable, its good ecological potential, in particular by removing blockages, debris, and alluvium, floating or not, by pruning or cutting back vegetation from the banks.»

(Article L. 215-14 of the French Environmental Code).

It is also possible to contact the local Onema department* to determine the administrative procedure to which the project is subject, if any.

* <http://www.onema.fr/Services-departementaux>

Do not confuse maintenance and correction

Maintenance should never touch the longitudinal route or bank profile. If the profiles across or along the river or stream are changed by the work, then

it is subject to a declaration or authorization procedure (Section 3.121.0. of Article R. 214-1 of the French Environmental Code).

Do not destroy spawning grounds

The destruction of spawning grounds (place of reproduction of fish, amphibians, and shellfish) is heavily sanctioned under Article L. 432-3 of the French Environmental Code (€20,000 fine).

There is an authorization or declaration procedure for works that will destroy spawning grounds (depending on their size) (Section 3.1.5.0 of Article R. 214-1 of the French Environmental Code).



3 WHAT ACTION SHOULD BE TAKEN

Only take action if it is really required

Work on river or stream banks or beds must not be systematic. Action should only be taken when the equilibrium and natural functioning of the river or stream is affected by excessive interference (erosion, silting, etc.).

- Do not cut down a well rooted tree hanging over the stream or river unless there is good reason as it protects the banks.
- Do not cut down a dying or dead tree unless there is a real danger of blockage (natural accumulation of materials deposited by the water): it provides refuge for wildlife (unless there is a risk of infestation of neighboring trees by parasites and diseases).
- Identify and protect (by planting a stake) saplings during brush clearing operations.
- Do not grub up stumps.

When should maintenance be performed on a bank?

Contact the representatives of your country's administration to find out whether work on banks is regulated and should be performed at specific times of the year.



For French sites:

The times of year during which work may be performed depends on their fishing category (see below).

- Mid-October to mid-November on Category 1 rivers and streams.
- Mid-October to mid-February for Category 2 rivers and streams.

Rivers and streams are classified in two fishing categories depending on their population. Fishing and work rules are different for each category.

- Category 1 corresponds to water in which salmonids (trout, salmon, etc.) live.
- Category 2 water mainly accommodating cyprinidae (carp, barbel, roach, etc.).

Contact your local water police service to find out which fishing category your stream or river is classified in.

Improve the condition of the vegetation along a stream or river

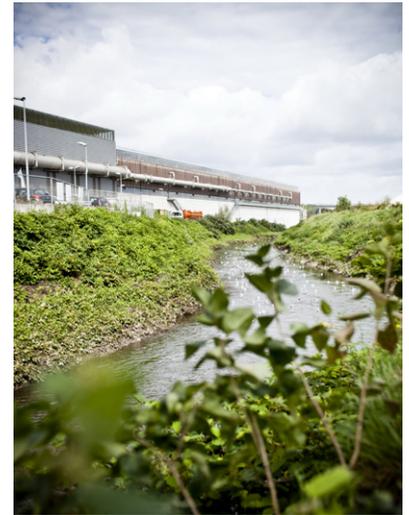


Intermediate



External assistance relevant

- Choose species whose roots can grow deep close to the bank and contribute to its consolidation:
 - cut the branches a few centimeters from the stump to allow the emergence of shoots and ensure deep rooting.
 - plant new plants in areas of the bank affected by erosion which are not protected by trees.
- Conversely, gradually remove trees whose roots cannot grow deep near the banks.
- Remove or limit the proliferation of Invasive Alien Species (see sheet on Managing Invasive Alien Species).
- Alternate areas of light and shade along the river or stream
- Plant shrubs and bushes at the foot of the bank and trees at the top of the bank.
- Give priority to keeping banks in a natural state (i.e. avoid mineralization and containment): a dammed up river is less functional and will not play its role as a temporary storage area for flood waters.



Prevent the risk of accumulation of natural materials deposited by the water (blockages)



Easy



External assistance relevant

- Remove trunks and branches that could fall across the stream or river.
- Prune branches leaning over the river or stream which retain waste.
- Prune bushes whose branches are growing in the bed.

Sources

Mission interservices de l'eau de Lorraine, 2009. *L'entretien d'un cours d'eau et de ses berges.*

Direction départementale de l'Agriculture et de la Forêt de l'Allier, 2006. *L'entretien des cours d'eau. Info Police de l'eau. Allier.* Disponible sur : http://www.allier.gouv.fr/IMG/pdf/Plaquelette_Entretien_cours_d_eau_cle6ddd5.pdf

Centres régionaux de la propriété forestière, 2011. *L'entretien de la ripisylve.*

LIMITING THE USE OF PLANT PROTECTION PRODUCTS

1. Why limit the use of plant protection products?
2. Techniques to implement to prevent the growth of unwanted plants
3. Weeding techniques that do not use plant protection products
4. Education and communication actions

European Directive 91/414/EC of July 15, 1991 concerns the marketing of plant protection products. In particular, it provides the scope, implementation, definitions, general provisions, and the establishment of a Community list of authorized active substances. European Directive 98/8/EC of February 16, 1998 is intended to regulate the marketing of biocidal products in Europe. In France, this Directive was transposed in Articles L. 522.1 et seq. of the French Environmental Code.

The water framework directive (WFD - Directive 2000/60/EC of the European Parliament and Council of 23 October 2000) is intended to reduce the pressure of plant protection products on aquatic environments and limit transfers of pollution into groundwater and waterways to achieve good ecological and chemical status of all EU waters by 2015.

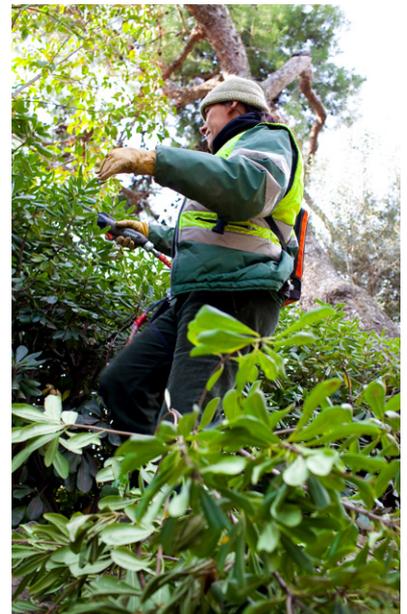
In France, following on from the Grenelle Environment Forum, the Écophyto 2018 Plan constitutes the engagement of the stakeholders which jointly developed it to reduce the use of pesticides by 50% nationwide within ten years, if possible.

1 WHY LIMIT THE USE OF PLANT PROTECTION PRODUCTS?

The substances contained in plant protection products are effective in controlling or eliminating organisms (plants or animals) considered undesirable because these substances are toxic. Using pesticides therefore has a number of negative impacts on biodiversity and humans. Such as:

- water pollution: pollution seeps into groundwater threatening the water resources we use everyday
- air pollution: pesticides affect the soil and air which in turn has consequences on the quality of ecosystems (destruction of non-target organisms, disease, and the rapid multiplication of certain species due to the disruption in ecological balance, etc.)
- impact on human health: studies have shown the presence of pesticide residues in water, air, and food. Pesticide residues have also been found in blood, urine, fat, and even breast milk.

Furthermore, these chemicals can be costly to purchase and dangerous to handle.



2 TECHNIQUES TO IMPLEMENT TO PREVENT THE GROWTH OF UNWANTED PLANTS

These techniques involve not leaving bare soil.

Spread mulch over them



Easy



External assistance not required

Organic mulch prevents unwanted plants from growing, saves water by keeping the soil moist, and enriches the soil (unlike using plastic sheeting for the same purpose).

Mulch can be purchased commercially (bark, wood chips or wood debris, flax and hemp mulch, cocoa shells, coconut fibers, etc.). However, it is better to recycle the site's green waste (shredded branches and plants, grass cuttings or clippings dried for a day or two, dead leaves, straw).



Examples of natural mulch:

Product	Effective life	Cost	Spreading thickness	Advantages / disadvantages	
Crushed branches	3 - 5 years	Nil (cost of crushing)	5 - 8 cm	 more resistant, recycling on-site	 watch out for diseased trees

Grass cuttings	A few weeks	Nil	8 - 10 cm	more abundant, increases soil fertility	low life
Dead leaves	6 - 12 months	Nil	10 - 15 cm	increases soil fertility, very good humus, protects insects during the winter	watch out for diseases

Mulch is spread over wet soil with a minimum thickness of 5 cm. To maintain a good layer, mulch needs to be regularly topped up.

Using ground-cover

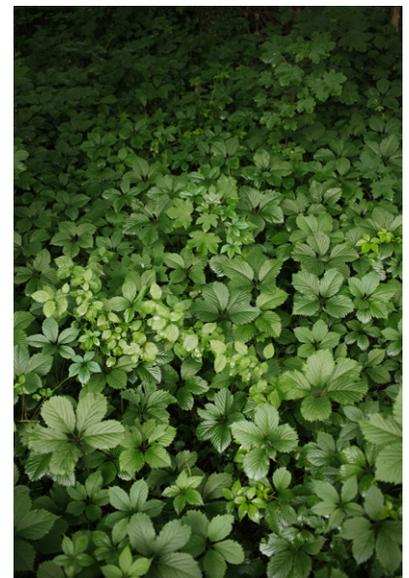
 *Intermediate*  *External assistance not required*

Using ground-cover under hedges or trees prevents unwanted plants from growing and saves water. Ground-cover is often very vigorous and rapidly growing plants that are creepers or cover the ground. They form very dense cushions of vegetation which stabilize the soil, limit erosion, and, most importantly, prevent weeds from growing.

Before planting them, pull up (manual weeding) any unwanted species growing in the area. Prefer local perennials with an interest for wildlife (honey plants, etc.).

Lay a felt made out of biodegradable fibers (burlap, flax, hemp) in flowerbeds.

 *Easy*  *External assistance not required*



3 WEEDING TECHNIQUES THAT DO NOT USE PLANT PROTECTION PRODUCTS

Manual or mechanical weeding

 *Easy*  *External assistance not required*

Performed using a hoe, rotating brushes, or rotary harrows, manual or mechanical weeding has the advantage of being very simple to do. It is also cost effective (tools are cheap) but requires significant human investment.

Thermal weeding

 *Intermediate*  *External assistance not required*

This technique is only effective on young plants. It should not be used on asphalt surfaces.

There are various thermal weeding methods: indirect flame weeding (infra-red), direct flame weeding, steam, hot water, foam, etc. The first two techniques require fire safety precautions when vegetation is dry. The last three techniques consume large amounts of water but rain water can be collected from the roofs and stored for this purpose.

False seedbed

 *Intermediate*  *External assistance not required*

The false seedbed technique should be implemented in an area which is intended to be sown later on. It involves leaving the stock of seed naturally contained in the soil to germinate and then weed to reduce subsequent weed control after sowing. The method is simple:

- 3 - 4 weeks before the planned sowing date, turn over the surface of the soil.
- Use one of the techniques above to remove the plants that have grown.

Topping

 *Easy*  *External assistance not required*

This involves cutting off the reproductive part of unwanted plants (flowers) just before flowering to prevent the plant from reproducing.



4 EDUCATION AND COMMUNICATION ACTIONS

 *Easy*  *External assistance not required*

The presence of residual vegetation in places where it was previously eradicated by pesticides might not be understood by site employees. Therefore, you should explain the reduction or non-use of plant protection products is motivated by environmental reasons and not neglect or budget restrictions, as has been experienced on the sites of some other companies. Information can be provided to employees by installing an explanatory sign in front of the spaces concerned.



LIMITING INTERFERENCES GENERATED BY SITES

1. Light less but better
2. Reduce noise pollution
3. Neutralize potential traps for wildlife

1 LIGHT LESS BUT BETTER

We talk about light pollution because the use of artificial light at night has strong impacts on a number of species. Each year, approximately 100 million birds die after colliding with buildings or getting lost on their migration route. In addition, some species are attracted to the light becoming more exposed to their predators.

Besides these impacts on biodiversity, an estimated 50% of artificial light energy is directed towards the sky. For example, in North America, the light energy used to unnecessarily illuminate the sky costs nearly two billion dollars every year.

This sheet presents the means you have to light less but better to reduce your site's impact on biodiversity and save energy.

Only light what really needs to be lit.

Indoors:

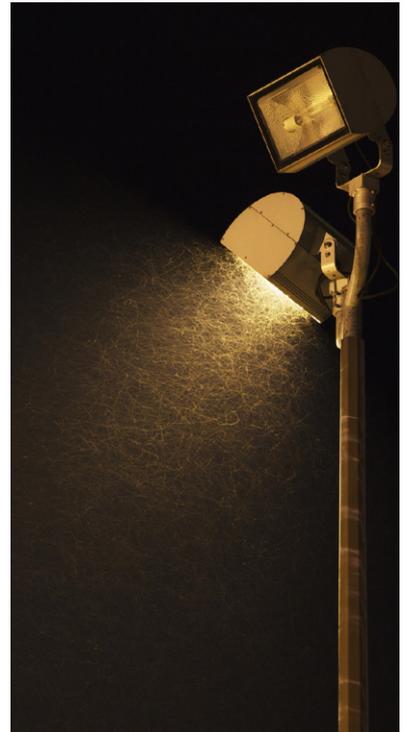


Easy



External assistance not required

The first simple step to take is to switch off the lights inside buildings when they are no longer used (usually at the end of the day).



For French sites:

It is now a legal requirement to switch off lights no later than one hour after closing time (Order of 25 January 2013*).

* <http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000027003910>

Outside:



Easy



External assistance not required

Some sites or areas of sites do not need to be lit at night. Therefore, it is recommended to not illuminate these areas. For example, there is no need to light a car park which is not used at night, building walls, or green spaces.

Certain areas do not need to be illuminated for the entire night but safety during movement needs to be provided through the night. Solutions exist (movement sensors, light sensors, astronomical clocks) to only light when necessary and avoid unnecessary continuous lighting.

Do not illuminate the sky



Easy

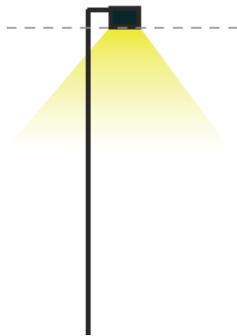


External assistance not required

To reduce light pollution, lamps should project light towards the ground and not towards the sky. For this, it is recommended to choose a model



fitted with a bulb inside a casing which is positioned as horizontally as possible (see diagrams).



Light pointing towards the ground: prefer



Light pointing towards the sky: avoid

The Association Française pour la Protection du Ciel et de l'Environnement Nocturnes (ANPCEN) has developed a diagram showing which lights to use and which should be avoided.



Choosing the right light bulb



Easy



External assistance not required

It is recommended to use light bulbs that emit little or no ultraviolet light as this impacts wildlife.

Installations that produce a bright light or that illuminate areas not visited at night.

Horizontal projectors.

Streetlights with exposed bulbs.

Streetlights embedded in the floor and pointed to the sky.

Installations that favor focused light rather than halo lighting.

Projectors directed towards the ground.

Streetlights with perfectly protected bulbs

Another recommendation

 *Intermediate*  *External assistance not required*

If possible, use a dark non-reflective coating (matt or granular) on illuminated grounds (10% of street light is reflected towards the sky by the ground).

2 REDUCE NOISE POLLUTION

Noise greatly disturbs animal behavior. For example, it affects the perception of croaking of the various species of frogs altering reproduction. A close relationship has also been observed between increased noise levels and decreased nesting bird density.

Noise affects all living things and especially humans. Noise is classed as the primary source of pollution in many countries.

Reducing noise pollution generated by your site has three advantages:

- it will reduce the disturbance for biodiversity
- it will reduce potential risks of complaint from residents
- it will improve employee working conditions.

Does my site generate noise pollution?

Many countries have established thresholds above which noise is considered pollution in their regulations on noise. However, these regulations almost exclusively concern human health and do not provide for other species.

Scientific studies have not defined a threshold over which noise can be considered to have an impact on biodiversity.

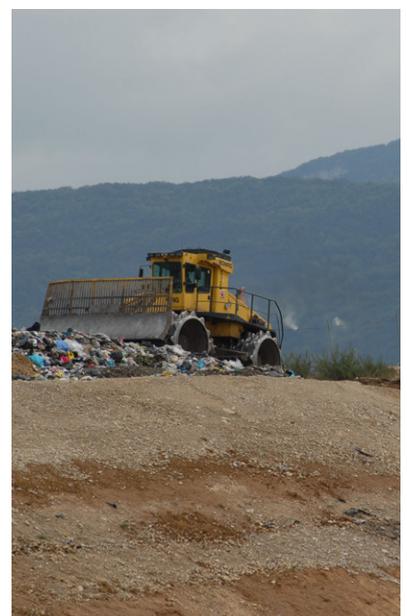
However, a site can be considered to emit noise pollution that is harmful to biodiversity from the moment there is a difference between noise levels when the site is in operation and when the site is not in operation.

What to do to reduce or eliminate noise pollution generated by a site?

 *Complex*  *External assistance necessary*
It is recommended to contact a soundproofing specialist who will be able to advise on the most appropriate system for your site.

There are several possibilities to resolve noise pollution generated by your site (compressors, fans).

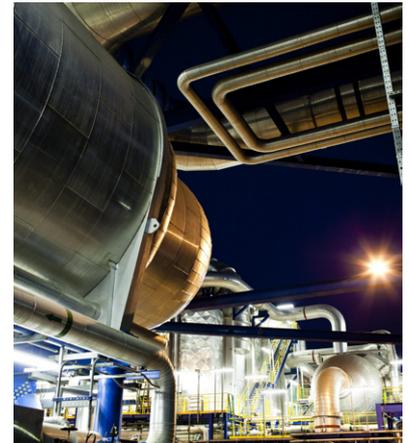
1. Remove the noise source (removal of equipment generating noise). This solution requires a change in processes.
2. Replace noisy equipment by more modern and quieter equipment.
3. Soundproof the equipment (or the room in which it is installed). Several processes are possible for this:
 - acoustic insulation (to limit the transmission of sound from a space



generating noise to another to be protected)

- acoustic correction of the room generating noise (to reduce the duration of noise after the end of its emission)
- confinement the machine generating noise
- installation of mufflers (to reduce transmission of noise through a duct, pipe, or opening).

Note, these changes must not be made to the detriment of employee safety (in particular, sound alarms must still be effective).



3 NEUTRALIZE POTENTIAL TRAPS FOR WILDLIFE

Some areas on-site can result in high wildlife mortality. Things can be done to reduce and even prevent this.

- Installation of mesh/nets on one side of water detention basins to allow animals which have fallen in to climb out without outside help.



 *Easy*  *External assistance not required*

- Put a 45° inclination on curbs near wet areas to allow amphibians to climb over these obstacles.
- Reduce grate size to avoid amphibians being washed down the drains.



 *Intermediate*  *External assistance not required*

- If there is a high mortality rate on a road, build a toad tunnel or another road crossing system.

 *Complex*  *External assistance necessary*

- A high amphibian mortality rate could be explained by the presence of a pond on the other side of the road which they are trying to reach. The creation of a replacement pond would prevent the animals from trying to cross the road.



 *Intermediate*  *External assistance not required*

Sources

Legifrance : <http://www.legifrance.gouv.fr>

ANPCEN : <http://www.anpcen.fr/>

MANAGING ALIEN INVASIVE SPECIES

1. What is an invasive alien species?
2. Which species are considered invasive alien species in my country?
3. Why do invasive alien species need to be managed?
4. What regulations apply?
5. Avoid the introduction of invasive alien species on sites
6. Monitor for early detection
7. Act rapidly

1 WHAT IS AN ALIEN INVASIVE SPECIES?

Invasive alien species or invasive species are species that have been introduced (deliberately or accidentally) into a new territory, outside its natural range by humans and whose establishment and spread threatens ecosystems, habitats, or native species (species originating from a given area) with negative consequences for ecosystem services and/or socio-economic and/or health.

Note that the vast majority of introduced species are not and probably will never be invasive (e.g. tomatoes, potatoes, or maple-leaf plane trees which were introduced to Europe and which are not invasive).

**An ecosystem is a group of living organisms (plants, animals, etc.) and their associated environment (climate, altitude, geology, etc.) in a defined area. These living organisms interact with their environment.*

**Ecological services means the benefits we can obtain from nature (e.g. food, wood, drinking water, etc.).*

2 WHICH SPECIES ARE CONSIDERED INVASIVE ALIEN SPECIES IN MY COUNTRY?

To find out which species have been identified as invasive alien species in your country, you can consult the Global Invasive Species Database:

<http://www.issg.org/database/welcome>

This is a global database of invasive alien species which lists invasive alien species by country, among other things.

**The database is managed by the Invasive Species Specialist Group (ISSG) which is a group of International Union for Conservation of Nature (IUCN) specialists in invasive alien species.*

3 WHY DO INVASIVE ALIEN SPECIES NEED TO BE MANAGED?

Because of their impact on biodiversity described above, invasive alien species are recognized as one of the main causes of biodiversity loss on a par with habitat destruction.

These species also cause other harm. They are a major threat to economic activity (production losses, costs to manage them, damage to infrastructure, etc.) and human health (allergies, burns, transmission of diseases, etc.).



4 WHAT REGULATIONS APPLY?

There is no binding global legal framework to manage IAS.

A European regulation on the prevention and management of the introduction and spread of IAS in the European Union came into effect in 2015. It is based on the establishment of a list (as yet non-defined) of invasive alien fauna and flora species of concern for the European Union. Prevention, early detection, and rapid response to manage the species on this list will be mandatory and will be imposed on all stakeholders, including businesses.



5 AVOID THE INTRODUCTION OF INVASIVE ALIEN SPECIES ON SITES

This involves acting upstream to prevent the arrival and establishment of an invasive alien species on a site. Prevention is generally more cost effective and environmentally desirable than the management measures required once a species is established. Effectively, once an invasive alien species has colonized a site, it is extremely difficult to eradicate.

For plants

- **Before planting green spaces on site:** ensure that no invasive alien species identified as such in your country are on the list of species to plant and use alternative species if necessary. Keep the list of species planted.
- **Sow or plant local species** on bare soil to limit the spread of invasive alien species by competing with them.
- **During construction:**
 - Require the systematic cleaning of machinery and employee footwear before moving between sites (e.g. dredging or weed cutting machinery for basins) to prevent the transport of plant fragments that might take root later on.
 - Limit the introduction of external products (topsoil or backfill) which could contain invasive alien species stalk or rhizome fragments.

Avoid maintaining bare soil, i.e. without planted vegetation. Disturbed soil can be rapidly colonized by invasive alien species as they have a broad spectrum of action and easily adapt to a wide variety of environments.

For animals



Intermediate



External assistance relevant to install systems to protect the site against invasive alien species that might enter the site

Identify areas that are favorable to invasive alien species (particularly bodies of water). If invasive alien species are found close to the site, it might be necessary to protect the site by installing protection systems (barriers, nets, etc.).



**A rhizome is an underground stalk from which fibrous roots and aerial shoots sprout.*



6 MONITOR FOR EARLY DETECTION



Intermediate



External assistance relevant to find out which species are likely to develop on your site, to educate employees, and provide the tools required to identify species.

Monitoring allows the appearance of a new species to be detected. It should be over the entire site and focus on environments that could host alien invasive species such as the recently developed environments, non-vegetated disturbed habitats, wasteland, water, and banks. Early detection combined with rapid response can limit the impact of the species on the



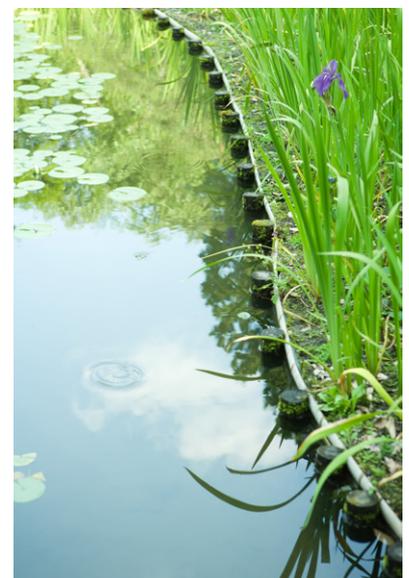
environment or human activities. This also helps maximize the chances of success of management actions and reduce costs relating to eradication.

Raise awareness among employees about the problem and train them to identify invasive fauna and flora species (using photos, books on the topic, and field work).

Implement regular site monitoring: walk over the grounds and cross all habitats to detect any invasive plants or animals. Draw up a list of these species.

As monitoring the entire site or all sites might be difficult, adapt a more pragmatic approach by identifying priority sites or habitats to monitor. Focus on disturbed habitats, path edges, equipment storage areas, open areas suitable for the establishment of numerous plants, wasteland, the banks of bodies of water, and non-vegetated areas.

If you notice a very rapid spread of an unidentified species, it could be an invasive alien species. **Immediately inform** the site's environmental manager and your local nature conservation partner, if any, to identify the plant and promptly take appropriate action.



7 ACT RAPIDLY

Define the appropriate management action



Intermediate



External assistance required: contact a local structure with expertise in invasive alien species. It could assist you in identifying management methods to implement given the species to manage and the local context.

Once the presence of an invasive alien species on site has been confirmed, a management action can be implemented. There are a number of different types of management action.

- For plants: grubbing (manual or mechanical), cutting, grazing, felling, binding, sheeting, etc.
- For animals: traps, hunting, etc.

No technique guarantees a 100% success rate: each has its advantages and limits! (e.g. grubbing up large areas can promote the establishment of other invasive alien species or native species that have a tendency towards being invasive which in turn will colonize the environment).

The Global Invasive Species Database: <http://www.issg.org/database/welcome> does not provide management recommendations but, for certain species, it does list the management means already used to manage them which are listed in books.

It is important to note that invasive alien species management actions are site-specific and must be adapted to local contexts and the species to manage. **Therefore, no management method can be generalized and directly implemented without any adaptation.**

Furthermore, the eradication of an invasive alien species (i.e. an action to totally and permanently eradicate it) can be considered when the invasive alien species is present in a very localized area, i.e. in the early stages of colonization.

However, eradication is generally impossible when the species is widespread. However, actions can be taken to control the spread.

Take measures to avoid the spread of invasive alien plant species



Intermediate



External assistance relevant: contact a local structure with expertise in invasive alien species.

Management actions can result in the accidental spread of the target invasive alien plant species thereby neutralizing the effectiveness of actions. It is therefore essential to take the following precautions:

- Take action on plant species as early on in the season as possible, i.e. as soon as seedlings sprout or as soon as the plants are robust enough to be pulled up without breaking. In all cases, management actions should preferably be performed before seeds are formed (before fruiting) to avoid their dispersion.
- Containment of the area being treated in case of action on submerged or amphibian species. This could result in installing netting or filter dams.
- Minimum fragmentation of the plants to remove on-site as fragments can take root.
- Recovery of plant fragments as quickly as possible: manual collection or using a net in aquatic environments to remove fragments of all sizes including in hard to reach places.
- Secure storage of invasive alien plants or earth that could contain fragments of rhizomes or seeds: preferably store in waterproof bags (big bag), otherwise lay on tarpaulins laid on the floor.



How to manage waste generated by the management action



Intermediate



External assistance relevant: contact a local structure with expertise in invasive alien species which will inform you on which waste management method can be used.

Special attention must be paid to managing invasive alien species waste, in particular green waste (waste that is not removed from the site could disperse cancelling out the benefit of the management action).

Find out about the regulations in force in your country to find out which type of management action is possible.

Generally, avoid composting waste as there is a risk of spreading invasive alien species along with the compost.



For French sites:

The management action's sponsor is in charge of disposing of waste (in this case, your company) even if you have used a service provider to manage the plants or trappers to manage animals.

Residues from plant removal are treated as organic waste and specifically green waste (Article R. 541-8 of the French Environmental Code). The global waste management regulations apply to organic waste.

Left on-site	Unauthorized. There is also a high risk of waste left on-site re-colonizing the environment.
Storage in a landfill	Unauthorized.
Open burning	Unauthorized. However, exemptions may be granted by the Prefecture if the following four conditions are met: <ul style="list-style-type: none"> • the period is not concerned by a pollution episode. • the site is located in a peri-urban or rural area (outside a town). • the site is outside of the scope of Atmosphere Protection Plans (APP) and outside an area said to be sensitive to the deterioration of air quality • there is not collection and/or waste drop-off centre in the municipality or group of municipalities.
Incineration	Possible in approved centers. However, this solution is not recommended due to atmospheric emissions. For cement sites: ask about the possibility of burning IAS waste in the plant's furnace.
Composting	Possible give your waste to a composting unit.
Anaerobic digestion	Possible give the green waste to an anaerobic digestion plant.
Spreading over farmland	Possible for some species. The addition must be included in a Spreading Plan.



Founded in 1992, the French IUCN Committee is a network of organisations and experts in the International Union for Conservation of Nature in France. Within an original partnership, it groups together 2 ministries, 13 public bodies, 41 non-governmental organisations and more than 250 experts, organised into specialised commissions and theme working groups.

Through this mixed composition, it is a unique platform for dialogue and expertise on biodiversity issues, also including local authorities and companies. Prompting all the players to mobilise, it supports several French enterprises in together drawing up and implementing a specific policy on biodiversity.

In partnership with Veolia since 2008, this Guide to ecological management was drawn up in this context

This document was prepared by Veolia's Communications Department of Veolia in May 2016.

Editing: Sustainable Development Department.

Creation and production: Creative studio supports, Communications Department.

Document produced within the scope of the IUCN France/Veolia Environment partnership.

Photo credits: Élodie Russier-Decoster ; Virginie Chambon ; Veolia photo-library (Gaël Arnaud, Art Com, Salah Benacer, Samuel Bigot/Andia, Alexis Duclos, Philippe Ermanian, Rodolphe Escher, Olivier Guerrin, Stéphane Harter/agence VU, Stéphane Lavoué, Christophe Majani d'Inguimbert, Richard Mas, Margaux Plantive-Triger, Jean-François Pelegry, Jean-Marie Ramès, Rod Tamlyn/Andrew Robertson ; VES Sheffield).

