

A GARDENER'S GUIDE TO A HEALTHIER ENVIRONMENT

HOW YOU CAN PREVENT POLLUTION
THROUGH
BENEFICIAL LANDSCAPING



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How could *gardening* be bad for the environment?

Wasted Water and Water Pollution - We waste millions of gallons of water each year through inefficient watering practices (running a hose for an hour can use up 375 gallons of water). We also plant many species that are not adapted to our climatic conditions, often requiring significant watering. Runoff from our gardens carries fertilizers, pesticides, soil and other pollutants into our streams, lakes and bays, degrading water quality and harming aquatic life.

Air Pollution - Although small engine emissions have been reduced as a result of recent clean-air regulations, landscape equipment with two-cycle gasoline-powered engines is still a significant contributor to air pollution. These hydrocarbon emissions create ozone, which in turn is very harmful to humans, wildlife and vegetation. Gas-powered string trimmers and blowers are among the most polluting pieces of equipment.

Pesticides - Although less than 10% of all insects are harmful to plants, the average gardener uses pesticides at a rate per acre of 10 times that of a farmer. Pesticides are often applied at inappropriate times, such as when insects are not vulnerable, and sprayed indiscriminately over large areas. While in some situations pesticides are unavoidable, overuse and inappropriate use often kill beneficial insects and other wildlife. Pesticides have the potential to cause serious human health problems, as well, when not handled properly or applied with caution.

Solid Waste - Organic yard waste is a major contributor to the landfill crisis in America. It accounts for roughly 20% of municipal solid waste collected each year; half of this is grass clippings.

Noise Pollution - Noise pollution from landscape equipment has compromised the serenity of our neighborhoods and damages hearing in individuals.

Loss of Diversity - Plants that we innocently introduce to our gardens can seriously impact nearby natural habitats. Plants like Norway maple, Japanese honeysuckle, kudzu, purple loosestrife and crown vetch either grow or self-propagate at such a rate that they outcompete native vegetation, resulting in reduced habitat values and loss of biodiversity.

Americans spend an estimated yearly \$950 million on fertilizers and around \$1.5 billion on pesticides for landscape uses.

In 1990 approximately 70 million pounds of pesticides were used in gardens around the U.S.

Around 3,000 plant species in the U.S. today are introduced (non-native) - that's about 16% of the total flora. The kudzu vine, infamous now in the Southeast U.S., is estimated to cover more than 7 million acres... and it's still spreading, choking out native plants.

A lawnmower pollutes as much in one hour as does driving an automobile for 350 miles.

In the U.S. 20 million acres are planted in residential lawns - equal to 3 times the size of Maryland.

Annually, 30- 60 % (depending on city) of urban fresh water is used for watering lawns.

In the U.S. each year 60- 70,000 severe accidents result from lawnmowers.

But gardening *needn't* be bad for the environment.

TRADITIONAL LANDSCAPING, where we plant vast lawns dotted with trees and formal hedges, often of exotic origins, is at the root of the problem. Manicured lawns and formal arrangements require a great amount of care, which often translates to pollution from mechanical equipment and heavy use of chemical fertilizers and pesticides. Many of us strive to grow perfect examples of relatively few plant species, most of which are non-natives and often poorly adapted to our climatic and soil conditions. Fortunately, there are alternatives that are less polluting and at the same time attractive, cheaper and easier to maintain.

BENEFICIAL LANDSCAPING (or natural landscaping) is one of the best alternatives. It calls for a more natural or informal design using a greater variety of plant species, most of which should be native to your area. By switching to a less formal design, plants can assume their natural shape and size and you will be relieved of the frequent need to trim and prune. By using a greater variety of plants you will also reduce the potential for major disease and pest problems and any damage that might occur will be less noticeable.

Reducing the size of the lawn is another major component of beneficial landscaping. Lawns, by their very nature, are time and resource intensive, so reduce their coverage to the minimum necessary; in many cases it might even be prudent to eliminate turf entirely. Replacement plants can include a variety of trees, shrubs, grasses and groundcovers. Any lawn remaining can be made more environmentally friendly by changing maintenance practices.

Reduce the use of chemical pesticides and fertilizers through Integrated Pest Management (IPM) and other means. IPM is a common sense approach that utilizes the most economical and least toxic practices to manage pest damage.

Avoid and remove invasive exotic plants. These are plants not native to your region that spread rapidly and outcompete more beneficial native plants, thus reducing the diversity of plants and animals in our natural areas.



Use plants to reduce your home heating and cooling needs. By planting deciduous trees (those that lose their leaves in winter) on the south and west sides of your home, air-conditioning bills can be reduced significantly. Likewise, evergreen trees planted to block winter winds can help to reduce heating bills.

Other beneficial landscaping practices related to the above include, reducing the use of power landscape equipment, practicing soil and water conservation, composting yard waste, creating wildlife habitat, and, perhaps most important of all, protecting existing natural areas.

GETTING STARTED

A BALANCED LANDSCAPE, EVERYTHING IS IN CHECK, INCLUDING DISEASES AND PESTS. ALL GREEN PLANTS EMIT OXYGEN, WHICH HUMANS AND ANIMALS NEED TO BREATHE. THE MORE BIOMASS (VOLUME OF VEGETATION), THE MORE OXYGEN PRODUCED. THUS, A RICHLY LUXURIANT GARDEN, ESPECIALLY A WOODLAND, HAS MUCH BETTER AIR QUALITY THAN A LAWN. WHEN WE TAKE INTO ACCOUNT THE HARMFUL IMPACTS FROM MOWERS AND BLOWERS, AND FROM RUNOFF OF FERTILIZERS AND PESTICIDES, LAWNS CAN EVEN BE HARMFUL TO THE ENVIRONMENT. THE FOLLOWING PROVIDES SOME TIPS FOR GETTING STARTED ON YOUR OWN NATURAL GARDEN.

The most important first step in designing or redesigning a garden is doing a thorough site analysis. First, determine the size and shape of the area in which you will be working. Then, inventory existing vegetation and any other significant site characteristics (wetlands, rock formations, etc.). Removal of any invasive plant species will be more easily accomplished before new plantings are added.

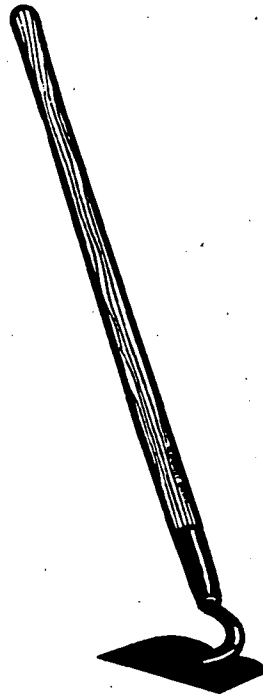
The next step is to analyze your soil. Understanding the soil type, texture (moisture holding capacity), pH level (degree of acidity or alkalinity), and organic content will help you later in making your plant selections. Acid soil can be made less so by adding lime or gypsum, and the organic content of your soil can be improved with the addition of leaf mold, manure, bark, or compost, however, it is best to choose plants that thrive in conditions that exist on your property rather than to try to modify the environment to meet the needs of specific plants.

Climatic conditions are also important to understand. Knowing from what direction the prevailing winds on your property come at what time of the year can, for example, help you to determine where you might wish to plant evergreens as wind-breaks. Deciduous trees can reduce heating and cooling energy needs

up to 30% by shading the south and west sides of buildings in summer, and by allowing sunlight to warm buildings in the winter. Trees should also be used to shade paved areas and thus reduce summer heat buildup that can be stressful for other plantings.

Another potential for pollution prevention is found in land form. Runoff rates from a site can be reduced through subtly manipulating your site's topography. By creating shallow depressions, water will have more time to percolate into the soil, rather than running off the site into storm drains. Larger water features can be created, as well, and provide for increased biodiversity. In addition to being a visual focal point, ponds and wetlands can serve as stormwater retention basins. For child safety and maximum wetland wildlife value, the pond periphery should be gently sloping (the shallow water is ideal for many wetland plants) and the center should be 3-4 feet deep to provide a safe haven for fish and amphibians from cats, raccoons, and winter freezing. Fish, frogs, and snails will help keep insect populations under control and reduce buildup of algae. Because of the value of our fast-disappearing wetlands, excavation and filling activities should be kept to higher, previously-disturbed ground.

You can begin your plant selection process by first understanding what type of plant communities might have naturally occurred on your site according to the soil



type, amount of shade and degree of wetness. Native species should be considered first, as they have been proven hardy to the area. Research available plants through reputable nurseries, garden clubs, agricultural extension services, botanic gardens and libraries. Keep in mind that many nurseries, particularly the large national and regional chains, sell a wide variety of plant material, some of which may not be hardy or native to your area. Exotic plants, unless carefully selected, can be high in maintenance, and may even spread out of control in the landscape. By selecting the proper plants, you are not only on your way to having a healthier garden, but you will be preventing pollution by conserving water and not having to prune, fertilize, nor apply pesticides as frequently (if at all)! For starters, see the list of selected, desirable native plants as well as invasive plants to be avoided towards the end of this guide.

As a consumer, you can make a difference in the availability of native plants for home gardens. If enough customers request native plant species, nurseries will begin to stock them. Be aware, however, of where the native plants originate. Wildflower seed collected in one region of the country, while it might belong to the same species of a plant found in your area, has adapted to different climatic conditions and is not really the same as locally-found seed. Also, make sure that the plants you obtain have been grown in nurseries and not collected in the wild - unless you know they have been salvaged from an area slated for development.

Plant a variety of species rather than one (a monoculture) or a few. Monocultures, in addition to being fairly sterile environments, are very susceptible to infestations of harmful insects and rapid spread of disease. Weather stress can also be very damaging to this type of garden.

Be sure to consider the ultimate size and shape of plants before selecting them and check to ensure you have appropriate space to accommodate their future growth. You'll want to avoid the need for regular pruning or removal should they later block windows or grow into utility lines.

LAWNS AND ALTERNATIVES

- REDUCE LAWN AREAS TO A MINIMUM
- CHANGE LAWN MAINTENANCE PRACTICES

Out of the English tradition of pastoral landscapes grew the American tradition of the front lawn. For many, it's an essential component of the American dream, and lends a sense of order and beauty to the home landscape. In some communities, residents face pressure to keep their yards in highly manicured and mowed grass. If you feel having a lawn is necessary (and in most cases it's not), there are better alternatives to keeping it healthy without creating a significant amount of pollution.

To save yourself time and energy and naturally fertilize your lawn, invest in a **MULCHING MOWER**. These machines finely chop lawn trimmings and instead of blowing them out a discharge chute like regular mowers, the trimmings are blown down into the lawn where they are left to decompose and act as fertilizer. The need to rake, bag and dispose of clippings is thus eliminated, although some mulching mowers provide features that capture clippings, in case you want to add them to your compost pile. **REEL-TYPE PUSH MOWERS** are the better choice for small lawns.

In the summer, set your lawnmower cutting height to 2.5 - 3 inches for fescues and ryegrass to reduce the stress that heat and sun place on the lawn; this will reduce the amount of watering and weeding required, too. In general, don't cut more than one-third of the grass blade, and never more than one inch total at one

mowing. The short clippings, when left on your lawn, will decompose and return to the soil as natural fertilizer. This will help your lawn's ability to retain moisture and reduce erosion, as well as, reduce the amount of grass clippings going to landfills. Additional fertilizing should be limited to no more than one fall application of a slow-release, water insoluble nitrogen (WIN) fertilizer, such as sulfur-coated urea or other natural organic fertilizers. Keep lawnmower engines properly tuned so that fuel is burned more efficiently. Have mower blades sharpened yearly; dull blades damage the grass, making it more vulnerable to summer stress and fungal diseases. Finally, consult with your county's extension agent for lawn care tips specific to your area.

When possible, however, there are alternatives to the traditional lawn that can be implemented to provide beautiful and healthy landscapes and still be attractive in an urban area. One way is through the use of ground covers. A variety of texture and color options exist, and many do well in shaded or partially shaded areas. They can provide flowers and fall color, and require far less maintenance than

the average lawn.

By extending planting beds you can further reduce lawn area. Native shrubs provide a natural hedge, a backdrop for perennial beds, and habitat for wildlife.

In drier areas, consider installing native grasses and wildflowers for a landscape that attracts

birds, beneficial insects, and provides a changing landscape with each new season. In wetter areas, native wetland plants will thrive where grass and other plants will struggle. Where local zoning ordinances permit it, collect or redirect runoff from roofs and paved surfaces; the water can be used for gardening during droughts or to feed a wetland or bog garden.

PLANTING FOR WILDLIFE

-PROVIDE SOURCES OF SHELTER, WATER AND FOOD.

As development continues to consume remaining open space throughout the United States, critical wildlife habitat is lost. Some of that habitat can be replaced through thoughtful planning and planting. In addition to using native trees, shrubs and ground covers that provide shelter and nesting sites, artificial sites can be added to your garden in the form of bird or bat boxes (bats eat mosquitos!), and bird baths or other small water elements.

To maximize the number and variety of animals you attract to your

For patient gardeners, one way of getting rid of unwanted lawn is to smother it. Black or clear plastic, or newspapers can be laid over the lawn area during hot weather and will kill weed seeds up to six inches deep. This method can take up to six months to be fully effective.



garden, use a variety of plant species, both evergreen and deciduous, and plant them in clusters. In a woodland, don't neglect the understory layer - it provides habitat for many small mammals, insects and amphibians. Rocks and fallen branches, too, are valuable for wildlife and can be attractively used in the landscape.

Meadows are great habitat types for attracting songbirds, as well as butterflies and bees, who will help you with your gardening by pollinating various plants.

Ponds, marshes, or other water

features have great wildlife-attracting potential. You might find, too, that you have a naturally occurring water feature in your yard, such as a buried or culverted stream, that can be restored. Food for wildlife can be provided by nut-, cone-, and berry-forming trees and shrubs, as well as, flowers. Whatever type of habitat your area is best suited for, make sure to plant species that bloom or fruit at a variety of times throughout the year. There are many books available that can guide you in planting to attract particular species and provide ornamental interest.

MAINTENANCE

A NATIONAL GARDENING SURVEY DONE IN 1993 FOUND THAT 56% OF HOUSEHOLDS IN THE U.S. PURCHASED SOME KIND OF OUTDOOR FERTILIZER, PESTICIDE OR OTHER CHEMICAL. THIS FIGURE MAY REPRESENT A SIGNIFICANT IMPACT ON THE QUALITY OF OUR NATURAL SYSTEMS, PARTICULARLY WATER. IF YOU'RE HAPPY WITH YOUR EXISTING GARDEN AND NOT READY TO MAKE MAJOR CHANGES TO IT, YOU CAN STILL MAKE SIGNIFICANT REDUCTIONS IN POLLUTION BY ALTERING YOUR MAINTENANCE PRACTICES.

COMPOST / CLIPPINGS

Rather than discarding plant materials after cleaning up and pruning, create a compost pile or enlarge your existing one. Excess clippings, leaves and pruned branches make excellent compost ingredients that can later be applied as a soil additive or mulch for vegetable and flower gardens. (Although, in a truly natural garden, it's beneficial to allow most branches and leaves to remain where they'll decay and provide habitat and nutrients.) For lawns, use a composting mower to eliminate the need to dispose of excess grass clippings and provide a natural source of nutrients, reducing or eliminating fertilizer needs.

Chipped bark and branches can make an excellent natural path through your

Building a Compost Pile

On a piece of exposed, level ground begin layering different types of compost materials. Start with something coarse and dry, like brush. The next layer should be something green and "wet", such as grass clippings. Finally, add a layer of soil. Continue to layer in this fashion, using food scraps for your "wet" layer. (The larger your pile is to begin with, the more heat it will generate and the faster material will decompose.) Avoid meats and fish - these decompose slowly and attract pests. Any other kinds of fruit, vegetable or garden waste will make great compost, though, and, so long as you have a healthy mix of "drys" and "wets", your pile won't begin to smell.

Occasionally turning your pile with a pitchfork will speed up the process, and eliminate any fruit fly problems that might arise. Your compost is ready when none of your original ingredients is recognizable, and you have a nice, dark, loamy soil instead. This can take anywhere from a few months to a year or more, depending upon methods used and your climate. Generally, though, leaves added to the compost pile in the fall are ready to use as a soil additive the following summer.

garden, and can be used, along with compost, as mulch for planting beds and cover around trees and shrubs. Mulches reduce weeds and soil erosion, conserve water and moderate soil temperature.

TOOLS / EQUIPMENT

Use hand tools whenever possible to tend your garden. Power tools are noisy and their energy demands and emission levels are excessive. Electric tools are quieter, but electricity generation (particularly the mining and burning of coal) causes significant air and water pollution. Push mowers, brooms, and hand rakes are not only non-polluting, but they provide exercise to the user and are less dangerous. When power equipment proves necessary, take extra precautions to avoid fuel spills (use leakless nozzles), maintain equipment properly (engines well-tuned and blades sharpened), use protective clothing, and show consideration regarding the noise generated. When shopping, buy equipment that is the quietest, cleanest-burning and most fuel efficient. During periods of impaired air quality, refrain from using power equipment, particularly those with gasoline engines.

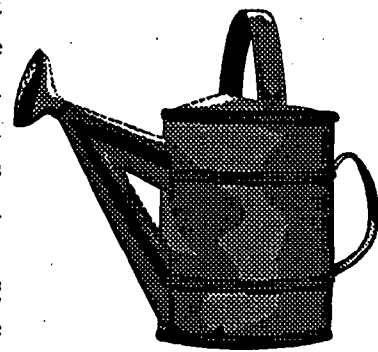
WATERING

Conserving water in the garden starts with selecting appropriate plants for your climate, soil, and light conditions. You'll want to cluster plants with similar moisture requirements and apply mulch or, in the truly natural garden, allow leaves and other organics to naturally decompose. Watering should then only be necessary after planting and during severe droughts.

Drip irrigation is one of the most efficient forms of watering. It is especially valuable on slopes where runoff and risk of erosion are high. When watering, apply the necessary amount of water (normally, about 1" per week, taking into account rainfall, is ample) and at the appropriate time.

Rain gauges and soil moisture probes can help you judge the need.

Early morning applications are best followed by evening, as there'll be less water wasted through evaporation. Also, one deep watering is preferable to numerous light waterings which only wet the surface and encourage shallow, vulnerable root growth. Timers, underground sprinklers and other devices that control application rates and amounts are also recommended. Finally, rainwater can be collected from roofs and other surfaces, as can gray water from showers and sinks, for watering lawns and gardens.



PESTICIDES

Using a variety of native plants should reduce the damage from pests in the garden, but problems will sometimes arise. Before pulling out the pesticides, research your problems to make certain you know the causes and alternative means of treatment. Help can be obtained from reference books, nurseries, garden clubs, agricultural extension agents, and /or botanic gardens. Timing of corrective measures can be critical, so examine the life cycles of harmful insects so that you can take action when they're most vulnerable.

Limit your use of chemical pesticides. First, consider integrated pest management (IPM) practices. In a balanced, natural garden, most diseases and harmful insects are kept in check and rarely pose a serious problem. Encourage natural pest predators to inhabit your garden; these include birds, ladybugs, lacewings, toads, and praying mantises. A variety of flowering plants is essential to attracting many beneficial insects such as butterflies and bees. Remove pest eggs, larvae, galls, and cocoons by hand. Good sanitation in the fall means fewer pests in the spring. Companion planting is a term given to the use of some plants to benefit (or protect) others, usually by serving as an insect repellent. When you determine that pesticide use is absolutely necessary, first try the least toxic alternatives such as biological agents, horticultural superior oil sprays, insecticidal soaps and soap solutions (a simple home mix combining 2.5T liquid soap with 2.5T cooking oil and 1 gallon water can be effective). These soaps are not toxic to humans, but may harm beneficial insects in the garden so apply sparingly. Also, some plants are sensitive to the soaps, so test the application before using it widely. Powdered boric acid, dehydrating dusts (diatomaceous earth and silica gel) and insect growth regulators, which kill the insects or interrupt their reproductive cycles, are some other alternatives. *Bacillus thuringiensis*, known also as B.t., is a bacterium that attacks specific

Glyphosate is the active ingredient in some herbicides, and is considered the "safest" by many conservationists. It does not leave a harmful residue on surfaces or enter groundwater (it adheres to soil particles), and is only toxic to wildlife in quantities probably too large to ingest. For the most control in application, buy the concentrated form and dilute it yourself. It can be applied to the cut stumps of troublesome trees or shrubs, or sprayed on the leaves of herbaceous plants. Glyphosate does not discriminate but kills the leaves of every type of vegetation - when applying, be sure you only hit your targeted species. For more about glyphosate and its specific application, see Sara Stein's Planting Noah's Garden.

insect groups, depending on which strain is chosen. It is safe for humans, but make sure you purchase the right strain for the pest you are trying to eliminate from your garden. For more severe infestations, use pyrethrin-based insecticides. For all pesticides, follow directions carefully, use adequate protective gear and apply only away from water bodies, when winds are calm and rain not forecasted.

Buy pesticides only in the smallest quantity necessary and store carefully in airtight, labeled containers in a secure area, out of the reach of children. Use proper gear and extreme caution when mixing and applying. Don't wash down spills, but rather blot with absorbent material and dispose of in a strong plastic bag. Spilled or excess material should be disposed of at hazardous waste drop-off locations, if

available, instead of in household trash or down drains or sewers.

Finally, remember that even when used sparingly and cautiously, pesticides can and do get into nature's food chain and while they may not be harmful to your plants, they may harm wildlife and impair your health. Learn to accept minor damage from disease and insects as being part of the natural cycle.

FERTILIZER

Nitrogen and phosphorus from fertilizer, while they occur naturally in soil, can be detrimental in excessive amounts. When used excessively on lawns, gardens and agricultural crops, they run off or eventually

leach from the soil and end up in water bodies; there they stimulate the growth of algae which

Some common landscape pests and the plants that will serve as natural repellents:

<u>Pests</u>	<u>Plant Repellents</u>
Ant	Mint, tansy, pennyroyal
Aphids	Mint, garlic, chives, coriander, anise
Bean leaf beetle	Potato, onion, turnip
Codling moth	Common oleander
Colorado potato bug	Green beans, coriander, nasturtium
Cucumber beetle	Radish, tansy
Flea beetle	Garlic, onion, mint
Cabbage worm	Mint, sage, rosemary, hyssop
Japanese beetle	Garlic, larkspur, tansy, rue, geranium
Leaf hopper	Geranium, petunia
Mexican bean beetle	Potato, onion, garlic, radish, petunia, marigold
Mice	Onion
Root knot nematodes	French marigolds
Slugs	Prostrate rosemary, wormwood
Spider mites	Onion, garlic, cloves, chives
Squash bug	Radish, marigolds, tansy, Nasturtium
Stink bug	Radish
Thrips	Marigolds
Tomato hornworm	Marigolds, sage, borage
Whitefly	Marigolds, nasturtium

in turn depletes oxygen necessary for the sustenance of fish, crabs, shellfish and other organisms. Fertilizer should be kept off paved areas, so it doesn't wash directly into storm drains and into water sources. When buying

fertilizer, consider slow release products (for example, fish emulsion) as they minimize excess nitrogen runoff. Make sure you fertilize at appropriate times for your plants. For example, cool weather grasses need only be fertilized once a year, in the fall. And don't exceed recommended application rates.

MISCELLANEOUS

Hardscaping (decks, patios, walkways, etc.) Are often an important part of garden or yard design. While hard surfaces do increase stormwater runoff, this can be mitigated by using semi-pervious surfaces such as wood, brick-on-sand, or gravel. In place of wood decks, consider plastic lumber which is rot resistant and never needs staining. For a path with a natural or "woody" feel, use mulch. Where you do use paving, light colored surfaces are preferable to dark ones, which, collectively, contribute to urban "heat islands." This additional heat also places stress on nearby plants.

IN CONCLUSION...

The cumulative environmental impacts of each of our gardening practices is quite significant. Please do your part to be more environmentally friendly, then go a step further and encourage your friends and neighbors to do the same. It will take all of us working together to make this a cleaner, healthier environment.

**PLEASE PRACTICE POLLUTION
PREVENTION BY SHARING THIS
BROCHURE WITH OTHERS WHEN YOU
ARE FINISHED WITH IT.**

THANK YOU

SOME RECOMMENDED PLANTS FOR THE MIDDLE ATLANTIC STATES

Some native trees:

Serviceberry	<i>Amelanchier canadensis</i>
River birch	<i>Betula nigra</i>
Hornbeam	<i>Carpinus caroliniana</i>
Redbud	<i>Cercis canadensis</i>
Fringe-tree	<i>Chionanthus virginicus</i>
Flowering dogwood	<i>Cornus florida</i>
American beech	<i>Fagus grandifolia</i>
White ash	<i>Fraxinus americana</i>
Red cedar	<i>Juniperus virginiana</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Tulip-tree	<i>Liriodendron tulipifera</i>
Sweet-bay magnolia	<i>Magnolia virginiana</i>
Black gum, tupelo	<i>Nyssa sylvatica</i>
Sycamore	<i>Platanus occidentalis</i>
Willow oak	<i>Quercus phellos</i>

Native shrubs:

Chokeberry	<i>Aronia arbutifolia</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Sweet pepperbush	<i>Clethra alnifolia</i>
Gray dogwood	<i>Cornus racemosa</i>
Witch-hazel	<i>Mamelis virginiana</i>
Winterberry	<i>Ilex verticillata</i>
Virginia sweetspire	<i>Itea virginica</i>
Mountain laurel	<i>Kalmia latifolia</i>
Bayberry	<i>Myrica pensylvanica</i>
Arrowwood	<i>Viburnum dentatum</i>
Black-haw viburnum	<i>Viburnum prunifolium</i>

Groundcovers:

Wild ginger	<i>Asarum canadense</i>
Lady fern	<i>Athyrium filix-femina</i>
Violet wood-sorrel	<i>Oxalis violacea</i>
Creeping phlox	<i>Phlox stolonifera</i>
New York fern	<i>Thelypteris noveboracensis</i>

Some native perennials for shady areas:

Goat's beard	<i>Aruncus dioicus</i>
New England aster	<i>Aster novae-angliae</i>
Bleeding heart	<i>Dicentra exima</i>
Alumroot	<i>Heuchera americana</i>
Great lobelia	<i>Lobelia siphilitica</i>
Virginia bluebells	<i>Mertensia virginica</i>
Woodland phlox	<i>Phlox divaricata</i>
Solomon's seal	<i>Polygonatum biflorum</i>
Bowman's root	<i>Porteranthus trifolius</i>
Bloodroot	<i>Sanguinaria canadensis</i>
Wood poppy	<i>Stryphorhynchum diphyllum</i>
Foamflower	<i>Tiarella cordifolia</i>
Labrador violet	<i>Viola labradorica</i>

Perennials for sunny areas:

Butterfly weed	<i>Asclepias tuberosa</i>
Wild white indigo	<i>Baptisia alba</i>
Moonbeam coreopsis	<i>Coreopsis verticillata</i>
Joe Pye weed	<i>Eupatorium purpureum</i>
Wild geranium	<i>Geranium maculatum</i>
Swamp sunflower	<i>Helianthus giganteus</i>
Bee-balm	<i>Monarda didyma</i>
Blazing star	<i>Liatris spicata</i>
Cardinal flower	<i>Lobelia cardinalis</i>
Black-eyed Susan	<i>Rudbeckia hirta</i>
Coneflower	<i>Rudbeckia triloba</i>
Goldenrods	<i>Solidago spp.</i>

Ornamental grasses:

River oats	<i>Chasmanthium latifolium</i>
Switch grass	<i>Panicum virgatum</i>
Indian grass	<i>Sorghastrum nutans</i>
Cord grass	<i>Spartina pectinata</i>

**SOME NON-NATIVE, INVASIVE PLANTS THAT HAVE BEEN CAUSING
PROBLEMS IN THE EAST* (CONSIDER AVOIDING THEM)**

Amur maple
Norway maple
Tree of heaven
Japanese barberry
Paper mulberry
Butterfly bush
Oriental or Asiatic bittersweet
Russian / Autumn olive
Burning bush
Wintercreeper
Japanese knotwood
English ivy
Japanese honeysuckle
Purple loosestrife
White mulberry
Princess tree
Reed canary grass
Common reed
Bamboo
Kudzu
White poplar
Common / Tall hedge buckthorn
Black locust (NATIVE !)
Multiflora rose
Japanese spirea
Japanese yew
Siberian elm
Periwinkle
Wisteria

Acer ginnala
Acer platinoides
Ailanthus altissima
Berberis thunbergii
Broussonetia papyrifera
Buddleia davidii
Celastris orbiculatus
Elaeagnus angustifolia and *E. umbellata*
Euonymus alatus
Euonymus fortunei
Fallopia japonica
Hedera helix
Lonicera japonica
Lythrum salicaria
Morus alba
Paulownia tomentosa
Phalaris arundinacea
Phragmites australis
Phyllostachys aubea
Pueraria lobata
Populus alba
Rhamnus cathartica and *R. frangula*
Robinia pseudoacacia
Rosa multiflora
Spiraea japonica
Taxus cuspidata
Ulmus pumila
Vinca major and *V. minor*
Wisteria sinensis

* Check with The Nature Conservancy, the U.S. Fish and Wildlife Service, your state heritage agency, and others for additional invasive plants of concern in your area.