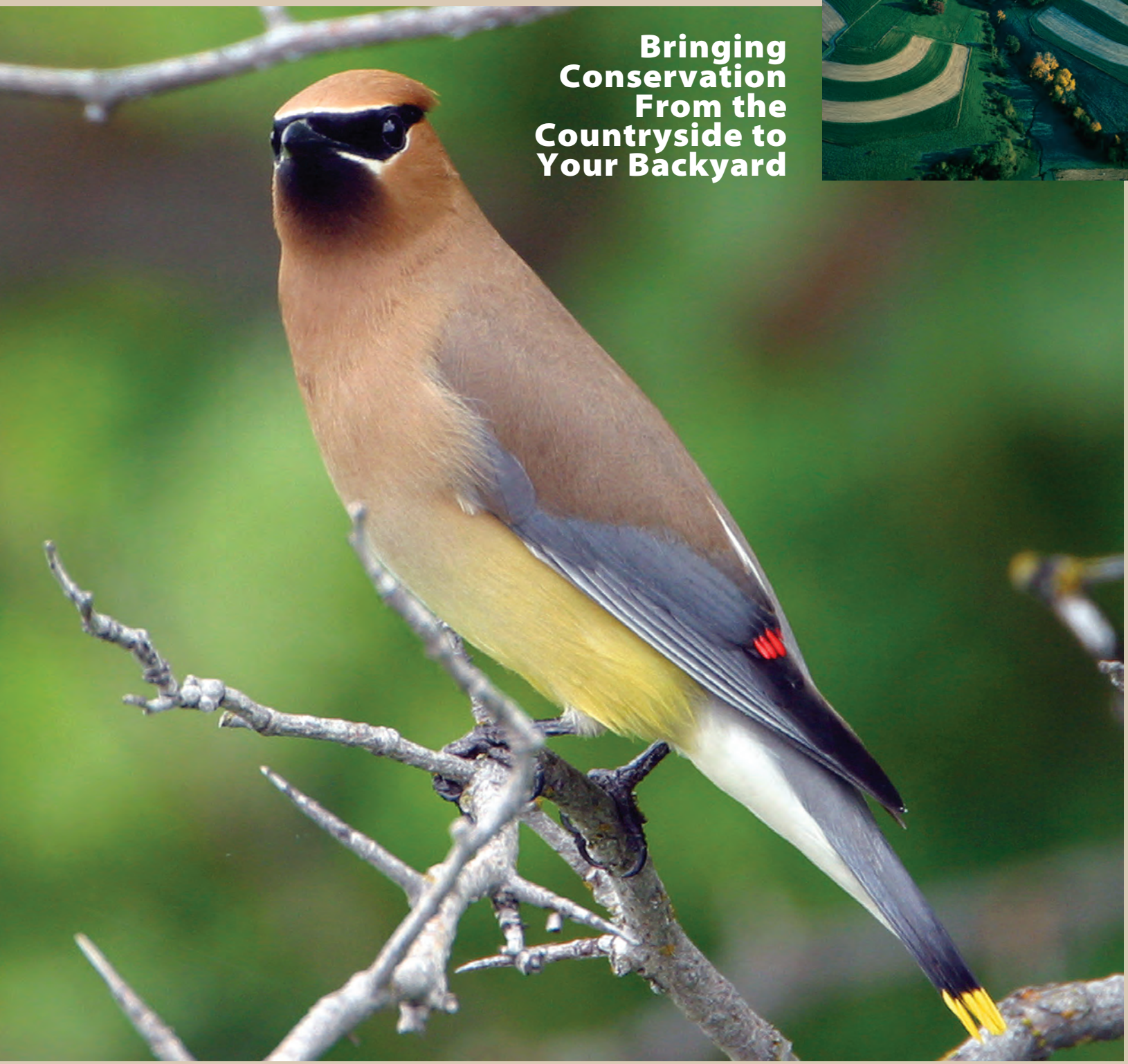
Backyard Conservation

Bringing Conservation From the Countryside to Your Backyard



Backyard Conservation
It'll grow on you.

A cooperative project of
USDA Natural Resources Conservation Service
National Association of Conservation Districts
Wildlife Habitat Council
National Audubon Society

From the countryside to your backyard

A tradition of caring for our natural resources

Jim Archambeault

Farmers and ranchers, and many homeowners, are making progress in natural resource protection. You can join their conservation tradition, right in your own backyard.

There are nearly 2 billion acres of land in the conterminous United States. About 70 percent of that land is privately owned and its care is in the hands of those who live and work on it. Most of that land, 1.4 billion acres, is managed by farmers and ranchers. More than 92 million acres of land—an area the size of California—is privately developed and much of it is tended by homeowners.

Farmers and ranchers use conservation plans to help them apply practices that meet their production objectives and protect soil, water, air, plant, and animal resources. You may want to develop a plan for your own backyard to help you apply conservation measures that fit your needs. Or maybe, for now, you'd like to try just a few of the activities in this book.

We hope you'll enjoy these activities that bring beauty and diversity to your yard—whether your "yard" is measured in acres, feet, or flower pots. We know you'll feel good about improving the environment and joining the conservation tradition of America's farmers and ranchers.

Jim Archambeault

John Hoepfner

Lynn Betts, USDA

Lynn Betts, USDA

Alana Edwards

Lynn Betts, USDA

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(top) *Contour stripcropping;* (bottom right) *Fledgling American Robin;* (bottom left) *Water and plants to attract butterflies;* (top left) *Water lily.*

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(top) *Constructed wetland with landscaping;* (right) *Purple prairie coneflowers;* (bottom left) *Finished compost;* (center left) *Atala hairstreak butterfly.*

Lynn Betts, USDA

What's in this book

In this publication, you'll see practices used to conserve and improve natural resources on agricultural land across the country. You'll see how you can use similar practices in your own backyard to help improve the environment, help wildlife, and in many cases, make the area more attractive and enjoyable.

Most backyard conservation practices are easy to put in place. Tips and highlights are given here, but for more information, or for help in developing your backyard plan, you may want to consult a local landscaper, garden club, or any of the organizations listed in the back of this book.

© Tom Munson

This book highlights 10 conservation activities, adapted from farms and ranches, that can be used in your backyard.

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Jim Archambeault

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(top left) *Cedar Waxwing;* (top center) *Backyard pond and water- loving plants.*

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(right) *Contour stripcropping.*

On the farm

Tim McCabe, USDA

Conservation efforts by many farmers and ranchers help keep the air clean; maintain good-quality water for drinking, recreation, and fish and wildlife; provide homes for wildlife; ensure healthy soil; and sustain a diversity of plants. These benefits help people, wildlife, and the environment.

Numerous Federal and State conservation programs are aimed at natural resource protection and sustainability. Many provide educational, technical, and financial assistance to help farmers consider and implement conservation practices.

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Trees add beauty and so much more.

Lynn Betts, USDA

In your backyard

Trees in your backyard can be home to many different types of wildlife. Trees also can reduce your heating and cooling costs, help clean the air, add beauty and color, provide shelter from the wind and the sun, and add value to your home.

Jim Archambeault

Choosing a tree

Choose a tree that will **provide enjoyment** for you, fits your landscape, and is not invasive in your geographical area. Take advantage of the abundant **references on gardening** in local libraries, at universities, arboretums, and parks where trees are identified, and from native plant and gardening clubs, and nurseries. Before you buy, you can find out if a tree is **appropriate for your area,** how big it will get, how long it will live, its leaf color in the fall, any nuts or fruit it may bear, and the proper planting instructions and care for that species. Make a conscious effort to **select trees native to your area.** They will live longer, be more tolerant of local weather and soil conditions, enhance natural biodiversity in your neighborhood, and be more beneficial to wildlife than non-native trees. Avoid exotic trees that can invade other areas, crowd out native plants, and harm natural ecosystems. Plant a **variety** of tree species. For wildlife, choose trees and shrubs that bloom and bear fruit or nuts at different times of the year.

Lynn Betts, USDA

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(top) *Farmstead windbreak;* (bottom left) *A restful, soothing place among the trees;* (top left) *Enjoying the backyard.*

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(top left) *Northern Cardinal nest;* (top right) *Twine will be removed before planting;* (bottom left) *Field windbreak.*

Howard B. Eskin

Lynn Betts, USDA

Planting a tree

A properly planted and maintained tree will grow much faster and live much longer than one that is incorrectly planted. **Early spring,** before bud break, is a good time to plant most trees. Trees may also be planted in the early fall if local site conditions will allow roots to begin growing. Hot summer weather is hard on newly planted trees and planting in frozen soil during the winter is difficult and tough on tree roots.

Be sure to carefully follow the planting instructions that come with your tree. If specific instructions are not available, follow these tips:

- Dig a hole twice as wide as and slightly shallower than the root ball. Roughen the sides and bottom of the hole with a pick or shovel so that roots can penetrate the soil.
- With a potted tree, gently remove the tree by cutting away the container. With trees wrapped in plastic or burlap, remove the string or wire that holds the wrapping to the root crown. Also, remove the wrapping before planting.
- Gently separate circling roots on the root ball. Cleanly cut exceptionally long roots, and guide the shortened roots downward and outward. Root tips die quickly when exposed to light and air, so don't waste time.
- Lift the tree by the root ball, not the trunk, and place the root ball in the hole. Leave the top of the root ball (where the roots end and the trunk begins) 1/2 to 1 inch above the surrounding soil, making sure not to cover it unless roots are exposed. As you add soil to fill in around the tree, lightly tamp the soil to collapse air pockets, or add water to help settle the soil.
- Form a temporary water basin around the base of the tree to encourage water penetration, and water thoroughly after planting. A tree with a dry root ball cannot absorb water; if the root ball is extremely dry, allow water to trickle into the soil by placing the hose at the trunk of the tree.
- Mulch around the tree. A 3-foot diameter circle of mulch not exceeding 4 inches in depth is common.

Early maintenance

For the first year or two, especially after a week or so of very hot or dry weather, **watch your trees closely for signs of moisture stress.** If you see leaf wilting or hard, caked soil, **water the trees well** and slowly enough so the water soaks in rather than runs off. This will **encourage deep root growth.** Keep the area under the trees mulched and free of other plants. Until the trees are deeply rooted, grasses and other plants may take up moisture before the trees can get their share.

Lynn Betts, USDA

On the farm

Windbreaks and tree plantings slow the wind and provide shelter and food for wildlife. Trees can shelter livestock and crops; they are used as barriers to slow winds that blow across large cropped fields and through farmsteads. An established windbreak slows wind on its downwind side for a distance of 10 times the height of the trees. Farmstead and field windbreaks and tree plantings are key components of a conservation system. They also improve air quality by capturing dust. Planting a mix of tree species helps prevent total losses to disease and severe weather; it also provides food, nesting areas, and cover for a variety of wildlife.

Trees, shrubs, and other plants can provide homes and food for wildlife.

In your backyard

Your backyard can be home for many different types of birds, butterflies, beneficial insects, bats, and other wildlife. Trees, shrubs, and other plants provide both food and shelter for wildlife. The types of plants you use for food and cover will help determine the wildlife species attracted to your backyard. Consider **native plant species** first. Plant a **variety of species.** Select plants that **flower and bear fruit at different times of the year.** Shrubs that produce berries can provide food throughout the year. Trees with nuts and fruit can also provide seasonal foods. Flowers and fruits of some plants attract hummingbirds and butterflies to your backyard. You also can construct **birdhouses** and other shelter and put out commercial **bird feed.**

Maggie Strucker

Lynn Betts, USDA

Attracting birds to your yard

These are examples of plants that you can grow to attract birds and other species. Be sure to check with your nursery on what grows best in your area.

Shrubs for birds

Common juniper
Highbush blueberry
Holly
*Pyracantha**
Red-osier dogwood
Serviceberry
Spicebush
Sumac
*Viburnum**
*Wax myrtle**

Trees for birds and other wildlife

American beech
American holly
Apple
Balsam fir
*Black cherry**
Black gum
Cottonwood
Crabapple
Flowering dogwood
Hawthorn
Hickory
Live oak
Oak
Red mulberry

Vines for birds

American bittersweet
Native honeysuckle
*Strawberry**
*Trumpet creeper**
*Virginia creeper**
*Wild grape**

*This plant could become invasive in some areas. Please check with a local authority (see back cover) to determine whether it is potentially invasive where you live.

© Janet Zinn

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(top) *White-crowned Sparrow;* (bottom right) *Supplemental food for birds;* (bottom left) *Interspersed native plants.*

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(top right) *Anna's Hummingbird;* (bottom right) *Eastern Bluebird, feeding young in nestbox.*

Virgil Ketner

Flowers for birds

Aster
Coneflower
Coreopsis
*Sunflower**

Nectar plants for hummingbirds

Hummingbirds are typically attracted to red and yellow tubular flowers, although they frequently visit others as well.
Bee balm
Columbine
*Delphinium**
Fuchsia
Jewelweed
Lobelia
Native honeysuckle
Penstemon
Phlox
*Salvia**
*Trumpet creeper**

Additional food and shelter for birds

You can provide additional food and shelter for birds and other wildlife by building or purchasing feeders and houses and by setting out certain foods. Watching birds feeding can be an enjoyable pastime. Find out which birds **spend the winter** in or **migrate through your area,** and provide food for them. Check to see which birds are most common and which are rare or in special need of food and shelter. Many species of birds can be attracted by a **variety of feed** in different styles of feeders. Be sure to put feeders **out of reach of predators.**

Common food for birds

Hummingbird:
Sugar water (1 part sugar to 4 parts water) in a feeder. Every 3-4 days, wash feeder with a little bleach and water, rinse thoroughly, and add new sugar water.

Oriole:
Citrus fruit on a nail

Titmouse, nuthatch, chickadee, and many others:
Black oil sunflower seeds

Goldfinch, pine siskin:
Thistle seed

Woodpecker, wren:
Plain suet in a suet feeder

Note: *Use of feeders could attract some wildlife species that you may not want to feed, such as starlings, crows, and squirrels. Type and placement of feeders and the type of food can help deter unwanted species.*

Birdhouses

Choose a location that birds will find **appealing and secure,** usually away from the bustle of human activity. Make or buy a birdhouse **specifically designed** for the species of bird you want to attract. The size of the hole is most critical to prevent the eggs and young from being destroyed by larger birds; always check a list of appropriate hole sizes.

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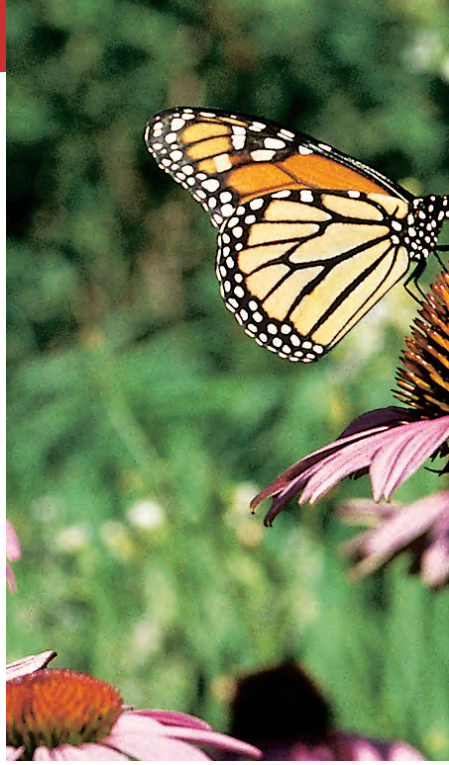


Attracting butterflies to your yard

Colorful butterflies add beauty and interest to your backyard. There are hundreds of different species of butterflies in North America. Butterflies require food in liquid form, such as nectar produced by plants. They get some of it from flowers and from juices of extra-ripe fruits. The types of **flowering plants** you grow will determine the kinds of butterflies you will attract to your backyard. Observe species nearby, and use plants that attract them. Provide **nectar-rich flowers** for adult butterflies and foliage for caterpillars. Do not use insecticides near plants for butterflies.

Stephen L. Buchmann

Nectar plants for butterflies

Aster
Azalea
*Butterfly bush**
Butterfly weed and other milkweeds
Coneflower
*Lantana**
Lupine
Phlox
Zinnia

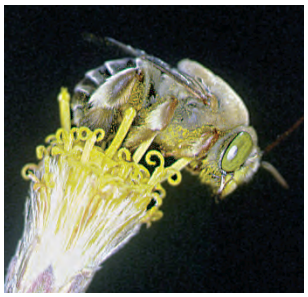
Plants for caterpillars

Caterpillars, the larval stage of butterflies, need nourishment as well. Plants for caterpillars include:

Aspen
Birch
Butterfly weed and other milkweeds
Dill
Hollyhock
Senna
Sorrel
Spicebush
Willow

Dead, dying, and hollow trees and logs

Many people are not aware of the value of dead, dying, and hollow trees, as well as logs on the ground, for wildlife. Dead trees provide homes to over 400 species of birds, mammals, and amphibians. Fish, insects, plants, and fungi also benefit from dead and dying trees. Consider leaving standing dead and dying trees in your yard unless they pose a human safety or property hazard, and use downed woody materials in gardens and landscaping.



Stephen L. Buchmann

Attracting bees to your yard

In the United States, there are nearly 5,000 different species of native bees—almost all of them **solitary bees** that nest in holes in the ground or burrows in twigs and dead tree limbs. These bees don't have hives to protect so they are **not aggressive** and rarely sting. Bumblebees, carpenter bees, sweat bees, leafcutter bees, digger bees, and others **pollinate many different kinds of plants,** and play a critical role in healthy wild plant communities and gardens. Some 30 percent of our diet is the direct result of pollinating visits by bees to flowering fruit trees and vegetable plants. Providing bee habitat

Lynn Betts, USDA

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(top) *Monarch butterfly on coneflower;* (bottom right) *Digger bee;* (left) *Giant swallowtail after emerging from chrysalis.*

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(top right) *Canada Goose;* (bottom) *Egret over wetland;* (left) *Pallid bat with insect.*

in your yard can increase the quality and quantity of your fruit and vegetable harvests.

Nectar plants for bees

Bees are attracted to most flowering plants, and are especially fond of blue and yellow flowers. Try planting your garden so you have **different species blooming in the spring, summer, and fall.** Plants for bees include:

Bee balm
*Black-eyed Susan**
Cardinal flower
*Clover and other legumes**
*Cosmos**
Crape myrtle
Goldenrod
Lupine
Mallow
Milkweed
Mint
*Sunflower**

*This plant could become invasive in some areas. Please check with a local authority (see back cover) to determine whether it is potentially invasive where you live.

Bee houses

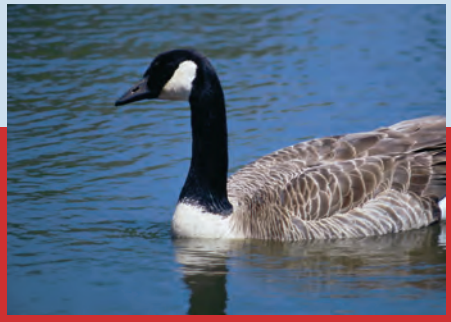
A good use for **scrap lumber** (at least 3 to 5 inches thick) is to drill holes (from 1/8-inch to 5/16-inch in diameter) about 90 percent of the way into the thick wooden block. Space the holes about 1/2-inch to 3/4-inch apart. The 5/16-inch holes work best as homes for orchard bees, which are excellent pollinators of fruit trees. Hang your bee blocks **under the eaves** of your house or garden shed, protected from direct sun and rain.

Merlin D. Tuttle, Bat Conservation International

Attracting bats to your yard

Bats can be beneficial and interesting mammalian species in your neighborhood. Bats are among the most important consumers of **night-flying insects,** including mosquitoes, moths, and beetles. For example, a single little brown bat can catch more than **600 mosquitoes in an hour.** Watching bats

On corporate lands



Bill Welker, USDA

Some corporate lands are set aside and managed just for wildlife habitat. Through Wildlife Habitat Council-assisted projects, more than 2.4 million acres in 48 States, Puerto Rico, and 16 other countries are managed for wildlife.

Habitat projects on corporate lands are corporate-driven cooperative efforts among management, employees, the community, local conservation groups, and local, State, and Federal agencies.

Lynn Betts, USDA

fly around light posts catching bugs can be an interesting nighttime activity.

To help attract bats and provide them with much-needed roosting habitat, you may want to consider putting a bat house in your yard. The houses should be placed on **poles or buildings at least 15 feet high** in a spot that receives 6 or more hours of sun per day. Tree trunks are usually too shady for bat boxes. Some species, such as red bats and hoary bats, will use foliage of shrubs and trees, while others, such as evening and Indiana bats, will roost under loose bark or in cavities.

As with all wildlife, bats should be **watched but not handled** or chased. Bats are generally shy of humans, and rarely "attack" or fly after a person, but if caught or picked up from the ground, a bat may bite in self-defense. Keep a respectful distance from all bats.

Maslowski Wildlife Productions

Water for wildlife

Clean, fresh water is as important to birds, bats, and other wildlife as it is for people. Water in a **saucer, bird bath, or backyard pond** gives wildlife the water they need. Remember to change the water every few days to **keep it fresh.** In hot weather, it may be necessary to refill the container every day.

Logs, rocks, and other in-water structures provide drinking and basking habitat for turtles, butterflies, and songbirds. Stones with depressions that collect water will help attract butterflies.

Reduce chemicals

Butterflies, birds, bees, and all wildlife are very vulnerable to many pesticides and other chemicals. Probably the best single thing a gardener can do for wildlife is to **minimize chemical use.** If you use chemicals, always **follow label instructions.**

Lynn Betts, USDA

Ron Nichols, USDA

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(top) *Backyard pond with lily pads and frogs;* (bottom) *Cleaning birdbath;* (left) *Thistle feeder with American Goldfinches.*

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(top right) *Eastern Bluebird, male;* (bottom right) *Streamside buffer of trees and other plants;* (bottom left) *Red-eared and painted turtles;* (top left) *A backyard pond.*

Maggie Strucker

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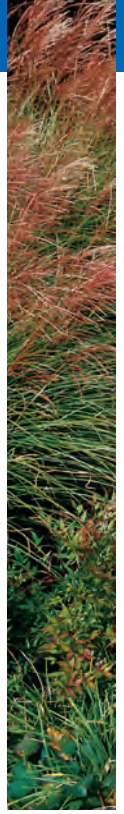
On the farm

Farmers are installing grass, tree, and shrub plantings; ponds; and other wildlife habitat at record rates. Buffer strips along waterways, grass areas, and native prairie plantings are some of the practices used on farms. Nesting structures such as bird and bat houses are sometimes provided for wildlife. Some farmers plant or leave food plots of corn, millet, or other grains specifically for wildlife.

Pheasants, grouse, quail, prairie chickens, and songbirds, as well as leopard frogs, diamond-back terrapin, red bats, and other wildlife, benefit from habitat that farmers and ranchers establish on their land. Farmers appreciate and enjoy wildlife supported by good habitat and also benefit from pollination and pest control by beneficial insects.

Lynn Betts, USDA

Lynn Betts, USDA



A backyard pond will likely become the focal point for all your backyard conservation.

In your backyard

Backyard ponds are for birds, butterflies, frogs, fish, and you and your family. These ponds are typically small, sometimes no larger than 3 to 4 feet in diameter. Water is very effective in **drawing wildlife** to your backyard. It is also a natural, relaxing, and scenic addition that can provide interest and enjoyment.

Jim Archambeault

Where to put a backyard pond

Consider locating your backyard pond in view of a deck or patio where everyone can enjoy it. Have it blend in with its natural surroundings. Plan to **landscape around the pond** to provide habitat for frogs and birds that need land and water. Be sure electrical service is available for a pump, filter system to keep water fresh, or for lighting. There will be less maintenance and cleanup and most aquatic plants will grow better if your pond is not under trees.

When to install a backyard pond

You can put in a backyard pond any time the ground isn't frozen or overly wet. Plan on taking at least a weekend to install and landscape.

Backyard pond supplies

Most sites will require lining with an impervious material to hold a constant water level. A **flexible liner** made of sheets of strong plastic is generally the easiest way to line your pond. Flexible liners may make it easier for the pond to fit into the natural surroundings of your yard. Pre-formed rigid liners also are available, but generally are more expensive and more difficult to install. A wooden half barrel with a liner makes a nice small, above-ground pond. You'll also need a **pump and filter** to maintain clean water and healthy fish. You can add plants, landscaping, heaters, or special effects like fountains and waterfalls.

Size and depth

Common regrets of backyard pond owners are that the pond was too small or too shallow. Minimum depth for fish is 18 inches; a deep end of 2 or 3 feet is recommended. Size and shape of ponds with rigid liners are dictated by the liners. A pond with a flexible liner may be any shape or size.

Establishing plants

Free-floating plants are an integral part of keeping the water in your pond clear. Use native plants that are recommended for your area.

Jim Archambeault

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Recirculating water in backyard pond.

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(top) *Landscaped backyard pond;* (right) *Fishing in farm pond;* (left) *Your "pond" may be as simple as a birdbath.*

Lynn Betts, USDA

Also use **submerged pots** of water lilies, iris, spikerush, arrow-arum, duck potato, marsh marigold, and other native wetland plants. **Natives are hardy** and typically survive over winter in the backyard pond, unlike most non-native, tropical species.

Plants should cover 50 to 70 percent of the water surface. Set the plants 1 to 2 inches under water; the pots may need to be supported by submerged rocks or bricks. If you are using native plants, there is usually no need to fertilize them. For some exotic water lilies, limited fertilizing—once yearly—may be required. Check with your nursery on care of plants and how deep to place potted plants. Be aware that overfertilizing may cause unwanted algae blooms, which can rob the water of oxygen.

Add fish and scavengers

Consider stocking your backyard pond with fish. They are fun to watch, and help keep the pond free of unwanted insects. You'll also need scavengers, such as aquatic snails and tadpoles, to help control algae. In cold climates, a heater may be necessary for fish to survive the winter. Be aware that heaters can use large amounts of electricity.

For small visitors

Fill a small area with sand or gravel to create a shallow area where bees and butterflies can drink.

Safety

Locate the backyard pond where it is unlikely that unattended children or pets may be attracted to it. Check local safety ordinances to determine if a fence is required for the specific depth and size of your pond. Check local building ordinances for depth and safety restrictions and permits. Equip outdoor outlets with a ground-fault circuit interrupter.

More help

Your local nursery, landscaper, or other supplier can give you more information on the step-by-step process of building a backyard pond, selecting and establishing suitable plants in and around it, and landscaping.

On the farm

A properly located and maintained farm pond can help stop gully erosion and improve water quality. Ponds provide water for livestock, waterfowl, and fish; store water for emergencies; and add beauty to the landscape.

Wildlife use ponds for water and habitat. As one Iowa farmer says about his pond, "I was always taught that one generation does for the next, and we thought leaving the land and water in better condition would be something good to leave to our children and grandchildren."

Tim McCabe, USDA

Wetlands filter excess nutrients, chemicals, and sediment, and provide habitat for a host of interesting creatures.

Gene Whitaker

In your backyard

Many yards can support a backyard wetland that benefits you and your community. Letting runoff from your roof, parking area, and lot slowly filter through a mini-wetland helps prevent pollution of neighboring creeks and may help prevent flooding.

Where to put a wetland

Low areas that remain wet or damp much of the year are the easiest places to establish wetlands. Any **depression that collects rainwater** or runoff from downspouts, or serves as the path of drainwater leaving your yard, is an excellent spot to **plant wetland plants.** You'll create a backyard wetland area that will be very **low maintenance.** There will be no more "bogged down" lawn mowers because no mowing will be needed! The area will attract wildlife and filter the water draining off your property. If you do not have an appropriate natural site, you can create a wetland the same way you would a backyard pond. Do not put excess fertilizer or pesticides on your lawn or other areas feeding your wetland.

How to build a wetland

Partially blocking an existing drainage way or digging a shallow basin may be all you need to do if you have clay soil that naturally holds water. In better drained soil or where you want your wetland to stay wet most of the time, you can dig a shallow depression and bury a plastic liner as you would to create a backyard pond. How long the area stays flooded or wet during the growing season is key to the types of plants to use. If runoff will not naturally keep the area wet enough, you will need to have a supply of water available for occasional use.

Ken Hammond, USDA

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Wetland plants in low area between buildings.

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(top) *Wet area below a spring grows wetland plants;* (right) *Common Yellowthroat, male;* (bottom) *Restored prairie pothole wetland.*

© Janet Zinn

Important! Because of the variety of potential conditions that you can create, and the potential side-effects of blocking drainage ways, you should always consult an expert before starting a wetland project.

What to plant

A wide variety of attractive plants can grow in wet areas. Cattails and many varieties of reeds thrive in the open sun and are easy to care for. Many species are not harmed by long dry periods during the summer. Cardinal flowers, sweet flag, and pickerel weed thrive in wet areas. Trees and shrubs like black gum, water oak, red-osier dogwood, button bush, and sweet pepper bush **add texture, color, and beauty** to any landscape, and are adapted to poorly drained soil. A variety of attractive ferns, skunk cabbage, and Jack-in-the-pulpit grow well in wooded wetlands that are damp and shaded. If you create bog conditions of permanently damp organic soil, you can grow native orchids, Venus flytrap, and sundew.

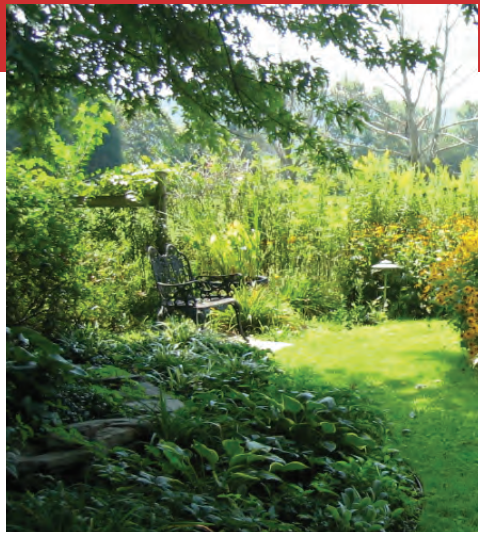
Wildlife in your wetland

Many birds and small animals will quickly start using your wetland. Usually frogs, toads, salamanders, and aquatic insects will find your wetland during the first spring. A deep, permanent pool in the wetland can support native frogs, toads, and possibly fish that will eat mosquito larva and other insects. Most frogs and toads need spring pools in which to breed; their tadpoles need shallow water for several weeks while they mature. Wetlands that dry out in the summer can support a variety of plants and wildlife and will not produce mosquitoes.

On the farm

Wetlands filter excess nutrients, chemicals, and sediment from runoff, keep ground water pure, hold back flood waters, provide habitat for migratory birds and local wildlife, and add beauty to the landscape. Across the country, many farmers are restoring wet areas in cropland and pasture to fully functioning wetlands that benefit their land and the environment.

Tim McCabe, USDA



Composting turns household wastes into valuable fertilizer.

Lynn Betts, USDA

In your backyard

All organic matter eventually decomposes. Composting speeds the process by providing an ideal environment for bacteria and other decomposing micro-organisms. The final product, humus or compost, **looks and feels like fertile garden soil.** This dark, crumbly, earthy-smelling stuff works wonders on all kinds of soil and provides vital nutrients to help plants grow and look better.

Decomposing micro-organisms need four key elements to thrive: nitrogen, carbon, moisture, and oxygen. For best results, **mix materials high in nitrogen** (such as clover and fresh grass clippings) **and those high in carbon** (such as dried leaves and twigs). If there is not a good supply of nitrogen-rich material, a handful of general lawn fertilizer will help the nitrogen-carbon ratio. Moisture is provided by rain, but you may need to **water or cover the pile to keep it damp.** Be careful not to saturate the pile. Oxygen is supplied by **turning or mixing** the pile. More turning yields faster decomposition.

Getting started

Many materials can be added to a compost pile, including leaves, grass clippings, straw, woody brush, vegetable and fruit scraps, coffee grounds, livestock manure, sawdust, and shredded paper. Avoid using diseased plants, meat scraps that may attract animals, and dog or cat manure, which can carry disease.

Composting can be as simple or as involved as you would like, and depends on how much yard waste you have, how fast you want results, and the effort you're willing to invest.

Cold composting

With cold composting, you can just pile grass clippings and dry leaves on the ground or in a bin. This method requires no maintenance, but you'll have to wait several months to a year for the pile to decompose. Cold composting works well if you're short on time or have little yard waste. Keep weeds and diseased plants out of the mix. Add yard waste as it accumulates.

Maggie Strucker

Previous Page
Nutrient-rich compost

This Page
(top) *A healthy backyard;* (top right) *Finished compost;* (bottom right) *Finished compost showing crumbly structure;* (bottom) *Manure storage tank.*

Hot composting

Hot composting requires more work, but with a few minutes a day and the right ingredients you can have finished compost in a few weeks. Hot piles must be built all at once in a 4- to 5-foot cube and turned regularly. As decomposition occurs, the pile will shrink. A 3-foot cube is needed to maintain necessary heat. Hot piles can reach 110 to 160 degrees Fahrenheit, killing most weed seeds and plant diseases.

- On a level site, lay down bricks or prunings to promote air circulation.
- Spread several inches of the high-carbon material, then mix high-carbon and high-nitrogen material together. Water periodically.
- Punch holes in the sides of the pile for aeration.
- The pile will heat up and then begin to cool. Start turning when the pile's temperature begins to drop.

Move materials from the center to the outside and vice versa. Turn every day or two and you should get compost in less than 4 weeks. Turning every other week will give compost in 1 to 3 months. Finished compost will smell sweet and be cool and crumbly to the touch.

Steven J. Saffier

Steven J. Saffier

On the farm

Lynn Betts, USDA

Like composting, waste management on the farm turns a potential waste into a resource that saves money and helps the environment.

Producers use livestock manure to fertilize crops. When manure is properly handled, it can be safely applied to the land without the risk of polluting water.

Composting is also practiced in some poultry operations. The compost is used as fertilizer on the farms and for lawns and gardens.

Mulching cools, protects, and enriches the soil.

In your backyard

Mulching involves placing a layer of organic material around plants. As mulch decomposes, it adds organic matter to the soil. This provides important nutrients for plants and an ideal environment for earthworms and other organisms that help **enrich the soil.**

Mulching can recycle yard wastes and improve your soil. Mulch **protects soil from erosion,** prevents weed growth, conserves soil moisture, stabilizes soil temperature, reduces compaction, and keeps clean and dry any fruit or vegetable that touches the ground.

Mulch materials

The best place to look for mulch materials is in your own yard. **Grass clippings and leaves** work well for mulching if they are dry and weed free. Avoid adding clippings to your vegetable garden from lawns that have been treated with weed killer within the last two mowings. If you live near farming areas, you may be able to get old hay from a farmer or feed store.

Compost makes an excellent organic mulch material. It adds nutrients to the soil and has a natural appearance. Wood chips and bark work well around trees and shrubs and make attractive walkways through gardens.

Applying mulch

Apply mulch **when plants are established and soil is warm.** First, water your garden well. Then place a layer of mulch around the plants. Thickness of the mulch layer varies for each material:

Dry grass clippings	2 inches
Shredded hardwood mulch, straw, or wood chips	2 to 4 inches
Compost	3 to 4 inches
Dry leaves	6 inches

June Davidek, USDA

You will help insulate the root zone and lower evaporation rates if you liberally apply mulch. Be careful not to smother the plants. As the mulch breaks down, add more material to the top throughout the growing season. After harvest, **work the mulch into the soil** to integrate the organic matter, or leave it on the surface to **decay naturally** and be carried into the soil by earthworms.

On the farm

Gene Alexander, USDA

Leaving the previous year's crop stubble on the soil surface is called conservation tillage. This practice helps keep wind from blowing soil particles and helps stop rain from washing soil away. Also, research is showing that leaving crop residues helps hold carbon in the soil and aids in reducing greenhouse gases. This practice is often used in combination with other conservation measures such as wind strips or contour farming.

Apply only those nutrients the plants can use.

In your backyard

Nutrients are essential for good plant growth, but overapplying nutrients is not good for plants or for the environment. Excess nutrients leach through the soil and end up in ground water, or run off into storm sewers and end up choking a lake or stream.

Amy Janssen Smith, USDA

The three primary plant nutrients are nitrogen, phosphorus, and potassium. Generally, nitrogen promotes top growth, phosphorus helps develop stronger roots and more flower and fruit production, and potassium builds durability and disease resistance.

Remember to **consider native plants** or others with low fertilizer needs.

Soil test is key

The key to good nutrient management on the farm and in your backyard is a reliable soil test. Without a soil test, you could be applying too much, too little, or the wrong nutrients. You'll want a separate soil test for your lawn and for your garden.

Commercial soil test kits are available at nurseries and lawn and garden suppliers. Ask for information on how to take your soil samples. Apply **only the nutrients needed** according to the soil test, and at the right time. Never exceed the recommended rate.

Fertilizing lawns

- Use slow-release nitrogen fertilizers.
- Mow often, and leave grass clippings on the lawn for fertilizer.
- Be careful not to spread fertilizer on sidewalks and driveways.
- Be sure to calibrate your spreader correctly.

Fertilizing gardens

- Use compost to enhance or replace fertilizers.
- Choose a level site, or terrace the garden, to avoid runoff and erosion.
- Place fertilizer near plants rather than broadcast it over the entire garden.
- Add organic matter to the soil by using manures and organic fertilizers at a conservative rate.

Lynn Betts, USDA

On the farm

PREVIOUS PAGE
(top) *Applying shredded mulch;* (bottom) *Soybeans growing through corn residue.*

THIS PAGE
(top right) *Using soil test kit in yard;* (bottom) *Testing soil on the farm;* (top left) *Curbside runoff drains to lake.*

Agricultural producers sample soils for nutrient needs. As technology becomes available and affordable, more producers are varying fertilizer rates within each field, depending on soil test results. This precision farming method places the correct amount of fertilizer where it is needed. Applying only those nutrients plants can use improves the farm economically and environmentally.

Lynn Betts, USDA

Terracing makes flower and vegetable gardening possible on steep slopes.

Ron Nichols, USDA

In your backyard

Terraces can break your backyard into several mini-gardens. On steep slopes, terracing can make planting a garden feasible. Terraces prevent erosion by shortening the long slope into a series of shorter, more level steps. This allows heavy rains to **soak in rather than run off** and cause soil erosion.

Materials for terraces

Building terraces is like building a staircase. The material you use to make the face of the stair may be treated lumber—such as railroad ties, poles, or posts—or bricks, rocks, concrete blocks, or similar materials.

Height of walls

The steepness of the slope often dictates wall height. Make the terraces in your yard high enough so the land area between them is **fairly level.** Be sure the terrace material is **strong** enough and **anchored well** enough to stay in place through freezing and thawing, rainstorms, and so forth. Large projects, such as retaining walls, may require a professional design and specialized assistance and equipment. Be sure to **check local building codes** regarding the installation of high walls, and **work safely.**

Erosion control is a consideration

Heavy rains can cause erosion between terraces, and create small gullies if water concentrates as it goes over a terrace. To help prevent erosion, **add mulch or other good ground cover** on land between terraces.

On the farm

Gene Alexander, USDA

Terraces catch runoff water, let the water soak into the ground, and deliver the excess safely to the bottom of a hillside —much like eavespouts on a house. The earthen ridges built around a hillside on the contour cut a long slope into shorter slopes, preventing water from building to a highly erosive force.

Some terraces are seeded to grass, which provides erosion control and a nesting area for birds. Terraces are often used in combination with other conservation practices to provide more complete soil protection.

Drip irrigation and other water conservation practices can save water and money.

Ron Nichols, USDA

PREVIOUS PAGE
(top) *Terraced flowerbeds;* (bottom) *Farming grassed terraces on the contour.*

THIS PAGE
(top) *Drip irrigation in vegetable garden;* (bottom) *Efficient drip irrigation on the farm.*

In your backyard

If you rely on watering to make your lawn grow and your garden productive, consider a more efficient system. There are several ways to improve the use of water.

Use water again

When it rains, if no water recycling system has been planned, the water that runs off your house keeps on going to the storm sewer. By saving that water, and reusing it on your garden or lawn later, you save energy and water.

A simple recycling system directs water from eavespouts to a storage barrel. You fill a bucket with water from the storage barrel and carry the water to your garden. This is a simple and effective system. However, you may want a more elaborate method of capturing and distributing rain water.

Watering to save energy

Whenever practical, **water in the early morning.** In arid climates, it's okay to water in the evenings and at night. You'll lose less water to evaporation than if you watered in the middle of the day, and the plants are less stressed and can take up the water more efficiently.

Mulch or fiber cloth preserves soil moisture. You can find supplies and information at a nursery or hardware store.

Consider planting native species. They usually use little or no water beyond normal rainfall.

Drip irrigation benefits

A drip irrigation system will provide water directly to the plant. You can control the flow to each plant.

Drip irrigation ranges from inexpensive soaker hoses to elaborate computerized systems. There may be an up-front investment, but you'll **use less water and have better water distribution.**

Garden or hardware stores will have the supplies you need. You may even want to engineer your own system from a garden hose. Be sure not to overapply fertilizer when using a drip system.

On the farm

Ron Nichols, USDA

Drip irrigation, commonly used on fruits and vegetables, minimizes the amount of water that evaporates, and it maximizes the amount that is used by plants. By placing the water directly on the plant, or next to it, less water evaporates and less is wasted on bare soil.

High-efficiency irrigation systems for row crops use less energy to pump water and, since they spray water downward, less water evaporates before it reaches the crop. Farmers implement other water management practices to reduce the amount of water used to produce a crop.

Early detection and treatment of pests means a healthier growing environment.

© Chuck Younger

In your backyard

Good planning can put you **a step ahead** of unwanted insects, weeds, and diseases. Healthy, vigorous plants minimize pest damage.

Regular monitoring of your lawn or garden is the best way to stay on top of potential plant health and pest problems. If you see minimal damage, it is often easiest to just tolerate it and continue monitoring. If pests begin to cause serious damage, there are a number of treatment methods.

Lynn Betts, USDA

Preventing pests

- Plant disease- and pest-resistant species.
- Select a variety of hardy plant species and space them properly.
- Select plants that bloom and bear fruit at different times of the year.
- Plant flowers, herbs, and vegetables together and change the location of annuals every year to prevent buildup of certain pests.
- Clean up plant litter and remove weeds before they go to seed.
- Add bird and bat houses to the garden.
- Provide habitat for beneficial insects that prey on pests.
- Water and add nutrients properly to increase plant vigor.

Physical pest control

- Remove insects by hand.
- Wash pests away using a spray nozzle.
- Set traps.
- Make physical barriers around plants, such as a wire mesh fence partially sunk into the ground for rabbits, aluminum foil wrapped around vegetable plants for cutworms, and solid barriers to prevent weeds from invading flower beds or vegetable gardens.

Beneficial insects

Having the right insects in your garden or backyard can keep pests and weeds in check. Beneficial insects, such as ladybugs, assassin bugs, and praying mantises, prey on insects that can harm your plants. The following insects can help control pests in your backyard.

© Janet Zinn

Previous Page
(top left)
Aphids;
(bottom left)
Spot spraying dandelion.

This Page
(top)
Ruby-crowned Kinglet;
(bottom)
Scouting a farm field.

- Ladybugs and lacewing larvae for controlling aphids and a wide variety of other insects.
- Praying mantises for controlling many insects.
- Seedhead weevils and other beetles for controlling weeds.
- Predatory mites for controlling pest mites, thrips, and many others.
- Ground beetles for controlling caterpillars that attack trees and shrubs.

Chemical controls

If the methods listed above fail to solve your pest problem, use chemicals of **low toxicity** and **rapid decomposition.** Always read the label, **follow directions,** wear protective clothing, and spot-spray. Some of these chemicals are:

- Pesticidal soaps for aphids, scale crawlers, whiteflies, and thrips.
- Insecticidal dusts for aphids, beetles, fleas, ticks, ants, and crickets.
- Horticultural oils for aphids, mites, leafhoppers, mealybugs, scales, plant lice, and mosquito larvae.
- Botanicals for leafminers, fleas, and ticks.

Before you apply pesticides, make sure that they will not harm beneficial insects or be hazardous to humans, pets, or wildlife.

Living in harmony with wildlife

In some instances, practices described in this book could attract unwanted wildlife, or more of a species than is desirable. If you have problems with any wildlife species, most nurseries or garden stores and the organizations listed in the "Where To Get Additional Assistance" section at the back of this book can provide information on preventing or controlling them. The government agencies listed can provide information on Federal and State regulations regarding protection of wildlife species. Equipped with the right information and tools, most people are able to solve their own problems and live in harmony with wildlife.

On the farm

Proper pest management on the farm involves a variety of practices, like rotating crops to reduce disease and insect problems, and establishing tall grass hedges to provide habitat for beneficial insects. Most farmers now monitor their fields regularly, a practice called "scouting," to keep track of insect and weed populations. Only when populations reach a level where an unacceptable amount of damage is likely are direct control measures initiated.

Tim McCabe, USDA

When pesticides are necessary, farmers fill and clean tanks away from water sources, mix only necessary amounts, and apply only to land where problems exist.

Backyard practices can be used in shared spaces and public places, too.

In your school or community

Even if you don't have a backyard of your own, there are many opportunities to use the practices in this book to contribute to a healthy environment. Backyard ponds, wetlands, native grass plantings, and plants that attract wildlife can improve school grounds, areas around apartments and businesses, community gardens, parks, and other community areas.

Consider starting a backyard conservation project in your community. Any vacant lot or unused space is a candidate for improvement with natural plantings. A community garden can be a source of pride as well as a source of food. A garden also can be a hands-on teaching center for natural resource conservation concepts.

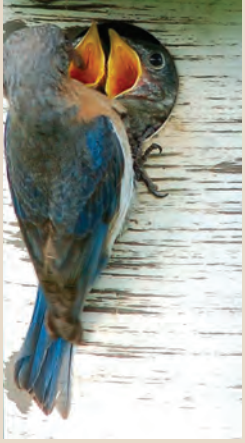
Businesses often sponsor community improvement projects in cooperation with schools and civic organizations, which contribute labor.

Tom Butler

Bob Nichols, USDA

Colleen Schneider, USDA

Lynn Betts, USDA



Wendell Long

Jim Archambeault

Ways to promote backyard conservation in your neighborhood

- Encourage public officials to practice backyard conservation on parks and other public property.
- Plan projects in cooperation with neighboring property owners.
- Encourage community involvement.
- Encourage your building owner to use backyard conservation practices on the grounds around the building.
- Encourage school classes and other organizations to become involved in planning and caring for the areas.

Bob Nichols, USDA

Bob Nichols, USDA

Previous Page
(top) *Restored community wetland;* (center) *Rufous Hummingbird, male;* (bottom) *Urban community garden.*

This Page
(top left) *Planting to enhance community areas;* (top center) *Eastern Bluebird, female, feeding young;* (top right) *Mulch of grass clippings on vegetable garden;* (bottom right) *Arboretums and parks foster interest in gardening, horticulture, and environmental issues;* (bottom left) *Fun and learning in a school garden.*

Where To Get Additional Assistance

Issued February 1998
Revised April 2007
PA-1621

Additional information on backyard conservation is available on the Web at http://www.nrcs.usda.gov/backyard. For more information on the following topics, please contact the organizations listed below:

Audubon At Home

- For information on creating healthy habitats in your backyard and beyond, visit http://www.audubon.org and click on Audubon At Home. To find your nearest Audubon chapter or center, click on States, Centers & Chapters. For more information, write to audubonathome@audubon.org

Backyard conservation practices

- Bat Conservation International
  512-327-9721
  http://www.batcon.org
- Wildlife Habitat Council
  301-588-8994
  E-mail: whc@wildlifehc.org
  http://www.wildlifehc.org
- Your local USDA Service Center (listed in your phone book under U.S. government, Department of Agriculture)
- USDA Natural Resources Conservation Service
  202-720-3210
  http://www.nrcs.usda.gov
- USDA Farm Service Agency
  202-720-9563
  http://www.fsa.usda.gov

Backyard Wildlife Habitat

- National Wildlife Federation
  Backyard Wildlife Habitat Program
  703-438-6000
  http://www.nwf.org/backyardwildlifehabitat/

Developing and managing wildlife habitats and controlling unwanted wildlife

- Your State fish and wildlife agency (listed in your phone book under State government)
- International Association of Fish and Wildlife Agencies
  202-624-7890
  www.iafwa.org
- The Wildlife Services office nearest you (listed in your phone book under U. S. government)
- USDA Animal and Plant Health Inspection Service
  301-734-7921
  http://www.aphis.usda.gov

Horticulture, wildlife, urban forestry

- Your local extension office (listed in your phone book under local government)
- A land-grant university
- Cooperative State Research, Education and Extension Service, USDA
  http://www.csrees.usda.gov
- National Arbor Day Foundation
  888-448-7337
  http://www.arborday.org
- USDA Forest Service
  http://www.fs.fed.us
  202-205-8333
- Your State forester (listed in your phone book under State government)

Locally-led conservation initiatives

- Your local conservation district (listed in your phone book under county government)
- National Association of Conservation Districts
  202-547-6223
  http://www.nacdnet.org

Pollinators, bee gardens

- North American Pollinator Protection Campaign
  415-362-1137
  http://www.pollinator.org
  http://www.nappc.org
- International Sonoran Desert Alliance
  http://www.isdanet.org
- University of California, Berkeley
  http://nature.berkeley.edu/urbanbeegardens
- USDA-ARS Carl Hayden Bee Research Center
  http://gears.tucson.ars.ag.gov

Restoring and protecting wildlife habitat

- Your local U.S. Fish and Wildlife Service office (listed in your phone book under U.S. government, Department of the Interior)
- U.S. Fish and Wildlife Service
  http://www.fws.gov

Watersheds, oceans, and wetlands protection

- U.S. Environmental Protection Agency
  http://www.epa.gov/owow/
  Wetlands Helpline: 1-800-832-7828
  Safe Drinking Water information:
  http://www.epa.gov/safewater

Other sources of information

- Local garden centers
- Landscapers
- Garden clubs
- Native plant societies

NRCS Natural Resources Conservation Service

National Association of Conservation Districts

Audubon

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