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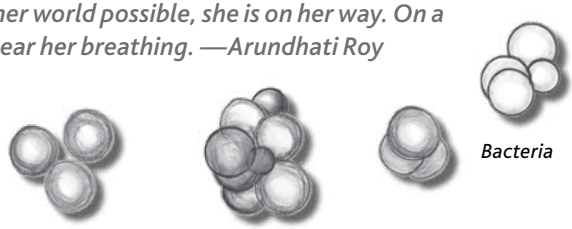
What Is an Eco-yard?

Not only is another world possible, she is on her way. On a quiet day, I can hear her breathing. —Arundhati Roy



Bacteria

So, what exactly is an eco-yard? An eco-yard is a landscape—usually the grounds around a home or building—with a full, rich ecosystem that is healthy and alive. At the very least, an eco-yard causes no harm in its presence or by its care, to the environment. At best, an eco-yard enhances and restores the natural environment.

The eco-yard concept embraces right relationship with the Earth—the whole Earth and all its beings—at the most local level, our own yard. An eco-yard is also an ideal to move toward, holding right relationship as an aspiration and a vision. An eco-yard is about stewardship and partnership with the natural ecosystem rather than control. Scientists are still learning about the complex interactions in nature (of which humans are a part) that support life. It seems that, whenever we do things in our landscapes much differently than does the natural world, we create a lot of unnecessary work for ourselves and hamper the natural ecosystem, not just in our yards but globally.

A diverse and healthy landscape will require less maintenance than what has been standard in the North American yard—until now. An eco-yard can look after itself with a little help from its stewards—and as much love and care as the stewards wish to lavish on their eco-yard!

GENERAL PRINCIPLES OF ECO-YARDS

Eco-yards embody five general attributes or principles. They foster and display

- a full, rich ecosystem
- diversity
- co-creation with nature
- a variety of designs
- sustainability

FULL, RICH ECOSYSTEM

An ecosystem is a system in which many species support each other in living well in a certain terrain, climate and area. So a yard can have its own ecosystem that is part of the neighborhood ecosystem, which is part of the ecosystem of a town or city, which is part of the ecosystem of the geographical region, which is part of the global ecosystem of the Earth including all of the plants, animals, birds, reptiles, rocks, rivers, mountains, oceans, fish, microbes, insects and the atmosphere.

In any ecosystem, the various plants, insects, birds, animals and other living beings come to fill niches—certain roles they play to support the other beings in the ecosystem and in which they in turn are supported. In its own niche, a plant will thrive.

Certain insects, birds and even bats can play the role of pollinator for specific plants. Plants in flower are like flashing neon lights to a pollinator and let the pollinator know that the diner is open. For example, a blueberry plant is supported in reproducing by the native bees that bring pollen to it from other blueberry plants. These bees eat nectar provided by the blueberry. Pollination by the bees allows the flower to produce berries full of seeds that will grow new blueberries. Then birds and other animals eat the blueberries. They help the blueberry plant spread to new areas by carrying seeds to other places.

Humans are part of the ecosystem too. The plants provide us with food (such as blueberries), and we can play many roles in support of plants, such as planting seeds, watering the plants, weeding, feeding the plants with compost and pruning.

Those Clever Grasses

Michael Pollan is a wonderful thinker about plants and how we interact with them as part of our ecosystem. He has written a number of books, including *The Botany of Desire*, *The Omnivore's Dilemma* and *In Defense of Food*. He has a fun take on how grasses have enticed humans into protecting their niche in the ecosystem—especially cereal grasses like rice, wheat and corn: we humans cut down trees, keep the ground clear and plant and tend the cereal grasses. If it weren't for humans, much of the global ecosystem now planted in cereal grasses would be some kind of forest or jungle.

Micro-organisms are vital to a full, rich ecosystem

While such interactions between members of an ecosystem are going on before our eyes, other vital but less visible interactions are going on among billions of micro-organisms and other members of the ecosystem, including plants. These we can only see by looking at a leaf, root or soil sample under a microscope. This teeming soup of micro-organisms (or microbes) on leaf and needle surfaces and clustered around roots is the foundation of life on Earth and life in your eco-yard. See Chapter 8, Soil: A Feeding Frenzy.

Plants release foods to the micro-organisms on their leaves and at their roots, and the micro-organisms make soil nutrients available to the plants. Without microbes, plants couldn't use the nutrients in the soil. Microbes are essential to plant life. Because everything on Earth relies directly or indirectly on plants for food at some point in the food chain, microbes are fundamental to life on Earth.

Soil micro-organisms: ciliate-eating bacteria, amoeba, nematode-eating bacteria

Aim for balance

The healthiest ecosystems contain a great diversity of species in many different niches, and all the niches are filled. In a healthy ecosystem, the various members of the ecosystem keep each other's influence and numbers in balance.

Balance is important and therefore something to consider in an eco-yard and for the ecosystem as a whole. For example, be mindful of the balance between predator and prey. Often, due to human influence, a natural predator species may be eliminated or reduced, and then another member of the ecosystem overpopulates and may ravage the species that it eats. For example, in the Chicago area, there are no natural predators for deer. So in some of the green belts, many plants that would normally grow under the trees can't because the deer eat them. Parks authorities are fencing off some areas to protect the plants.

Invasive ox-eye daisies

istockphoto.com/fotoVoyager

Also be aware of the effect on balance when a species is brought in from another ecosystem. Because the original ecosystem has no controls for that new species, it can invade and take over niches that native plants and animals had previously filled. Examples of invasive plants are Himalayan blackberries on the northwest coast of North America, ox-eye daisies in Waterton Lakes National Park in Canada

and purple loosestrife in eastern North America. In your eco-yard, it is important to check with local nurseries or garden centers that the species you are planting are not invasive species that could spread from your yard to the neighboring ecosystem. To support balance, then, be mindful about adding something that may invade the local ecosystem and about taking away an existing species that may be keeping others in check. (See Resources section for a website on invasive species.)

The key to balance is organic

Chemical pesticides, and to some extent chemical fertilizers, kill the micro-organisms that ensure your plants get fed. In fact, any potent substance, organic or not, that kills insects, weeds, fungi, rodents and algae will also harm other beings in the system. The key to a healthy, balanced ecosystem is to enhance the micro-organisms in your soil and on your plants, not kill them off. So it is wise to use only organic products that sustain life in your eco-yard. Compost and actively aerated compost tea are effective tools to build micro-organic life. (See Chapter 9, The Wonders of Compost.)

DIVERSITY

Diversity—a collection of many different species—is important to a healthy ecosystem. When many species take up niches and play their various roles in an ecosystem, more support is available to all. It's like organizing a large event: it takes a number of people playing a number of roles (event planners, hotel staff, transportation support, printing staff for the invitations and menus, etc.)—the more varied the roles, the better the support for the event. It's often easier to organize and stage an event in a large city because there are many people in each niche who can do the job. By contrast, in a small town, individuals must often take on more than one role, filling several niches. This can be taxing for both the individual and the organizational group. Worse, if that person must give up their role, without a replacement the whole system is weakened.

Diversity is also important should conditions of the ecosystem change. If conditions no longer support particular species that play certain roles, those species can die off, allowing others to take over those

A Little Talk About the Birds and the Bees

How exactly do plants make more plants? Plants reproduce in many ways. More than half reproduce sexually via pollination, which happens when pollen (containing plant sperm or male genes) enters a plant's pistil or ovary (female part of plant). Some plants have both male and female parts, either in the same flowers, or in different flowers or cones. Plants that are only male or only female, such as poplars, are known as dioecious plants.

Some plants, such as the common poppy shown opposite, are self-pollinating—the male parts can fertilize the female parts on the same flower or elsewhere on the same plant. Others need cross-pollination, which happens when pollen from one plant's stamen travels to a separate plant's stigma. Cross-pollination is important for genetic diversity in a species.

Many plants require help—from the wind or from pollinators such as insects (including bees and butterflies), hummingbirds and even bats. When a pollinator comes to plants to sip nectar or collect pollen, some pollen sticks to it. When the pollinator then visits another plant, the pollen is carried to the second plant where it rubs off, thus cross-pollinating it. Flowers have evolved to specific shapes, colors and scents that attract specific pollinators. For example, some plants feature a little platform for the pollinator. Trumpet-shaped flowers attract hummingbirds. So do red, pink and orange flowers—visible from far away.

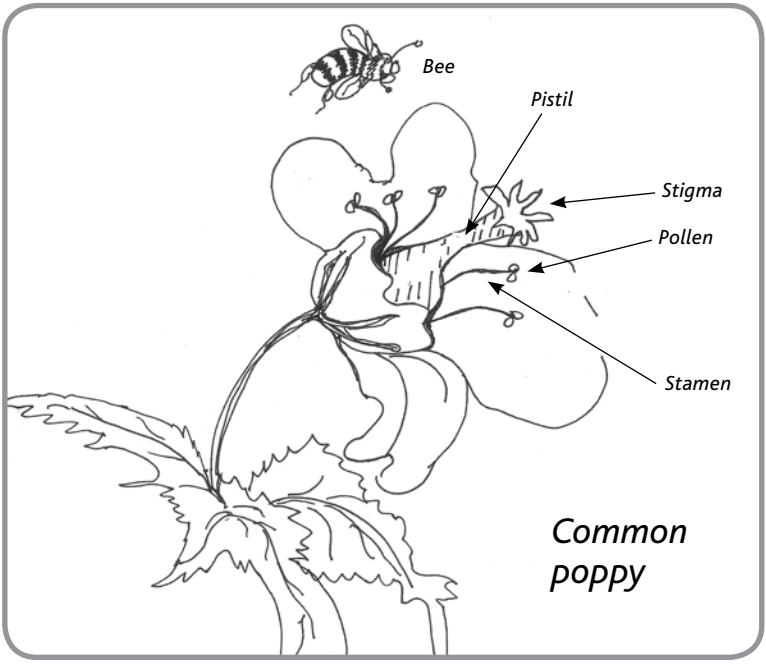
Do you like to eat apples, blueberries, strawberries, almonds, melons, peaches or pumpkins? Then you have a serious interest in preserving pollinators and their habitats.

niches or roles. With a wide variety of species, a number of backup species can fill in as needed. If you have only one lead soprano for an opera and she loses her voice, without a second trained and ready to fill in, the whole performance is in jeopardy. Similarly, an ecosystem can crash if vital roles are left unfilled.

In Ireland in the 1800s, people depended on a single food crop—potatoes. The potato plants were all of one type, with very little genetic diversity. When a potato blight was introduced from elsewhere and the weather conditions were right for the blight to thrive, all the

Did You Know?

- Cone-bearing plants (such as pine) produce pollen that travels on the wind from a male cone to a female cone of the same species, perhaps on the same tree.
- Hummingbirds need to eat twice their weight in nectar every day.
- Butterflies have taste cells on their feet.
- Two human activities in particular have had a major impact on pollination patterns: clearing farmland and later abandoning the same land.
- Bird, bat and bee populations have declined because of pesticide use and habitat fragmentation.
- Plants have co-evolved with their pollinators, so many species of plants have only one specific insect or other creature that pollinates them.
- 75% of the world's flowering plants depend on pollinators.
- More than 90 food crops eaten in North America depend on pollinators.



potatoes were susceptible. The potatoes rotted, and more than ten percent of the people died during the famine that resulted. In the 1970s, corn crops of all the same type were wiped out by a fungus in the United States, and in the following decade in California, grapes of all the same type were devastated by an insect pest.[1]

Our eco-yards can play a role in restoring diversity in our neighborhood or regional ecosystem. Native plants (ones that naturally grow in that area or region) may have been removed by developments such as housing, farmland or roads. In our eco-yards we can grow native plants or hardy plants (those that grow well in the region) that can fill the same niches as native plants. These provide food to the local pollinators (usually insects such as bees and butterflies) and often the local birds and wildlife. All of this supports the natural ecosystem of the area.

CO-CREATION WITH NATURE

An eco-yard with a rich, diverse, healthy, organic ecosystem that enriches and supports the natural ecosystem of the region and the Earth—how best to design and steward that? Copy nature! And co-create with nature in your eco-yard.

Natural Maintenance

To achieve a prairie ecosystem in an eco-yard, fire can be used in a controlled fashion every year or every second year to keep it healthy. Native prairie restoration advocates have worked with municipalities to ensure that local laws will permit this controlled burning. In some urban settings, goats and sheep are doing duty—grazing on weeds and keeping roof gardens and lawns trim.

The succession process

To understand how to co-create with nature, it's helpful to understand how plant life naturally progresses. In nature, grassed areas or meadows are usually gradually taken over by other plants in a process called succession. If the earth is disturbed, such as by a landslide or

fire, first weeds will grow, then grasses and perennial flowering plants, then shrubs and then trees if conditions are right for these to grow. The ultimate stage of succession is an old-growth forest or jungle made up of large tall trees with smaller trees, shrubs, perennial flowering plants and annuals growing under them and usually vines growing on them. In areas with challenging conditions for plants, such as the arctic or the desert, the full succession process usually does not take place. Deserts and the arctic can still have plants though.

Because grass is usually replaced by shrubs and then trees, mowed lawn is rare in nature. However, fires and animals grazing and trampling are two factors that can keep areas like prairies and savannahs at the grasses stage of succession.

Here are some examples of landscape types, co-created with nature, you might find in an eco-yard:

- low-maintenance lawns of hardy grasses that require little water, mowing or added nutrition
- hardy, perennial flower beds (flowers that live over winter and bloom every year)
- woodland gardens with trees, shrubs and flowers underneath
- meadows of grasses and flowers

An eco-yard usually combines some or all of these.

In an eco-yard, the desirable plants and insects keep the undesirable ones in check. Hardy plants and grass types thrive in existing natural conditions and/or need little water. Natural wood chip or leaf mulches on flower, shrub and tree beds prevent weeds, retain moisture in the soil and add organic matter to the soil.

The Old-growth Look

Old-growth forest may be something to aspire to in an eco-yard. However, most urban residents and neighbors prefer more sun and light as well as plants that grow in the sun. Your old-growth eco-yard design could include a few large trees in areas where they allow sun and light to the house and parts of the yard.

An eco-yard may take extra labour and cost to install at first. But over the long term, eco-yards are the most environmentally and pocketbook-friendly as well as the easiest to maintain.[2]

Other types of landscapes, such as conventional lawn with annual flower beds, can be well maintained as eco-yards with the use of natural landscaping practices—it just takes a bit more up-front labour.

A VARIETY OF DESIGNS

Eco-yards can have many different features as well as unique combinations of features. A diversity of eco-yards is healthy for nature and makes the landscapes of our cities, towns and rural areas more interesting and varied.

Eco-lawns

Of the many yard features you could choose, the typical lawn of Kentucky bluegrass is the biggest user of water and chemicals and takes the most work to maintain. A key eco-yard principle is to confine lawn to just those areas where it is used for play and picnics.

City Parks and Green Spaces Can Be Eco-yards

City parks and green spaces can be naturalized eco-yards too! Naturalization means planting and allowing native or hardy vegetation to grow in open spaces. Urban open spaces can have mowed grass only where needed for recreation (sports, playgrounds, picnic areas, walking areas) or for access to facilities (e.g., near power poles). Areas near major roads can be planted with shrubs or hardy grasses that can be left to grow. In the long term, taxpayers save money on mowing grass, and the naturalized area will provide more habitat for beneficial insects and wildlife (imagine hearing meadowlarks or other songbirds again) and will add beauty to our urban spaces.[3] You can lobby your town and city councillors to encourage them to naturalize public spaces. To see great examples of how cities can naturalize, visit Edmonton, Alberta; Waterloo, Ontario; and Boulder, Colorado.

I've found that many people aren't quite ready to let go of their lawns, or maybe they have a space where grass is appropriate. In these cases, eco-lawns are a good alternative. An eco-lawn is made up of hardy grass types that require little water or feeding. Some of these grass types grow short and, even in towns and cities, can be left without mowing. Clover, low wildflowers or other plants can also be part of an eco-lawn.

Having an eco-lawn means getting used to grass that is a lighter green color. Letting hardy grasses go unmowed also means a more natural look. In one of my yards, I even let the Kentucky bluegrass-based grasses grow long and just mowed pathways through the lawn—I loved the look, and it was a lot less work than mowing the whole lawn!

Front yard gardens

Old practices are coming back to urban front yards (and back yards too!). For example, you could plant a vegetable garden in your front yard or a grove of aspen poplar trees. You might plant perennial flowers, shrubs and trees in your yard. A low, colorful look of flowering groundcover plants (yes, you can get varieties that grow, even in places like Calgary!) is another possibility for your eco-yard. The trend is continuing toward a wonderful variety in urban landscaping.

SUSTAINABILITY

Sustainability involves thinking, imagining and caring about future life on Earth. It means that the practices you're using can be carried on from now into centuries in the future and will sustain life on Earth. In other words, sustainable practices provide ongoing support and nurturance for life.

Most current conventional landscaping and farming practices epitomize a non-sustainable approach. Everything that grows naturally is killed by chemicals, excavating or tilling, then replaced with plants that often don't grow well in that locale. To stimulate growth, these plants are fed artificial chemical food and chlorinated water, which just leads to more need for more added resources. There definitely are better ways!

Logs used for a raised vegetable bed

Log slices from trees cut by arborist used for a pathway

Sustainable materials

Not only should the methods of maintaining the eco-yard be sustainable, so too should the materials and their sources.

A sustainable material is one whose collection, manufacture and use sustains life. Plastic is an example of a non-sustainable material, at least the plastic that is currently made from non-renewable petroleum and manufactured with the use of non-renewable energy. Petroleum-based plastic also does not biodegrade and ends up in landfills, which are usually not a sustainable solution to garbage.

An example of a sustainable material is wood chips made from prunings—tree branches that have been removed from a tree. Instead of going to a landfill, the chips go in your yard as mulch around plants to retain moisture. I prefer chips from arborists to chips from lumber mills as the lumber may not have been harvested from the forest in a sustainable way (e.g., by selective logging, in which only some trees from an area are removed).

Another example of a sustainable material is local rock that has been excavated to make way for development. This rock can be used for walls or walkways. Using local rock is more sustainable than using rock imported from far away because of the transport factor. Landscaping rock is being shipped around the world now, crossing the seas from

No Need for Landfills

In the early 1980s, I lived in a village in the jungle in Kalimantan, Indonesia. The people there threw out refuse, all of which consisted of natural materials, in their back yards. There it would be eaten by pigs and other animals, and the manure would quickly biodegrade and become compost. Food was wrapped in banana leaves for sale or transport. Plastic bags and containers were just coming into use, and it was obvious this was going to become a problem. The village had never needed a landfill for so-called trash because everything had biodegraded as part of the natural cycle. Unfortunately, bits of bright blue plastic were beginning to be scattered behind the houses.

countries such as India to North America. Trucks, trains and ships mostly use petroleum, a non-renewable resource that creates pollution and greenhouse gases. A material can be considered more sustainable when it requires less transport.

Designing for sustainability

An eco-yard can be designed to support sustainability. For example, strategically placed trees can cool a building in summer and still allow winter sun to warm it. This cuts down on pollution associated with cooling and heating.

By growing food in your yard, you avoid food transport and therefore reduce pollution and resource use. Another way to support sustainability is to choose plants that require little extra water or care in your ecosystem.

Sustainable maintenance

Sustainable maintenance practices include

- minimal or no use of gas-powered or electric machinery
- spreading compost and spraying actively aerated compost tea rather than using chemical fertilizers

SUMMARY

- An ideal eco-yard enhances and restores the natural ecosystem, locally and globally.
- Co-creating with nature is a guide to designing eco-yards.
- Minimizing lawn area is a key design principle for eco-yards.
- Use sustainable materials and design to minimize non-renewable resources use.
- Each eco-yard can be unique—diversity is great!
- An eco-yard can be an ideal to work toward—it can be co-created step-by-step over time.

NOTES

1. "Monoculture and the Irish Potato Famine: Cases of missing genetic variation," *Understanding Evolution*, evolution.berkeley.edu/evolibrary/article/_0_0/agriculture_02.

2. Jean-Marc Daigle, *Residential Landscapes: Comparison of Maintenance Costs, Time and Resources*. Commissioned by Canada Mortage and Housing Corporation (Ottawa: Government of Canada, 2000). Available only in print—a copy can be requested free by calling the CMHC library at 1-800-668-2642. This study followed 30 gardens in southern Ontario over two years—with seven different landscape types. All inputs were tracked. The study also included hypothetical designs of seven types of gardens and the costs to install and maintain them over a ten-year cycle. A literature review was also part of the study. You can read about low-maintenance lawns at cmhc-schl.gc.ca/en/co/maho/la/la_004.cfm.

3. The Coalition for a Healthy Calgary website at healthycalgary.ca has a good section on how city green spaces can be naturalized. It includes lots of examples of areas where naturalization has been successful. Waterloo, Ontario, and Boulder, Colorado, also have good websites. You can link to them from healthycalgary.ca.