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Healthier Yards...

Healthier Neighborhoods...

Healthier Habitats

Our backyards are our private spaces. They are our pieces of the world. But a backyard is also part of a larger landscape we share with our community and with plants and wildlife. The health and well being of all of us depends on having a clean, healthy, sustainable place to live. How we take care of our yards and properties—the water and other resources we use, the fertilizer and pesticides we apply, the type of plants and landscape features we choose—impacts the health and quality of our living space, as well as that of our human and wildlife neighbors. Healthier yards for our families mean healthier neighborhoods for our community, and healthier habitats for all living things.

No matter how small, our yards and properties are becoming more and more important as wildlife habitat. Loss, fragmentation, and degradation of suitable habitat are the leading causes of population declines in birds, other wildlife, and plants. With nearly 80 percent of the wildlife habitat in the United States occurring on private lands¹ and an average of 2.1 million acres converted to residential use every year,² our backyard habitats are critically important pieces holding together an increasingly fragmented landscape. Our garden and landscape choices directly affect the health of that habitat for ourselves and for the naturally occurring wildlife and plants that must depend on it to a larger and larger extent.

Our actions at home are also intimately connected to the health and quality of our larger environment—our local ecosystems, our watersheds, our regional landscapes, and beyond. Whether we live ten feet or ten miles from the nearest stream, river, or coast, everything that washes off our terrace, driveway, lawn, or garden has the potential to make its way eventually into local surface waters. Any pesticides, fertilizers, yard waste, engine oil, lawn mower fuel, and other substances that fall in our yards can contaminate local rivers, streams, lakes, estuaries, and coastal waters. Some also may contaminate soils, or even reach underground aquifers and contaminate groundwater supplies. Consider also that many plant species introduced as ornamentals for home gardens have escaped cultivation, displacing native plants and threatening natural ecosystems nationwide. Our stewardship of our piece of the world has ramifications around the world—literally.

We Can Make a Difference!

Most of us envision a typical yard as a mowed lawn bordered by an assortment of shrubs, trees, and flowers that are readily available at the local garden center or nursery. Whether we live in the desert southwest, temperate northeast, or somewhere in between, such a landscape is widespread and familiar. Less familiar to many of us is the price that we pay, directly and

¹ Natural Resources Conservation Service, 1996

² Vesterby & Krupa, 2001

indirectly, to create and maintain such a yard. Homeowners pay a price in time and money, and we all pay in reduced water supply, deteriorating water quality, and the loss of critically important wildlife habitat.

Many homeowners apply large amounts of pesticides, water, and fertilizers to their lawns in an attempt to keep them weed-free and perpetually green. A turf monoculture has essentially no value as wildlife habitat. The plants commonly available at garden centers and nurseries are typically exotic ornamentals – plants that may or may not provide the food and cover required by native wildlife and that can, if they are invasive, undermine or even displace native plant communities.

In every backyard and on every property, there's the potential to create healthier habitat. Simple actions—conserving water, reducing our use of pesticides, planting native species—can lead to measurable improvements in environmental health and habitat quality. Long-term success depends on all of us taking an active role in conservation—in simple ways, in everyday life, in our own backyards.

Water Conservation is Crucial

The widespread shortage of clean water has been named the biggest environmental issue we face in the 21st century.³ What we plant and how we landscape directly influence our outdoor water needs—and our potential for wasting water. Lawns require two-and-a-half to four times more water than shrubs and trees.⁴ Native plants, adapted to local climatic and hydrologic conditions, generally do not need the supplementary watering that exotic ornamentals require. Perhaps less apparent is the substantial effect that our gardening and landscaping choices have on the amount of water that runs off our land instead of seeping down to recharge groundwater supplies. A typical city block generates about nine times more runoff than a wooded area of the same size,⁵ while a half-acre suburban lot generates about three times more runoff.⁶ Plant choice, landscaping materials, and general soil health can make an enormous difference in whether our aquifers get recharged.

Water lost as runoff diminishes the quantity of our water supply and also its quality. Pesticides and fertilizers applied unnecessarily or improperly to our lawns and gardens often contribute to water quality problems. The 2000 National Water Quality Inventory⁷ reports that 39 percent of assessed rivers and streams, 45 percent of assessed lakes, ponds, and reservoirs, and 51 percent of assessed estuaries in the U.S. are polluted. Urban runoff contributes heavily to these water quality problems. It is the largest source of water quality impairment after sewage treatment plant discharges in surveyed estuaries, and it is the third largest source of impairment (after agricultural runoff and hydrologic modifications) in surveyed lakes, ponds, and reservoirs.

A United States Geological Survey analysis of 20 major river basins and aquifer systems⁸ reports that complex mixtures of nutrients and pesticides are “almost always” (*p. 6*) found in the streams and groundwater of areas with significant agricultural or urban development. It also found “a widespread

³ United States Environmental Protection Agency, 2002a

⁴ American Water Works Association, 2001

⁵ US EPA, 1996

⁶ Kelly, Kidwell, & Lehrer, 1998

⁷ US EPA, 2002b

⁸ United States Geological Survey, 1999

occurrence of some insecticides commonly used around homes and gardens and in commercial and public areas. In fact, these insecticides occurred at high frequencies, and usually at higher concentrations, in urban streams than in agricultural streams” (p. 10). The report goes on to say that nitrogen and phosphorous (fertilizer components) concentrations in streams “commonly exceed” (p. 6) levels that can contribute to excessive growth of algae and other aquatic plants, and that “almost every urban stream sampled had concentrations of insecticides that exceeded at least one (water quality) guideline” (p. 10).

Sobering Facts About Lawn and Garden Pesticide Use

Lawn and garden pesticide use is widespread and growing. Homeowners apply an estimated 78 million pounds of insecticides, herbicides, and fungicides per year to their homes, lawns, and gardens—not including applications made by pest control or lawn care professionals.⁹ Approximately half of all U.S. households treat their yards with some sort of lawn or garden pesticide alone (professional or do-it-yourself applications).¹⁰ United States households use greater quantities of herbicide than of any other pesticide, with over 50 percent more herbicides used in 1999 than in 1979. Between 1998 and 1999 alone (most recent data), the amount of herbicides applied by homeowners jumped by five million pounds—an increase of ten percent.¹¹

Of even greater concern is that pesticides are often applied unnecessarily, unknowingly or because the user does not know of healthier pest control alternatives. According to a recent, peer-reviewed analysis of outdoor residential pesticide use, a sizable number of households “apply more than recommended doses,” “treat symptoms of pest problems without suitable information about the causes,” and “do not read pesticide labels, follow the directions, or obtain information about precautions and proper uses against specific pests when reading labels.”¹²

Some consumers do not always realize when they are using a pesticide product. “Weed and feed” products, which contain herbicides as well as fertilizers, are particular sources of confusion. In one residential survey of lawn care practices, 63 percent of 981 residents in one watershed reported using “weed and feed” products, but only 24 percent realized that they were actually applying herbicides.¹³

Surveys indicate that the general public recognizes that there are risks associated with the use of pesticides. Despite this, however, many people continue to use them because they are not aware of healthier pest control options.¹⁴ Lawn and garden pesticides should be used only as a last resort, and then consciously, carefully, and correctly. Pesticide users must read pesticide product labels and seek help if they do not understand how to properly use a product, dispose of unused product, or dispose of empty product containers. Use and disposal advice can be found through Cooperative Extension Services, the National Pesticide Information Service, and elsewhere (see Resource section, p. 44).

We need to recognize that any pesticide may kill beneficial and non-pest species, may not stay where we apply it, and may persist in the environment for years.

⁹ Donaldson, Kiely, & Grube, 2002

¹⁰ Templeton, Zilberman, & Yoo, 1998

¹¹ Donaldson et al., 2002

¹² Templeton et al., 1998, p. 420A

¹³ Schueler & Swann, 2000

¹⁴ Templeton et al., 1998; Whitford, 1993

Birds, butterflies, honeybees, lady beetles, earthworms, and many other organisms are frequently the unintended victims of lawn and garden pesticide use. Pets and children are also exposed to potential health problems. In a recent University of Washington study of pesticide exposure among children living in Seattle, traces of garden chemicals were found in 99 percent of the 110 children tested. Significantly higher concentrations were found in children whose parents reported using pesticides in their gardens.¹⁵

As discussed above, commonly used lawn and garden pesticides are routinely found in surface and groundwater throughout the country. Many can also persist in soil and garden litter, and can be carried on our feet into our homes.

The environmental and health risks directly associated with exposure to low-level concentrations of pesticides are still not clear. There is, however, emerging concern that some pesticides pose a threat at even very low concentrations. Two recent articles in the *Proceedings of the National Academy of Sciences* independently report that gross developmental abnormalities in frogs were associated with extremely low concentrations of commonly used pesticides, atrazine in one study,¹⁶ atrazine and malathion in the second.¹⁷ The concentrations that deformed the frogs were lower than those the EPA considers safe for drinking water. Atrazine is among the most widely used herbicides in agriculture, and it is also registered for weed control on residential lawns, golf courses, sod farms, and other non-agricultural areas. Malathion is a nonsystemic, broad-spectrum organophosphate insecticide. It is registered for use on dozens of agricultural crops and for many non-agricultural uses, including residential use. It is also used for mosquito control.

Compounding the health and environmental risks of widespread pesticide contamination is the fact that pesticides are often found in complex mixtures in the environment. Over ten percent of the urban streams sampled in the USGS study cited above contained “a mixture of the insecticides diazinon and chloropyrifos, along with at least four other herbicides.” There is as yet considerable uncertainty regarding the nature and magnitude of the risks and impacts associated with multiple pesticides occurring together in the environment.

Nurture Your Natives

Long-term environmental protection depends on restoring and maintaining healthy, functioning, natural ecosystems. Development and other human activities have fragmented landscapes to the detriment of biodiversity and natural processes. By planting native plants, we can help counter the effects of fragmentation by maintaining these basic ecosystem building blocks, and the birds, butterflies, and other wildlife that they attract and support. As the area of our native plantings increases in size, and as their structure and composition more closely mimic that of naturally occurring native habitat, our yard and neighborhood gardens serve as critical pieces holding together our increasingly fragmented landscape. An effective conservation strategy must not only protect high-quality natural areas but also must involve buffering and connecting those areas. Using more native plants in our landscapes is an important first step toward implementing this strategy.

Native plants offer additional benefits to home and community landscapes.

¹⁵ Lu, Knutson, Fisker-Andersen, & Fenske, 2002

¹⁶ Hayes et al., 2002

¹⁷ Kiesecker, 2002

Since native plants have evolved in response to local environmental conditions, they seldom need additional water and fertilizers once they are established. For the same reason, they can better resist and recover from pest infestations and therefore rarely need pesticide treatment. The dense, deep root systems of many natives make them effective for erosion control and filtering of contaminated runoff. These environmental advantages—water savings, pesticide elimination, erosion control, pollution prevention—translate into time and cost savings as well. To imagine your savings, just think about the lowered maintenance costs and time associated with native plantings and natural landscapes—less mowing (and fuel), watering, replanting of annuals, pest control, and fertilizing.

Perhaps the greatest benefits of planting native plants are most difficult to quantify—the beauty, sense of place, and portal to nature they offer. Native plants can reconnect us with the natural world everyday and in our own backyard. Discovering their changing textures, scents, and hues with changes in daylight and seasons, noticing how birds and insects visit and use them, learning their flowering and fruiting cycles—all these provide opportunities to explore and reconnect with our natural world. With increasing familiarity comes an increasing sense of stewardship. Our native plants are part of our unique local natural heritage—a heritage we need to protect and preserve. In an era of increasing landscape homogenization, preservation and recreation of this natural heritage can be immensely satisfying and fulfilling.



Evict Your Invasives

Tens of thousands of plant species have been introduced to the United States over the past centuries. They were brought, intentionally or unintentionally, from around the globe and have become embedded in our culture and landscapes. Many of these non-native plants are valuable agricultural crops (wheat, rice) or beloved elements in our gardens (tulips, peonies). An estimated 5000 species, however, have escaped cultivation and are found growing in the wild (Morse, Kartesz, & Kutner, 1995). “Invasive species” are those non-natives that displace native plants and alter the structure of our natural communities.

Invasive plants infest about 100 million acres in the U.S. and spread 14 percent each year (Babbitt, 1998). Wetlands, forests, and grasslands, no matter how remote or how small, are all under assault. Invasives damage parks, national parks, wildlife refuges, roadsides, and backyards.

Some of our most destructive invasive species (purple loosestrife, kudzu, saltcedar) were first introduced for landscaping purposes as ornamentals, windbreaks, or for erosion control. Despite its widespread recognition as a serious invader of wetlands and its legal designation

as a noxious weed in over 20 states, purple loosestrife continues to be promoted and sold in several states. In part that arises from a failure to recognize that what is non-invasive in one region may be a serious problem in another. In fact, many commonly used and readily available non-native ornamental plants are invasive in certain areas—examples include English ivy, oriental bittersweet, vinca, Norway maple, and Japanese barberry.

Invasive plants are a big problem. As gardeners, consumers, and stewards of our piece of the world, we can do a number of things to help:

- ❖ **Learn which plants are invasive where we live.** Share the information with neighbors, landscapers, and local nurseries.
- ❖ **Do not buy or share invasive plants.**
- ❖ **Remove invasives from our own property.**
- ❖ **Volunteer for invasive control efforts in our community.** Native plant societies, local Audubon chapters, and other groups often have “Pull-Ivy Days” and similar events.

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THE ZIMMERMANS: *Boundless Energy and Endless Ideas*

Ask about anything that grows in their yard, and Neil and Carleen Zimmerman will soon be telling you what it does for birds.

Great clumps of bright red, hardy fuchsia? “Last year, for the first time, we had an Anna’s Hummingbird wintering here. It comes to visit these blossoms when most of the other blooms are gone.” Rhododendrons they inherited when they bought the house? “Birds like to hang out here as a staging area. They use the rhodies to check things out, then move to the bird bath, then to the suet feeders.” A tall, shining red and unpruned screen of photinia ranging across the rear property line? “The small birds travel across the property through the photinia rather than out in the open. Lots of birds forage underneath. It’s a nice hiding spot.”

You get the idea. The Zimmermans are ardent birders, with a 70-species list they’ve identified in their own air space on a city lot in the suburb of Brier, between Seattle and Everett. The backyard sanctuary they have created is non-toxic, low-maintenance, teeming with bird life.

Dead snags, gathered here and there and planted upright in the yard, offer splendid perches for songbirds and insect meals for woodpeckers. A Northwest favorite, the large, noisy Pileated Woodpecker, haunts the Zimmermans’ backyard to feast on the bugs that live in the transplanted snags. So do Downy and Hairy Woodpeckers, and a family of Northern Flickers.

Many of the shrubs flourishing in the backyard sanctuary are throwaways from big landscaping projects. Neil’s a carpenter who works on large commercial buildings, and when the landscaping work begins, “I buddy up to the head landscaper, so when they want to get rid of something they let me know.”

The variety of botanical refugees is impressive. Red and blue huckleberry (bird food producers), red- and yellow-flowering currants (hummingbird attractors), wild-looking Rugosa roses (birds love the rosehips), and a half-dozen other species landed here instead of the county dump.

“Variety’s the main thing. The more variety of plants you have, the greater variety of birds. We were part of the Washington State backyard feeder survey last year and we counted 18 species in just one day.”

The Zimmermans are developing their wildlife haven into plant layers to provide clear sight lines for birding. Closest to their back door are the ground covers and low-growing shrubs: native kinnikinnick, Oregon grape (the short



Neil and Carleen Zimmerman have created an inexpensive backyard sanctuary that is non-toxic, low-maintenance, and teeming with bird life.



Scores of species go for the Zimmermans' homemade feeders. Holes drilled in scrap wood are squeezed full of suet and seed.

kind), salal, and deer fern rescued (with County approval) from a wild area that was about to be bulldozed.

Fronting that lowest layer of plants is a simple and delightful water feature. Birds come to bathe here, where the water trickles musically over a smooth stone channel and falls into a 2-foot by 3-foot pond.

Beginning about halfway from the house to the rear border, you'll find red-flowering currant, serviceberry, scarlet willow, and other medium-height species. All meet the feeding and perching needs of certain groups of birds.

The end farthest from the house offers a shady border of Western red cedar, Oregon wax myrtle and the tall, unrestrained photinia. "The more layers we have the more birds we'll get because different birds like to operate at different layers," Neil explains. "From towhees on the ground, on up to warblers and woodpeckers and Band-tailed Pigeons who like to roost in the tops of the trees."

The layered effect also makes for fine bird sighting from a large breezy sun porch, where Neil and Carleen spend hours watching and making notes on the scores of species their garden attracts.

They had to get rid of the lawn before they could make the wildlife haven they wanted. An easy

choice. "Lawns look great to some people but they're basically sterile. As far as bird life is concerned, they're OK for starlings and crows. But if you want a variety of birds, you need a variety of plants."

The lawn was also home to crane fly maggots, and when the lawn went away, Carleen recalls, the crane fly larva chewed their way through a lobelia border. "Once we took out the lawn, they seemed to think I'd set out a salad bar, and at first they ate everything."

The sight of the unseemly adult crane fly has led thousands of Northwesterners to reach for diazinon. Now banned, diazinon was for years one of the most serious bird killers on the market. Neil and Carleen never used it or any other chemical; still, the crane flies at their place have all but vanished. There's almost no lawn to harbor them, and there's a crowd of hungry birds to go after those few crane flies that persist.

They control aphids with water spray, and Neil sparingly hits a fenceline morning-glory infestation with Roundup. Those are about the only pests they get now that the lawn is nearly gone.

The variety of plants growing where the lawn used to be is a delight to the senses and a blessing to the birds. Blue star creeper, wood sorrel, maidenhair fern, wintergreen, campanula, and evergreen

huckleberry are only a few of the plant species that thrive in a pattern so informal they might have been scattered by a spring breeze.

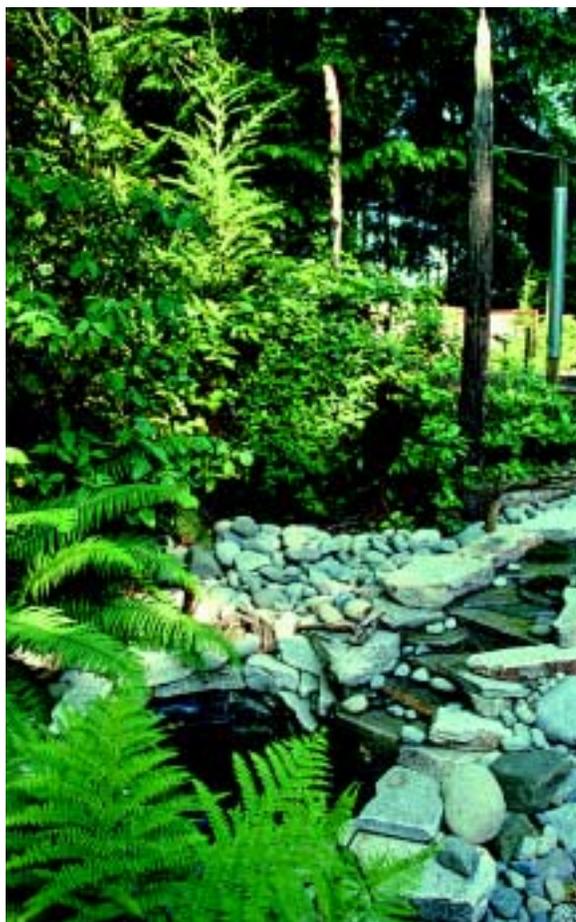
The Zimmermans go native when they can, but they aren't purists. They use several non-native species that have naturalized to the Northwest climate to provide fine bird food and habitat.

One example is pyracantha. This non-native adoptee curves gracefully over the front entrance to the Zimmerman's house. On a fine summer day, it's loaded with scented white flowers. "The birds love the red berries in the fall," Carleen says. "Last year we had eight robins in there cleaning it up, all at the same time."

"Natives are great because they've evolved in this area, they fit the climate and they need hardly any care after the first year," Neil explains. "We've tried to keep an emphasis on those that are at least close to natives. We try to get plants from similar climate zones, so we don't have to be watering constantly."

You can see in a few minutes what the Zimmermans' lawn-to-wildlife conversion has done for the birds. What's in it for the Zimmermans?

- ◆ **Hours of watching and making notes** on the bird life from their comfortable sun porch in summer and a kitchen window in winter.
- ◆ **Free time to do the watching:** "We don't have weeds to pull, don't have grass to cut," Neil says. "We have a couple of projects this summer, but



Wilson's and Townsend's warblers, bushtits and other birds that don't ordinarily come to feeders drop in at the Zimmermans' for a bath.

last year we were sort of walking around looking for jobs to do."

- ◆ **Sharing the avocation, person to person:** "I think that when people see the way you live—that you're living outside even when you're in the house, and when you're out here it's like being in a home—that you end up sharing that when people come," Carleen says. "It becomes an immediate connection, and you interact with people in a different way."

"For us, this has been a way of promoting gardening in a way that would maybe make people think twice about using toxins."



Tearing out a lawn can be mean work. The Zimmermans have the Seattle Times do it for them. They lay down many layers of folded newspaper and then cover it with three inches of soil. The grass dies, the newspaper dissolves into the soil. Planting flowers, shrubs or ground cover is a simple matter of digging a hole through the disintegrating newspaper. However, as Neil points out, their lawn wasn't much to start with. A thicker, heavier turf can require more severe treatment. Some lawn-to-wildlife conversions require cardboard and several inches of wood chips.

FINDING SPACE IN A CITY FOR WILDLIFE HABITAT

Stretch out on one of the old wooden seats on a shady patio of Sandra Dean's backyard. It's a good place to ponder some of the things you don't need.

You don't need a lawn to have a lawn party.

You don't need a big yard to entertain a big group of friends.

You don't need money to create a lovely backyard habitat that's pleasing to both people and wildlife.

This Queen Anne Hill backyard is a lush, welcoming gathering place with various sunny and shady corners, comfortable seating, winding pathways, and cozy "rooms," yet it lies only about ten minutes from downtown Seattle.

Whatever it is that makes friends hang out in a crowded kitchen and ignore a spacious living room works also in Sandra's backyard. "People having a good time don't mind being squeezed a bit," she observes.

What's left of Sandra's lawn is nine feet by nine feet. It serves to extend, into open sunlight, a cloistered patio near the top of the terraced backyard.



Sandra Dean's garden vision is about as far as you can get from flattening, squaring and rolling the land into a lawn and then meeting a lawn's demands with poisons.

Sandra mows the tiny patch with an old-fashioned push mower and likes it. She and her husband, David Bilites, spend no money on the lawn. None.

There used to be a lot more to mow. The whole backyard was lawn.

“The first thing I did when I moved in here was to look at this big open area that was just a squared-off piece of grass, sloping from the kitchen door to the back of the property, and I thought, ‘How uncreative can you get?’ I began tearing it out.”

Uncreative, she is not. She’s an artist whose colored pencil works range from explicit representations of plants to vivid abstractions expressing the energy of plants. She’s also a violinist who, with David, a percussionist, plays wild-sounding traditional Greek music with a group called Pangeo. Their garden looks the way their music sounds, with unrestrained splashes of purple, orange and gold. Bees, butterflies and birds are everywhere.

Their entire lot, from the street to the back fence, is 35 by 80 feet. Maybe a quarter of it is taken up by the front planting area next to the street. Their 1930s cottage (just 850 square feet) takes up another third. Even though Sandra and David have entertained as many as 50 guests at a time, there’s no great spacious area left for outdoor living. It just feels that way.

Settling down on a bench on the six-by-six deck outside the kitchen door, lemonade in hand, you can see it all right in front of you. Three gentle terraces, each about a foot high, create the backyard’s topography. On the highest, at the back of the property, the intertwining branches of a fig tree and an old purple-leafed plum create a tunnel over a winding walkway of patio brick.

The terrace below has the largest of the outdoor living spaces. It’s a patio made up of concrete squares, shaded on one side by the fig and plum tree, and at one end by golden hops that reach for the top of a simple arbor. A close relative of the hop that brewers use, it dies back seasonally to allow winter sun on the patio. It climbs eagerly in summer to provide breezy shade.

The third terrace slopes slightly towards the kitchen. Clouds of catmint, with their radiant deep blue blossoms, draw hundreds of bumblebees. Here and there huge artichokes ripen. Sandra and David don’t harvest the globes but let them open to a light blue, a different shade from the mint but just as brilliant and attractive to birds and butterflies.

Winding through the terraces is a pathway made of large chunks of broken concrete. Sandra stored the chunks for six years before cutting them into curves with a concrete saw and placing them in easy winding patterns to connect the garden’s many nooks and crannies.

Sandra’s a pushover for anything that comes up in the yard and looks decent. Once the lawn was gone, California poppies showed up uninvited. They found a home. So did Russell’s lupine, foxglove, fennel and cow parsnip.

“I didn’t plant any of these things, but here they are,” she says, delighted at what the birds and the Seattle breeze have brought her. “I suppose some of them are weeds, since I didn’t plant them. But don’t they look wonderful?”



A golden hop vine climbs eagerly onto the arbor in summer, offering breezy shade. It dies back in winter, allowing the sun to warm the garden patio.



BUILDING HABITAT Layer by Layer, Step by Step

The building that houses the Seattle Audubon Society is one of those chunky Roman brick buildings dating from the 1950s, when someone came through Seattle who really knew how to sell Roman brick. There are thousands like it throughout the city, made of the same narrow, beige brick that was so popular for a few years after the war.

When Seattle Audubon recycled this house to make an office in 1995, a landscape committee decided to “hide” the outside with native plants. The same plan would also give those inside some relief from the visual and aural effects of a noisy street.

The result is a lot more than camouflage. It’s a fine little demonstration garden where you can learn a lot about using native plants, and what landscape architect Keith Geller calls the “hop, skip and jump” design for attracting birds.

“They need food, shelter and water, but they also need a layered landscape from big trees all the way down to ground cover,” says Keith, who headed the volunteer team creating the Seattle Audubon garden. Different birds favor different heights of trees and shrubs, he points out. Some seldom venture lower than the branches of tall trees, others feed on the ground. Still other species move from top to bottom, perching, watching, hopping down to scratch for food in the lowest level.

This layered effect, created to benefit the birds, also happens to present a pleasing and effective screen between street and office.

Keith doesn’t hide his satisfaction at the way the garden has thrived.

“When you look at the building from afar, you see not the building itself but the habitat,” he points out. “And from inside, you really get the feeling of being *inside* the habitat.”

There was lawn here when they started, but not anymore. It was the first thing to go. Keith’s team grubbed it out by hand, piled the sod into gentle, curving mounds, and covered it with soil and wood chips, before they planted anything.

They left in place the top layer of the habitat (composed of a half-dozen large Douglas firs) which preexisted Seattle Audubon by many years. For the next layer down they chose vine maple and serviceberry, both native to the Seattle areas. They added seedlings of Pacific Coast dogwood, a native whose huge white bracts light up the middle canopy in woods all over the green side

of the Pacific Northwest.

All three—vine maple, serviceberry, and dogwood—provide food as well as shelter for the birds. So do the seed heads of the rhododendrons. These had grown from foundation plantings into wall-huggers as high as the roof; they now add to the screening effect mentioned above.

Naturally, the bottom layer of the Seattle Audubon garden is by far the most diverse. At least two dozen species of plants, most of them natives and all of them offering food or shelter for birds, thrive in the partial shade provided by the upper layers. Lower-layer evergreens include blue huckleberry, Oregon grape, and salal. These form a deep thicket along the street and will grow taller and more dense over the years. Between that screen and the building are deciduous shrubs including red-flowering currant, red huckleberry, and mock orange. A final sub-layer includes low-growing herbaceous plants like vancouveria, trillium, sword fern, deer fern, and vanilla leaf. (See page 40 for a complete list of plants in the Seattle Audubon garden.)

On the building's sunny side, next to the parking lot, Seattle Audubon inherited non-native foundation plantings Geller calls "the 1940s" – mostly juniper and tree heathers. His volunteers tore out the junipers. They left the heathers because they are "nice looking."



False lily-of-the-valley grows in a shady corner of the Audubon garden.

The designers consciously built the garden around native plants, but it isn't a strict regime.

"Yeah, it's a native garden," says Keith, "but a large English laurel tree remains. We decided to keep the main part of the garden truly native and consign foreign plants mostly to the parking lot area and the side street."

It's a given that no pesticides will ever taint Seattle Audubon's garden. As more and more native plant gardeners are discovering, the chemicals with which we poisoned our gardens for so many years are useless when we transform the lawn into a garden full of thoughtfully chosen, well-placed native plants.



A young section of Seattle Audubon's garden promises bird habitat and a useful screen against a busy and noisy street.



GOING NATIVE WITH A PLANT SOCIETY



Pacific rhododendron, the state flower of Washington, is an evergreen shrub with pale purple blooms.

It's the fun and companionship, Catherine Hovanic says, that has made the Washington Native Plant Society (WNPS) thrive. Assemble people who delight in getting to know native plants in the wild, and they will form strong friendships around the effort to protect and expand native plant habitat.

WNPS has more than 1800 members with chapters throughout the state. They learn about and propagate northwest native plants, enjoy field trips, get involved in restoration projects, and advocate for native plant habitat protection.

Native plant landscaping has soared in Washington, says Catherine, WNPS's Administrator. One consequence: attendance at the organization's annual native plant sale has tripled in recent years. To help satisfy the surge in popularity, members propagate natives from seeds and cuttings in hundreds of backyard beds throughout the Puget Sound Region. Members promise *not* to collect plants in the wild, but do—after thorough training—help salvage natives from development sites about to be bulldozed.

Catherine Hovanic makes some strong arguments for getting rid of your lawn in favor of native shrubs and ground covers. Natives, after the first year, can do without the fertilizer and pesticides that you would be pouring on a grass lawn (and that find their way into your local salmon stream), not to mention the high-priced drinking water that grass lawns thirst for.

Native plants are especially popular among those trying to establish or improve wildlife habitat. "Our native wildlife co-evolved with our native plants," Hovanic points out, "and natives are the best habitat you can provide for the species you want to keep here. Exotics may work well for bird habitat or as a source of food in certain locations, but at the same time they may be crowding out native species that would work better."

In other words, just because birds are feeding on English ivy or Himalayan blackberry doesn't mean that's what they prefer. These invaders crowd out native plants and with them any number of beneficial insects or other organisms that are beneficial to birds.

The plant society advocated successfully for the official listing of English ivy as a noxious weed, and helped organize the "ivy out" campaign in Seattle. Volunteers are currently working the hard way to remove English ivy from local parks and greenspaces—by yanking it out.

Asked to define her organization, Catherine says, "We're the voice of Washington native plants, trying to protect the incredible plant diversity we have here. We'll keep on doing that, and enjoying native plants with others sharing the same interest."

JAMES JACKSON: "This Garden is Me."

There's no lawn, but there's a riot of color in front of James and Octavia Jackson's house. It's the only house in the neighborhood with no grass, and Octavia says people are forever calling to her from the street to say how nice it looks.

While she keeps an exacting eye on the flowerbeds in front, 82-year-old James supplies the vegetables grown from containers on a concrete patio in the back. Dark purple eggplants hang in extravagant bunches next to big, scarlet bell peppers. They aren't supposed to grow in Seattle, but here they are, thriving without pesticides in the orange sunlight of a Puget Sound autumn.

There are six-foot-tall tree collards along the patio fence. James and Octavia Jackson eat collard greens all year, along with their squash, cucumbers, tomatoes, cabbage, broccoli, garlic—all from pots on the small concrete patio.

Here in mid-September, he's setting out new starts of cabbage and broccoli, not in a greenhouse but here in the open, in the backyard. He expects to eat them in late December.

James is in frequent demand as a lecturer on container gardening. He proudly displays his credentials as a King County Master Gardener Emeritus, a title he earned after a long career in the military and another as a construction supervisor for the City of Seattle.

He exhorts in brief homilies as he works. "Soil does not wear out but you have to help it." He refreshes the soil in a container with small handfuls of compost and a smidgeon of fertilizer. "You can use it over and over. We wear out, but the soil does not."

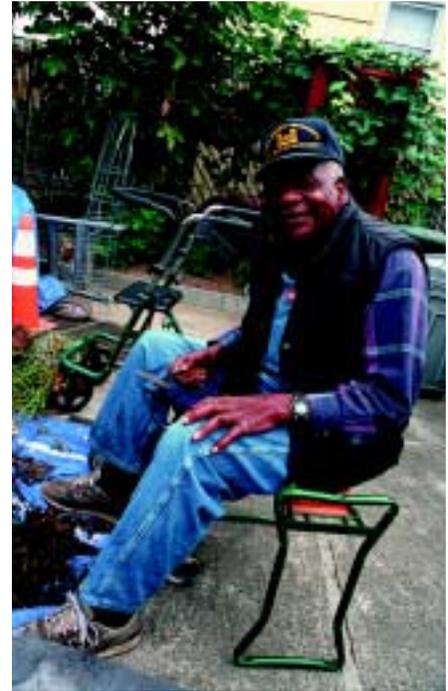
"You have to fit the plant to the pot." He eyeballs a cabbage plant and chooses a squat, broadly rounded clay pot. "Place it just so the edges of the cabbage head will meet the edges of the pot. That way it won't fall over and break off before you're ready to eat it."



He uses only one tool: a well-worn triangular bricklayer's trowel that's as high tech as he needs to go. "It does everything I want it to," he explains. "It's just right for digging, for scraping, for moving soil from one place to another."

Getting around the garden with the aid of a walker, wielding his trowel from a portable garden seat, he maintains a personality as sunny as his patio.

"This garden is me," he chuckles. "This is what I am. I'm not here forever, but I'm not gonna be laid up in any bed. When I go, I'm gonna go from right here, in the garden. Yessir."



DON NORMAN: Sharing the Bounty

Birds love fruit, but there don't seem to be a lot of fruit growers who love birds. Don Norman is an interesting exception. He does everything he can to *attract* birds to the same land where he grows abundant apples, pears, cherries, kiwi, grapes and raspberries. Somehow, for Don, it works.



Other than the occasional flock of starlings, the birds don't take enough of his fruit crop to worry about. And whatever they take, there's plenty left.

"This is half an acre; even on a quarter-acre you could produce far more fruit than you'd ever want to eat. I compost ten or 20 big buckets of fruit every year because I can't give it away before it rots."

He offers some ideas for lessening the competition that can turn a fruit grower into a bird chaser.

"Part of it's providing alternative food for the birds, and timing it so that it works with your orchard," Don says. "If there's Indian plum or service berry or mulberry coming ripe at the same time as my fruit, then I won't get much predation off the fruit trees."

A professional environmental toxicologist, Don doesn't merely admire birds as they pass through; he bands them and studies their migration habits. He meticulously records sightings, bandings and recaptures, and analyzes the data to discern seasonal patterns for both resident and migratory birds. More than 70 species have stopped in his sanctuary since he began keeping records in 1980.

A burgeoning frame of fruit trees, wax myrtle, serviceberry and nut trees provide fine mid-level structure for the constant bird visitors and nesters at Don's half-acre place in Richmond Beach, a few miles north of Seattle. Now he's working to make the lower-level bird habitats more welcoming. He's planting snowberry, red-flowering currant, and small Oregon grape, directly under and adjacent to his fruit trees.

At the same time, he's mixing these native plants with his summer vegetable garden. "I'm growing zucchini squash, snowberry and red-flowering currant together. Or you could put potatoes in the row with natives, and have a great place for the birds to scratch around in."

Don buys native shrubs from a Bellingham nursery at a bulk rate. A hundred snowberries for \$30; 50 red-twig dogwood for a dollar each. He's

interested in setting up a native-plant buyers' club so that gardeners converting from lawn to backyard wildlife habitat could save still more money by ordering more plants at a time.

This orchardist/ornithologist offers some tips for a flourishing native plant landscape:

- ◆ **Grow the bare root plants in pots for the first year** in a central, shady spot where it's easy to water. "That way you don't have to dig 100 holes the first day. You've got a full season to decide where you want 'em and get the holes ready."
- ◆ **Use big pots**, ten inches or more across. Those in the smaller pots get rootbound in the first year.
- ◆ **Buy small plants.** They'll grow faster and put down better roots than the bigger ones.

Don's twenty-plus years converting from lawn to orchard to lush wildlife habitat have whetted his appetite to learn more. For example, he'd like to know about successional tree and bush plantings to provide more bird food throughout the seasons.

"How do we know what to plant so that there's food as the birds move through? Here's a cascara; it provides a lot of fruit for birds. And it comes later than Indian plum. Where does serviceberry fit in there? How about tall Oregon grape? This stuff is important to know, but I've never seen a real good paper on the best succession for the bird life in a region like ours. Someone needs to do that."

He's justifiably proud of the ripening pears and sparkling red apples that hang in extravagant bunches in September. But after all these years of



Don mixes native plants with his summer vegetable garden—here, squash and snowberry.

getting to know the birds up close, fruit production is clearly secondary. If harvesting fruit conflicts with encouraging birds, the birds will win, every time. It's not even close.



Money-saver, too: *What's the difference in cost between maintaining a lawn and maintaining the same area as wildlife habitat? Don Norman thinks the comparison would be pretty amazing.*

"By the time you put in the lawn, put in the irrigation system, and add the money you spend on water and fertilizer, you have spent thousands of dollars. Then you spend hundreds more to have a gardener come and take care of it, or that much worth of your own labor to care for it."

"Compare that to others who put in a wildlife habitat area instead of lawn, establish it and let it grow—and just enjoy it."

"I bet the difference would be huge."

BRADNER PARK: Hoops, Cukes and Stir-Fry



The Bradner Park neighborhood's view of things has certainly made life complicated.

Its view of things is stunning. You can sit on the high stone steps at the southeast corner of Bradner Park and watch what's happening in downtown Seattle, on the gentian waters of Elliott Bay and in the green and snow white grandeur of the Olympic Mountains beyond. A view to be coveted. That was the problem.

Not that long ago, when the site was mostly asphalt, the Seattle Parks Department owned it, but the city administration wanted to sell it to a developer, who wanted to build houses here to capture that coveted view.

"We said 'Whoa! Wait a minute. You mean we're going to sell a park to a developer?'"

That's Joyce Moty, co-chair of a neighborhood group called Friends of Bradner Park. "We organized a successful 'Save Our Parks' initiative, so if the City's going to sell park land they've got to replace it with the same kind of property in the same part of town."

Joyce can tell you about Bradner Park's history, its ethnic and cultural diversity, and just about everything else concerning this remarkable piece of

urban agriculture and community.

P-Patches—plots where individuals and families grow flowers and vegetables—have been a great grassroots success in Seattle for a couple of generations. But the City battled with the local residents over one of the factors that has made this one succeed—the basketball court. Officials granted that basketball courts are good for neighborhoods, but asked why on earth anyone would want one next to a garden. Balls bouncing into the gardens? Kids tromping the squash and tomatoes?

The neighborhood committee members insisted. The basketball court stayed.

"We're talking subtle education here," Joyce says. "P-Patchers come to garden and the kids come along to shoot hoops. This sort of intros kids to plants. If they see where food comes from, at least they'll know it grows out of the ground. Maybe some day they'll get interested in gardening instead of being totally sports-oriented."

A grant allowed the Bradner coalition to put in a fence high enough to block basketballs. Local sculptors, both amateur and professional, have woven

into it some amazing designs made of pitchforks, garden tools and parts of old farm machinery.

Mixing cukes, hoops and art typifies the Bradner Park story. Not much more than an acre, the park combines vegetable and flower patches, demonstration gardens, art, architectural invention, creative landscaping, and a leftover strip of lawn (neither watered nor fertilized) where little kids romp and couples come to get married.

At the entrances to the park hang artistic symbols of salmon contributed by local artist Buster Simpson. They symbolize the health of the poison-free garden. As Moty puts it, "What we put on our gardens goes into the water environment. If we apply pesticides up here, the fish will be taking them up. It's all connected."

The subject of pesticides rarely arises. In Seattle P-Patches, pesticide-free gardening is a given.

Bradner Park's 61 P-Patches (each one ten feet by 20 feet) rent for \$39 a year. They feature raised beds filled with deep, black loam. Most are planted so intensively you have to be nimble to make your way through the beans and broccoli.

Soil-building happens all over the park, especially at two composting centers where gardeners chop the stems, leaves and other detritus of gardening, and turn them into soil using the "hot compost" system of half-green half-dry plant material, stored in a series of bins and turned once a week.

A mysterious layer of deep black mulch covers the ground in several of the plots. It's rotting milfoil, a pesky aquatic weed that plagues local boaters. The City harvests it to keep the lakes navigable and the Parks



Joyce Moty and her determined neighbors passed a citizens initiative to stop the proposed sale of Bradner Park.

Department delivers it to the P-Patches. This near-perfect mulch holds moisture in the soil, deflects the heat of the sun and delivers abundant nitrogen. And plants grow, and grow, and grow....

Benches carved from logs include salmon designs to symbolize the interconnectedness of the gardens and the Sound.



There's a lot more than plants growing here. The community-building among the neighbors is a gratifying story in itself.

Mien families from Laos have been using the P-Patches from the beginning. "We've learned so much from them," Joyce says of the Mien. "There has been a constant exchange of plants, seeds and ideas across language barriers and cultural differences."

"When they started coming here, I noticed that the women did all the gardening while the men sat in the cars and chatted," Moty recalls. "Now some of the Laotian men have become the lead gardeners in the park."

One of the most popular of the many Friends of Bradner Park workshops is a Southeast Asian cooking demonstration, led by Kouï Seng Sachaou, one of the Mien P-Patch gardeners. Neighbors chip in a few dollars to the P-Patch fund in return for learning the secrets of savory stir-fries.

At a small, open-sided pavilion, neighbors celebrate New Year's Eve, throw a whopping Fourth of July potluck, and participate in the September "Week of Giving" harvest celebration. That's when Seattle gardeners bring surplus produce—from home gardens as well as the P-Patches—to be distributed to needy families through Seattle's food banks.

Architecture students have left their own imprint on Bradner Park. University of Washington students built the pavilion, with its unique laminated beam in the shape of a leaf. They designed and built a wooden footbridge arching across the stony streambed that bisects the park. They created three portals, each with an individual design tied to the theme of gardening with nature. Again—symbols of connection and openness.

The great wonder of Bradner Park is that it happened at all. Determined neighbors and visionary City employees transcended disagreements and city hall politics. They transformed a vacant lot to a place of great beauty, function, and diversity in less than five years. After a rocky start, the City came to be a steady supporter. But mostly it's been the work of neighborhood volunteers.

Blocks of Tenino sandstone mark the softly curving outlines of the garden's center pathway. Citizens have inscribed names and garden homilies, in return for contributions to the P-Patch fund. One of the inscriptions speaks for many of the diverse community using this thriving neighborhood park: "To garden is to love."



Each September, P-Patch gardeners bring surplus produce to Bradner Park for distribution to needy families and food banks.



WOODLAND PARK ZOO: Do Do That Zoo-doo....

Step into a little corner of Seattle where Monarchs and Queens and Viceroy and Admirals will look you over, their curiosity punctuated by dark Commas and bright red Question Marks.

A thousand butterflies of more than 30 species flutter over your head, land on your arm and keep you spellbound in Woodland Park Zoo's "Butterflies and Blooms" exhibit.

They feed from brilliant nectar sources. Butterfly bush, heliotrope, yarrow and scores of other bright blooms flourish here. Not surprisingly, so does powdery mildew, that ugly fungus that disfigures leaves, flowers and fruit for every home gardener. It's a constant menace in the carefully enclosed, warm and humid environment.

Chemical fungicide? You've got to be kidding.

"We couldn't possibly," says horticulturist Barbara LeBrun, who oversees the exhibit. "Butterflies are supersensitive. It would destroy them."

Barbara and her gardening associates head off plant diseases with compost tea, once a week, twenty-four gallons at a time. She soaks the plants—especially scabiosa, cosmos, verbena, all quite susceptible to powdery mildew—and drenches the soil. Sprayed on plants, the elixir of compost, aerated water and nutrients works magically against diseases like black spot, apple scab, tomato blight, and many more.

While powdery mildew is the main target here in butterfly land, experience has convinced LeBrun that compost tea is good for whatever ails a plant, even insect damage.

"The plants are just so much greener and more vigorous with the tea. You can ward off a lot of problems just by having a healthy plant."



Horticulturist Barbara LeBrun heads off powdery mildew in Woodland Park Zoo's Butterfly Dome. Barbara uses a backpack applicator to soak plants with compost tea.

The butterfly exhibit is one small piece of the Woodland Park Zoo's 90-acre domain, containing the most diverse plant mixture you could dream up, populated by an equally great mix of exotic animals, birds and insects. Nine thousand people check it out on a busy day. It has to look good. A lot of the wild animals (and some of the people) rub up against the plants. The landscape *has* to be poison-free.

That's E.J. Hook's challenge. He's the Landscape Supervisor. Follow him around for an hour, hear his enthusiasm for natural plant care, and you wonder why you might ever have considered using pesticides.

E.J. not only wants you to understand his craft, he insists on it. Bits of plant care philosophy fly off like ladybugs on the wing:

Plant disease?

"Compost tea to the rescue!"

Your favorite greenhouse plant overrun by insects?

"Dunk it in water, wait for the bugs to come up for air, then squish 'em!"

Holes in the leaves of cabbage and broccoli plants?

"Tolerate, tolerate, tolerate!"

Tolerance is essential here. "Count on some plant damage," E.J. says. "Some weeds, some aphids. That's all part of nature. We're not after exclusion, we're after control and management."

Total pest eradication wouldn't lead to a healthy garden, even if it were possible. The Zoo's landscape staff instead pursues balance. Balance between human desires and natural functions, and between different kinds of natural functions. You can't get such balance with pesticides.

Natural controls apply here, with two exceptions. First, the Zoo quarantines and "disinfects" newly-arrived exotic plants to eliminate any hitch-hiking insects that might get loose. Also, the Woodland Park Rose Garden gets a periodic dose of sparingly applied chemical fungicides. "This is one of only two dozen All-America test gardens for roses," E.J. explains. "People expect it to look *exceptional*."

It does look great, but E.J. wishes it could all be done with natural controls. "We'd love to use

compost tea here in the rose garden but we haven't figured out how to make our labor resources match up with what we want the roses to be. We just don't have the manpower to keep mixing and spraying it on five thousand roses."

E.J. and his crew do use compost tea wherever they can. The Zoo has an unending supply of raw material, from elephants, zebras, and giraffes. Tons of their byproducts are stacked in a dozen huge mounds in the zoo-doo yard. From the freshest to the ripest, the manure is systematically turned, stirred and re-stacked every two weeks. That process creates a huge pile of deep brown, crumbly compost that looks good enough to eat (well, almost).

From one of the middle mounds, part way through the natural digestion process, E.J. shows us how to find the best material for compost tea. "You look for the white fungus clinging to the plant material," he explains as he digs into the pile. "It means the beneficial organisms are at work, creating compost. You get 'em while they're at their most active, and that's the basis of your compost tea."

Unlike E.J. Hook, you can choose whether or not to use chemicals on your home garden. But he says it's a choice you should never have to make. He suggests that you think instead about ways to change your garden.

"Don't start by asking 'What's the least toxic approach,' but by asking what the real problem is. If you have areas of your garden where you regularly have to go in and add water or pesticides, or weed-weed-weed, maybe you need to change that area of your garden. Could be the wrong plants are growing there."

"Look at the location, variety, and so forth," he suggests. "And make all the other decisions based on that. Then you shouldn't even have to consider using pesticides."

Thousands of delicate butterflies show that E.J.'s approach has a lot going for it.



These warm, humid conditions are conducive to dozing butterflies (as well as powdery mildew).



Let's Have Tea and Compost

You can buy a complete outfit for brewing compost tea like E.J. Hook's. But commercial setups are much bigger than backyard gardeners need. So why not rig your own "teapot" for much less?

Start with good garden compost, a five-gallon bucket of water, and a small mesh or burlap bag. Half a gallon of compost, held loosely in the cloth bag, is about right for a five-gallon batch of tea. Add an aerator (a large aquarium air pump—\$27 at Seattle pet stores—will work). This is important, because non-aerated compost tea becomes anaerobic, also known as a stinking mess, and can damage your plants. You'll then need to add a few ounces of nutrient to feed the billion tiny organisms you're about to produce. Plain, un-sulphured molasses will work, but the commercial, pre-mixed SoilSoup (\$25 a gallon at www.SoilSoup.com) seems to inspire more of the beneficial organisms to multiply like crazy, and that's what you're after. And a gallon goes a long way.

(A tip from E.J.: chlorine is almost always in tap water—get rid of it *before* you start mixing. Either bubble air into the water for an hour, or let the water sit in a bucket overnight before you begin brewing.)

Start the bubbler. Soak a half-gallon of compost in the bag in the five gallons of water. Add the nutrient. Stir it now and then. Bubble air into it for 36 hours, and bingo! it's ready. Spray it on your plants as soon as you can, because the wonder-working organisms begin to decline within a few hours.



E.J. Hook holds a handful of Woodland Park's famous Zoo-doo compost, his preferred ingredient for the Zoo's compost tea.



Roses Without Chemicals?

Compost tea is great for preventing black spot and mildew on roses, but they haven't found a way to use it at the huge Woodland Park Rose Garden—at 2.5 acres with 5,000 individual rose plants. Instead, they apply a baking soda compound and commercial fungicide.

"If we can ever figure a way to make it cost-effective we'll use it," Landscape Supervisor E.J. Hook explains. "As it is, with the mixing, brewing and spraying of huge batches, we wouldn't have time for all the other things we have to do."

"And this particular garden has to look super, all the time. It's an All-America test garden, one of only two dozen in the country. We have to keep it as near perfect as we can."

Here's where you have an advantage over the zoo's landscapers—even if you don't have an elephant. "At home, with a reasonable-sized rose garden, compost tea's the thing. Start putting it on early in the season and keep it up every two weeks," E.J. advises. "Mildew and black spot won't even be able to find a place to get started."

FAUNTLEROY CREEK: Save Fish, Help Birds



Judy Pickens, Phil Sweetland and the rejuvenated Fauntleroy Creek.

Last year Friends of Fauntleroy Creek published a list of 68 bird species that frequent the shady ravine and travel up and down the stream. And volunteer salmon watchers counted 167 coho in the quarter-mile spawning channel.

They were trying for salmon. The birds were a wonderful surprise.

Judy Pickens and her husband, Phil Sweetland, began a campaign in 1969 to restore Fauntleroy Creek, a neglected little stream in West Seattle that was once bank-to-bank trout and salmon.

The salmon quit coming upstream about 1910. By 1969, blackberry briars covered a sluggish creek disgraced with bottles, cans and other human debris. About all Fauntleroy Creek had going for it was a large number of fine old trees and a handful of families who cared about what became of it. Its rebirth has become a symbol of what can happen when organized citizens and government agencies manage to get on the same page.

Pickens, Sweetland and the Friends of Fauntleroy Creek enlisted Youth Conservation Corps members to help clean the trash from the stream, yank out briars and plant native shrubs. Children from nearby elementary schools planted coho salmon, starting in 1990. When two of the fish (the neighbors named them Terry and Louise) tried to come home in 1994 and couldn't make it through a failing, 83-year-old culvert, Seattle Public Utilities (overseer of the City's water and surface drainage services) installed a new culvert, then agreed to engineer and build a state-of-the-art fish ladder.

Two weeks after the fish ladder was opened, big salmon were thrashing their way through the weirs.

As though scoring a bonus for their hard work, Pickens and Sweetland found that the winding creek's restoration made their backyard a prime birding area. Birds now flock into the shady canyon to feed on the fruits and seeds of red osier dogwood, red-flowering currant, Oregon grape, and dozens of other natives now growing tall and thick along the stream.

"We chose native plants as best we could for renovating the creek," Judy Pickens recalls. "We were thinking about the insects, attracting insects to the water as fish food. It wasn't more than two years later that we began seeing birds we hadn't seen before, and lots more of what we had seen."

Children from Seattle schools come by the busload to watch the fish, count birds, measure waterborne insect life, and learn the mysterious ways the plants, insects, birds and fish interconnect.

Above the creek, on a public hiking bridge, Olympic Peninsula artist Tom Jay has created "echoes" of the creek in concrete, stone and bronze. Here, surrounded by birdsong and the music of a healthy stream, you can trace the recurring miracles of small salmon headed for the ocean, and of great salmon struggling eternally homeward to create new beginnings.



STEVE HALLSTROM: Who Needs Rain, Anyway?

When Steve Hallstrom goes to the field at daylight to harvest the rich produce of his 2.5-acre river bottom farm, he finds the soil moist and the plant leaves wet. It hasn't rained, but his crops look as though it has, late in a very dry summer in the Snoqualmie Valley. Indeed, even at 9:30 on a warm August morning, much of the ground remains very damp.

Steve can't waste water. His irrigation well yields about one and a half gallons per minute, not nearly enough for heavy watering. But he has nature working for him: The Tolt River delivers airborne moisture during the cool nights, and broad-leafed vegetables collect it like funnels. The loamy soil of his farm holds moisture at the root level where the plants can make best use of it. He never subjects the land to the drying effects of chemical fertilizers.

A steep, grassy hill with a crown of fir and cedar a few hundred feet west of the gardens casts an early shadow on the fields, to reduce the intense afternoon heat of late summer. Thick woods border two sides of his fields. They shade the fields in the morning and help hold the dew and fog that have already burned off in the sunnier parts of the garden.

The house, barn, hillside and bottom land are all of a scenic piece; Thoreau material, had Thoreau been at all interested in the bruising, hands-in-the-dirt toil that organic truck farming demands.

Steve makes use of the microclimate by matching crops to the best hours of sun and shade. Plants such as cabbage and broccoli, whose leaves trap the dew and funnel it into the center of the plant, grow on the shady sides of the field, and get very little irrigation. Corn, squash, and pole beans, heat lovers all, get the sunny sections and most of the carefully applied well water.



An essential principle at Steve Hallstrom's farm: Don't try to control nature. It isn't necessary and it probably won't work anyway.

They shade the fields in the morning and help hold the dew and fog which has already burned off the sunnier parts of the garden.

Interestingly, Steve doesn't go along with the trend toward drip irrigation and plastic mulching.

"I don't think much of those systems," he says. "Maybe you save some water, and that's environmentally sound. But the yards of petroleum-based vinyl tubing you buy, and the yards and yards of petroleum-based plastic sheeting? That all winds up in the landfill."

Ordinary oscillating sprinklers, perched on platforms just above the crops, work best for Hallstrom. "It's the closest thing to rain," he says. "When you're irrigating in hot weather you want large drops that fall quickly, with the least evaporation." Impact sprinklers break up the drops, and seem to him to deliver less water to the ground, where it's needed.

Water timers to control the sprinklers? "I'm the timer. I look at the plants and the soil and when it needs watering, I water."

Insect control? He dusts with diatomaceous earth and rotenone for flea beetle. Otherwise, nothing.

Fertilizer to feed those lush and juicy vegetables? "Chicken manure. That's it." How much? "I really don't know. I put it on with my manure spreader until it's an inch thick or more, and till it in." (Hallstrom is careful to keep the manure, like the rotenone, out of the water.) He uses moderate-to-heavy applications of ground limestone, but no additional phosphate or potash.



It works. The proof comes on the Wednesday evenings and Saturday mornings at the University and Columbia City farmers' markets in Seattle. Hallstrom rushes to serve the customers who queue up at his stand, and to replenish the wide range of produce. Pumpkins, pole beans and brilliant red lettuce all fly out of his boxes.

The payoff for the Hallstroms and for scores of other small Seattle-area organic farmers? Their customers' gratitude.

"Now and then someone will take the time to say how much they appreciate our being here, and how important it is to be able to buy good, healthy food. That makes it all worthwhile."



Steve Hallstrom thrives on his customers' enthusiasm for his tasty, healthy organic produce.

GIVING UP PESTICIDES

Not Just for the Birds... For the Kids.

If you're still looking for a reason not to use chemical pesticide on your lawn and garden, try this:

Ninety-nine percent of the four-year-olds in a recent study had at least one compound in their systems traceable to *organophosphorous* pesticides. That's the group that includes diazinon and chlorpyrifos, two of the most common household lawn and garden pesticides. Three quarters of the kids had two of the compounds in them.

University of Washington researchers tested the urine of 96 toddlers from two communities; one in a highly urban, low-to-middle income setting south of Seattle where apartment buildings are common, the other in a suburban area north of Seattle, with upper-middle income families living mostly in single-family detached homes. Of the 96 children, only one showed no measurable trace of the pesticide compounds (that was the tot whose parents reported using no pesticides at home and buying only organic produce.) The results were similar in the two communities. No matter where you live, the kids are exposed.

The same studies showed high levels of the highly toxic compounds known as *dialkylphosphates*, or DAP's, even where families had not applied pesticides for months. These pesticide residues can be tracked easily into the house, settle in the carpet and hang around for a long time.

The UW researchers are still studying the long-term health effects of exposing children to these chemicals.

It isn't just for the birds that organizations like Audubon discourage the use of pesticides in favor of benign methods of pest control.



Good news for people and birds: The EPA recently decided to phase out retail sales of both diazinon and chlorpyrifos (e.g. Dursban). Gardeners should immediately dispose of any leftover supplies and containers at a King County hazardous waste disposal facility.

See www.metrokc.gov/hazwaste for details.



JON ROWLEY: Linking Soil and Flavor

Jon Rowley pursues the link between great soil and exquisite flavor.

Rowley's a professional food-marketing consultant who has spent his working life searching for superbly flavored fruits and vegetables, the kind that come from superb gardening. His quest inspired an intense curiosity about the natural processes that produce the plant sugars that affect the flavors, and, logically enough, from there to an investigation of what makes truly great compost.

At 59, Jon has become the dean of dirt in Seattle. He lectures widely on his technique for hot composting and for a cooler but equally effective system he calls Interbay Mulch. He and other gardeners at the Interbay P-Patch are four years into a ten-year experiment, seeking to understand the role of organic matter in producing the most abundant and highest-quality vegetables.

They run the tests on eight plots with eight different soil treatments. One of the ten-by-ten plots receives only chemical fertilizer. It does poorly compared to the others, including one with leaf mold only, one with composted livestock manure, and a "sea bed" mixture of kelp, seaweed and crab shells.

Jon not only weighs the amount of vegetables produced. He also checks the "brix" reading—the level of dissolved plant solids in the juice as measured with a refractometer, a device commonly used in winemaking. High plant sugars mean a higher brix reading, and more distinctive flavors.

The experiment may help answer a question that he and many others have been asking for years: Why do many fruits and vegetables lack the flavor that they had in years gone by, and how can those flavors be restored? The answer seems to be in the soil, and Jon Rowley will dig happily until he comes up with it.



HOT TIMES IN THE COMPOST BIN

Here's the short version of Jon Rowley's secret recipe for quick, hot compost: half browns, half greens.

Browns include dried grass, dead leaves, wood shavings, even shredded paper. This stuff has a high ratio of carbon to nitrogen. **Greens** are garden leftovers, fresh grass clippings, barnyard manure, coffee grounds, or anything with a low carbon:nitrogen ratio.

Mix it all in the bin, protect it from the rain, leave some of the sides open for air. Turn it once a week to add oxygen. It gets so hot that you could probably bake a cake in there—but don't. The heat kills weed seeds and disease organisms, and turns the plant material into mealy soil in a few weeks.

For easier, cooler compost, take the same 50:50 mixture of greens and browns. Mix it directly on top of the garden bed. Add a wheelbarrow load of your own compost to inspire microorganisms. Cover with burlap. (Jon uses heavy coffee bags discarded by a Seattle coffee-roasting company.)

Check it now and then to be sure it's moist. Otherwise, ignore it 'til spring, when you'll find 2-3 inches of soil for every foot of material you started with.

Hot compost or cool, flowers and vegetables just about leap out of the beds. Best of all—they do it without a pinch of chemical fertilizer or pesticide.

Creating Your Own Healthy Habitat

The traditionally landscaped yard, complete with a well-kept lawn, manicured flower beds, and sheared shrubs, hinders nature and wild creatures. But “landscaping” these days is redefining itself as more people garden with the goal of *inviting* wildlife into their yards.

The next few pages will help you start your own healthy habitat - a healthy, beautiful garden for your family, and valuable habitat for songbirds, butterflies, and dragonflies.

Gardening for wildlife can be as easy or ambitious as you want. Without planting even one plant, you can make a livelier, healthier, and more enjoyable garden by changing or stopping some common gardening practices. Adopting new methods can benefit endangered salmon and improve the water quality in your community. More ambitious gardeners will find abundant possibilities to provide shelter, space, food, and water for birds and other wildlife.

This chapter offers explanations for new approaches to gardening as well as practical tips about how to garden for wildlife. We hope that you will find it useful whether you are a low-exertion gardener or one with boundless energy.

We tried to keep this chapter brief. Chapter 4, Resources, contains more details on creating healthy habitat. It also includes references for information on building soil, preparing a site, buying native plants, getting bare-root and potted plants into the ground, sowing seed, removing weeds, building a pond, watering and much more.

“When we lose the common wildlife in our immediate surroundings, we run the risk of becoming inured to delight, and eventually, alienated from the land.”

Robert Michael Pyle.



Sketch by Carleen Zimmerman

Simple Steps for the Lively Garden

1. Stop killing things.

Practice peace in the garden.

Gardeners disrupt connections in the web of life in many ways. Most commonly they get rid of unwanted actors in the garden through a variety of pest-control methods. And all too often, they let an introduced predator – the domestic housecat – run freely.



In the natural world of the garden: *insects eat plants*. It is a fact. Some view this as ugly and unhealthy. Insects that eat plants are often called “pests.” And yet *98 percent of all insects are actually beneficial*. Your gardening will change when you accept the fact that it is perfectly natural for insects to eat plants.

Chemical pesticides can harm or kill wildlife directly if exposure occurs during or soon after the application. They can kill indirectly, too, if wildlife eat tainted food or drink tainted water. For example, as pesticide runoff enters our urban streams, fish and riparian wildlife are exposed to the chemicals and may be harmed. In addition, bats and birds that depend on a healthy population of flying insects will suffer as pesticides kill off many or all of this local food supply.

What you can do:

- ❖ **Start with prevention** to lower your chances of even developing a pest problem. Maintain healthy plants and soil to resist pest and disease problems, and encourage beneficial insects.
- ❖ **Dispose of the most harmful pesticides immediately.** These include diazinon, chlorpyrifos (Dursban), malathion, and carbaryl. See www.metrokc.gov/hazwaste for details. Avoid products with label messages like “highly toxic” or “may be fatal if swallowed.”
- ❖ **Try non-toxic alternatives** to address pest problems. Hand removal can be effective for large pests like tomato hornworms and snails. Tent caterpillar infestations, caught early, can be pruned out. Repeated washings of aphids off plants from the strong spray of a hose can reduce

damage. Drown slugs in beer or in a mixture of yeast and water. Use baking soda mix or compost tea for mildew and scab.

- ❖ **Try preventing weeds by smothering them.** Weeds thrive in bare soil and neglected areas. Try preventing them by smothering them with weed barriers and lots of mulch, or by planting a native groundcover that will outcompete them. Pull out weeds before they go to seed, and be persistent in pulling problem weeds. Finally, remember that a “weed” is just a plant in the wrong place, and accept a few weeds in the garden. Target the problem weeds, and forget the others.
- ❖ **Keep your cat indoors,** especially during the dawn and dusk hours and during the bird breeding season. Cats kill millions of birds each year.

Facts about insects and pesticides

- ❖ 98 percent of insects are beneficial, yet few pest control strategies discriminate between “pest” and “beneficial” insects.
- ❖ Pesticides kill an estimated tens of millions of birds every year in the US.
- ❖ A healthy population of beneficial insects keeps populations of insect pests in balance.
- ❖ Spiders, salamanders, frogs, toads, snakes, lizards, voles, shrews, and birds are primarily insect-eaters.
- ❖ Even seed- and nectar-eating birds, such as hummingbirds, rely on a diet of invertebrates when raising their young.
- ❖ Pesticides often kill far beyond their target. Many kill soil organisms that are essential to healthy soil and healthy plants. The traditionally landscaped yard, complete with a well-kept lawn, manicured flower beds, and sheared shrubs, hinders nature and wild creatures. Now, “landscaping” takes on a different definition as more and more people garden with the intent of inviting wildlife into their yards.



2. Stop cleaning up.

In the garden, death is the raw material of life.

A clean and tidy garden is probably a garden without much life. Leaving plant debris as organic mulch benefits plants and wildlife. Seedpods left in place attract seed-eating birds like sparrows and finches. Loosely-stacked brush piles built from pruned or fallen branches offer cover and increased foraging possibilities for wildlife. Dead and snag trees provide food and essential shelter for a multitude of wildlife.

Your garden may contain some waste material that should be removed. Any non-native noxious or invasive plant material that will re-seed or continue to grow should be removed from the garden.

Organic matter improves the health of your soil and your plants in many ways. Using organic matter as mulch conserves moisture, helps prevent weeds, and provides foraging habitat for beneficial wildlife. The abundant

What you can do:

- ❖ ***Avoid chemical fertilizers.*** Using compost will build larger populations of the soil organisms necessary for healthy soil.
- ❖ ***Let organic matter (leaves, needles, cones) decompose*** as a natural mulch on the surface of garden beds. Leave last season’s seed stalks and plant growth in place.
- ❖ ***Resist the urge to cultivate.*** Cultivation disturbs the recycling system set up by soil-processing organisms.
- ❖ ***“Grasscycle” (mulch mow) your lawn*** – leave chopped up grass clippings on the lawn as fertilizer.
- ❖ ***Convert dead or dangerous trees to snags*** so they may provide a home to cavity-nesting birds.
- ❖ ***Use fallen and pruned tree branches to construct a brush pile*** for wildlife, or chip these branches for soil mulch.

microorganisms in organic soil help plants produce complex starches and proteins. (In contrast, soil not enriched by compost contains fewer microorganisms, so plants produce more simple sugars that are tasty to insects.) Organic soil protects plants against disease. Fruits and vegetables growing in organic soil suffer 60–80% less disease.

The secret to healthy soil? Soil organisms. You will need a healthy population of soil-processing organisms, like earthworms, to work the soil and break down the organic matter. This will improve soil drainage and allow the broken down organic matter to be taken up again by the plants as recycled nutrients. Chemical fertilizers and pesticides are frequently toxic to soil organisms, so if you are using these, your soil won't be very fertile. Check with one of the resource organizations listed on page 44 to find out how to assess and improve the health of your soil.

3. Plant more plants

The best way to attract birds to your yard is to have species that grow in their natural habitat. Plants are the foundation of life in the garden. While you can keep the non-invasive ornamental species that you love or that contribute to the liveliness of the garden, be sure to include many native plants that provide food and cover for wildlife. After all, the native plants are the ones our native birds have evolved with, and native plants grow easily in our climate and soil conditions, so they require less maintenance.

Garden Wildlife Features

By following the three steps for a lively garden, you have created a healthy, hospitable habitat for native wildlife. Adding some of these wildlife attractions to your garden will make it even more welcoming to critters.

What you can do:

❖ **Incorporate natives into your garden** as much as possible, and try to select natives from your specific part of the region. Get ideas for natives from a neighborhood park or greenbelt.

❖ **Let plants grow.** Like people, plants are happiest when they are allowed to reach their full potential. Move plants that are too large for their planting area. Prune to look through (rather than over) tall plants.

❖ **Remove your lawn.** To do this, smother it with several thicknesses of newspaper topped with five inches of compost and soil. With the

help of earthworms, this will decompose enough for deep-rooted plants to penetrate through or take root below. A quicker (but more expensive) alternative is to rent a lawn-cutting machine.

❖ **Watch out for invasive and noxious plants.** Invasive plants in the Puget Sound region include Scots broom, English ivy, Himalayan blackberry, English laurel, English holly, Japanese knotweed, evergreen blackberry, herb robert, and morning glory. If not controlled, these plants can create a wildlife-unfriendly monoculture.

Just Add Water

You need a reliable source of clean water for bathing and drinking to attract and keep birds in your yard, and to entice them to nest. Anything from a simple birdbath to a constructed pond will suffice.

Certain features will make your birdbath more popular. Birds prefer shallow baths with gently sloping sides, although if you already have a deep bath you can make it shallow by adding a layer or two of rocks in the bottom. A rough-textured bowl is better for bathing than a slippery surface, and birds love running water—installing a dripper or mister will bring even more birds to your bath.

Change the water every few days, and clean it periodically with a plastic brush. Keep the water thawed as well, as birds need to drink water even on the coldest days. A wooden stick left in the water can help you easily pop out the frozen ice and replace it with fresh water.

Consider water features beyond the traditional birdbath. For example, a well-planned pond can help transform your yard into a magnet for wildlife, including fish, birds, butterflies, dragonflies, and damselflies. There are many factors to consider when planning your pond – permit requirements, safety, location, size, shape, depth, how to line your pond and filter the water, whether to add a cascading waterfall, what vegetation to plant in and around the pond, etc. Many wonderful resources can help you plan your pond, or you may wish to consult a professional.

Dead Trees and Down Wood

Snags and down wood occur naturally in the forest. But in our urban landscapes, we often think of old, dying, fallen, or standing dead trees as unsightly, and remove them. Many native songbirds are cavity-nesters, meaning they excavate their own nest holes in dead or dying trees or use abandoned cavities. Good cavity nesting sites for birds are no longer abundant. Birds and mammals that seek cover and forage for food in dead wood are also suffering.

By leaving snags in place, you create more opportunities for cavity-nesting birds to create a home, and for insect-eating birds to forage for food. These include nuthatches, woodpeckers, and wrens. Safely create and preserve snags from dead, dying, or hazard trees, or add them to your landscape.

By leaving in place some down wood, you enhance your natural landscape and provide small animals with food and shelter. Over time, down wood decomposes and enriches your soil with nutrients. If your yard does not contain down wood, you may add it to your landscape by salvaging dead wood from a construction or logging site.



Bird Feeders

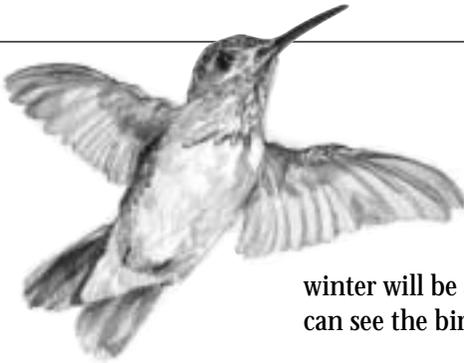
Bird feeders can be a fine supplement to a lively garden. It may surprise you to learn how many bird species visit your yard if you offer a variety of food. Think about the types of food to offer, where to place your feeders, and how to prevent the spread of disease.

Feeder possibilities vary widely. So do the types of bird foods that go with them. Keep in mind the types of birds you wish to attract. Larger birds, like jays, need a wider perching area, whereas smaller birds like chickadees will gladly cling to a tiny perch, even upside-down, to nab a sunflower seed. Insectivorous birds, like all of our woodpeckers, will happily feast on suet (which include animal fat), hummingbirds dine on sugar water, and goldfinches are partial to thistle seed. A platform feeder with cracked corn may bring you Band-tailed Pigeons and California Quail if you live near their habitat. Black oil sunflower seed is perhaps the most popular seed with birds, and inexpensive mixed seed is the least popular – in fact, much of it is undesirable and wasted.

Hummingbird Nectar Recipe

Combine one part sugar and four parts water in saucepan and bring to a boil.

Remove from heat and let cool before filling the feeder. Do not add red food coloring – this can harm the birds. Store excess in refrigerator. Change the nectar frequently to discourage the growth of bacteria, especially in warmer months.



Feeder placement, too, influences what will come to your yard. Make bird safety and comfort a top priority. Place feeders away from pets, traffic, and strong winds. Nearby trees and shrubbery allow birds to seek cover quickly if a predator appears; however, shrubbery too close to the feeder may enable outside housecats to stalk and kill birds that gather on the ground below the feeder. A dry spot will keep your seed from getting wet, and a sunny spot in winter will be appreciated. For your own benefit, choose locations where you can see the birds easily. Many birds will come right up to a window feeder to

Follow these simple rules when buying, building, or maintaining a nest box:

- ❖ **Know which species you are trying to attract.** This will determine the box's style and size, the diameter of the entry hole, and the best location and height for the box.
- ❖ **The box should be free of toxins and preservatives.** This means no paint inside or outside the box. Western red cedar is sturdy with good insulating properties, and contains natural preservatives to keep it from rotting.
- ❖ **Protect the nestlings in your box.** Make sure the box is large enough for the desired species so that the nestlings are not crammed against the entry hole, where they can be nabbed by a predator or fall out. Also, make sure the roof overhangs

the front by at least an inch to keep predators from stalking the entry hole; avoid boxes with entry perches for the same reason.

- ❖ **Keep your box healthy and clean.** A few quarter-inch holes near the top of the box improves ventilation so the nestlings do not suffocate; a few drainage holes in the bottom let out moisture. A slanted, overhanging roof keeps out the rain, as do watertight seams. A smooth entry hole keeps feathers from becoming tattered. With a hinged side or bottom, a box is more easily opened and cleaned of all old nesting material from the previous season.

get food.

Clean your feeders at least twice a year to prevent molds and bacteria from harming the birds. Discard old seed and clean the feeder with a very mild bleach solution. Soak the feeder for about one hour. Some feeders can go directly into the dishwasher. Keep the area around your feeders raked clean of discarded seed shells and excess food. This will help discourage unwanted mammals, such as rats.

Nest Boxes

You may wish to provide some well-designed and maintained nest boxes. Not all “birdhouses” are created equal; in fact, many birdhouses on the market are for decoration only.

See the green box on facing page for tips on selecting or building a good nest box.

Homemade Suet Cakes
<i>1 cup crunchy peanut butter</i>
<i>1 cup lard</i>
<i>2 cups quick cook oats</i>
<i>2 cups cornmeal</i>
<i>1 cup flour</i>
<i>1/3 cup sugar</i>
<i>Melt the peanut butter and lard, add remaining ingredients, and cool.</i>

Keeping a Garden Journal

Start a field journal to track the changes you see in your yard and enrich your connection to nature. Things you might observe or describe:

- ❖ What you see, hear, and smell
- ❖ What you don't see, hear, and smell, but might like to
- ❖ Changes in the garden related to:
 - ◆ changes in gardening practices (look at soil, plant life and wildlife.)
 - ◆ changes in the plant community
 - ◆ changes through the seasons
 - ◆ changes over time: births, growth, deaths, etc.
- ❖ Surprises: volunteer plants, new wildlife, etc.
- ❖ How you feel in the garden - take note of impulses, fears, joys, disappointments

Keeping Cats Indoors

Predation by cats is a leading threat to birds and wildlife in urban and suburban areas. By keeping your cats indoors, you help protect local wildlife, and you help your cat lead a longer, healthier life.

Cat Facts:

- ❖ Outdoor cats (both companion animals and strays) kill millions of songbirds and small mammals per year.
- ❖ Cats are not a natural part of ecosystems; they compete with native predators.
- ❖ Cats transmit disease to wildlife.
- ❖ Even well-fed cats hunt and kill wildlife.
- ❖ Bells do not prevent cats from killing wildlife.
- ❖ Interrupting an attack by a cat usually does not allow the prey to escape and live.
- ❖ Indoor cats live three times longer, on average, than outdoor cats.

Designing your Wildlife Garden

Whether you are ready for a total redesign of your property or prefer to take gradual steps towards a native wildlife garden, you will need a well-designed plan. This section will help you create a basic plan for your property. However, at some point you may wish to contact a landscape professional for more assistance.

“If one way be better than another, that you may be sure is Nature’s way.”

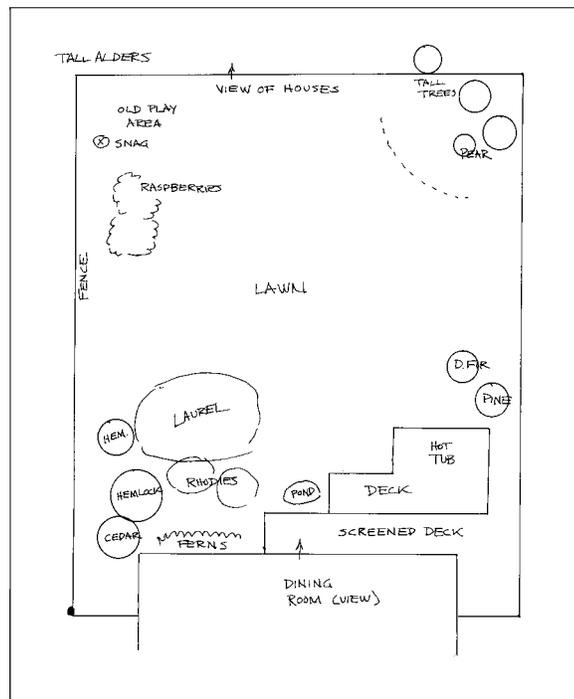
-Aristotle

Before doing anything, get out into your yard and have a look around. What do you see? Is your yard shady or sunny, your soil moist or dry? How many trees do you have, what kind of trees, and in what condition are they? Do you have a vegetable garden you love, or an apple tree that bears delicious fruit? How much lawn do you have, and how much of this do you really use? Are there any seasonal wet areas or steep slopes on your property? Repeat your investigations several times. Assessing your yard’s existing conditions is the first step towards designing your future wildlife habitat.

Draw a Base Map

Next, you need to sketch your property. (No artistic talent is required.) This will be your base map. You can use poster board or simply sketch on graph paper. The sketch should show your property from above.

1. Draw the impervious surface – your house, garage, and all paved areas.
2. Fill in mature trees and shrubs, including dead or dying trees.
3. Identify planted or landscaped areas, such as a vegetable or wildflower garden.
4. Include patches of invasive vegetation, such as ivy and blackberry brambles.
5. Show water sources of any type (ponds, streams).
6. Include brush piles, rock shelters, large stumps, and logs.
7. Show existing bird feeders, birdbaths, and nest boxes.
8. Identify the lawn.



Sample Base Plan - To transform their backyard into a wildlife sanctuary, Neil and Carleen Zimmerman used a base map to identify the existing structures, trees, and areas of use. They wanted to screen an intrusive view in the back, construct a new shed, add to the deck and viewing areas, and convert the large lawn to low-growing native plants. They screened the porch with a wire mesh that does not detract from the view, but keeps their two cats safely inside.

Your base map helps to identify existing conditions, and it also illustrates the connectivity and structure of your existing features and their value to wildlife. If you know your plants, you may wish to use a key diagram to identify different species of plants on your property, or make a list of the existing native species.

Design a Layout Plan

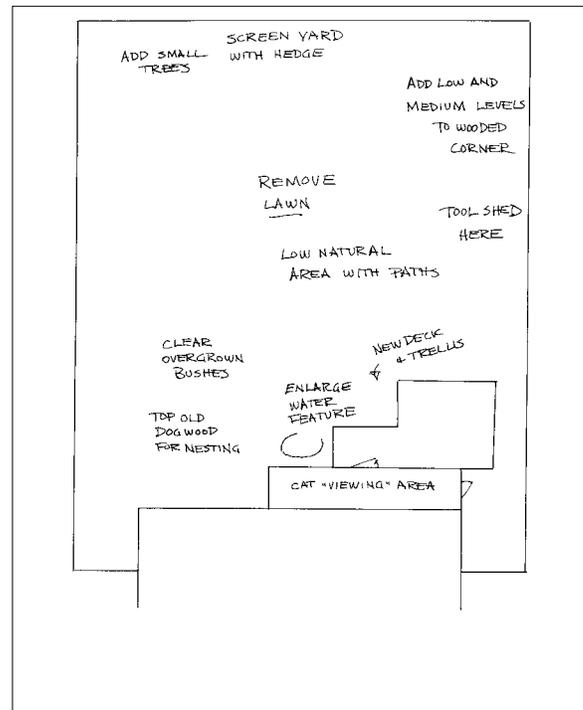
Make a number of photocopies of your base map. Now you can experiment with different garden scenarios. Use all the paper you need for this exercise – don't be shy about trying a new idea out on a piece of paper.

You might ask yourself some questions when designing your garden:

- ❖ If you have both a front and back yard, how do you use each one?
- ❖ How much lawn, if any, is needed for family recreation, pets, and entertaining? Concentrating high-use human activities into one or two designated areas will help maximize your undisturbed areas.
- ❖ What areas should be shielded for privacy? Do you have views to maintain, or obstructions such as utility lines?
- ❖ Can you allow for movement through the landscape? Might you include paths and benches for people to use the space and view the wildlife?
- ❖ Do you have, or want, wildlife features that will definitely attract birds, such as feeders, snags, brush piles and bird baths? Areas near windows, patios and porches are the best wildlife-viewing areas.



Layering the planting will attract a greater variety of birds to the yard.



Sample Layout Plan - To transform their property, the Zimmermans tackled one project at a time. They have many tall trees in the yard and around it, and wanted to add lower layers in the corners that would invite birds. The yard was screened with a tall photinia hedge. They added nest boxes and snags for cavity nesters (in one case, sawing a dead tree that had a nest hole in it so that it could be hinged and cleaned like a box.) They topped one of the trees, a dogwood, for perches and nesting area. They decided to remove a large overgrown laurel, trim the rhododendrons near the back windows, and add a brush pile. This opened up a feeding area that was easy to view from the dining room. A small artificial pond was enlarged to make a circulating "waterfall," and this stream was visually connected to a rocky path leading to a stunning driftwood piece in the center of the yard. The lawn was replaced with low growing native vegetation, and a pathway and stepping stones were added so that the feeders could be easily accessed.

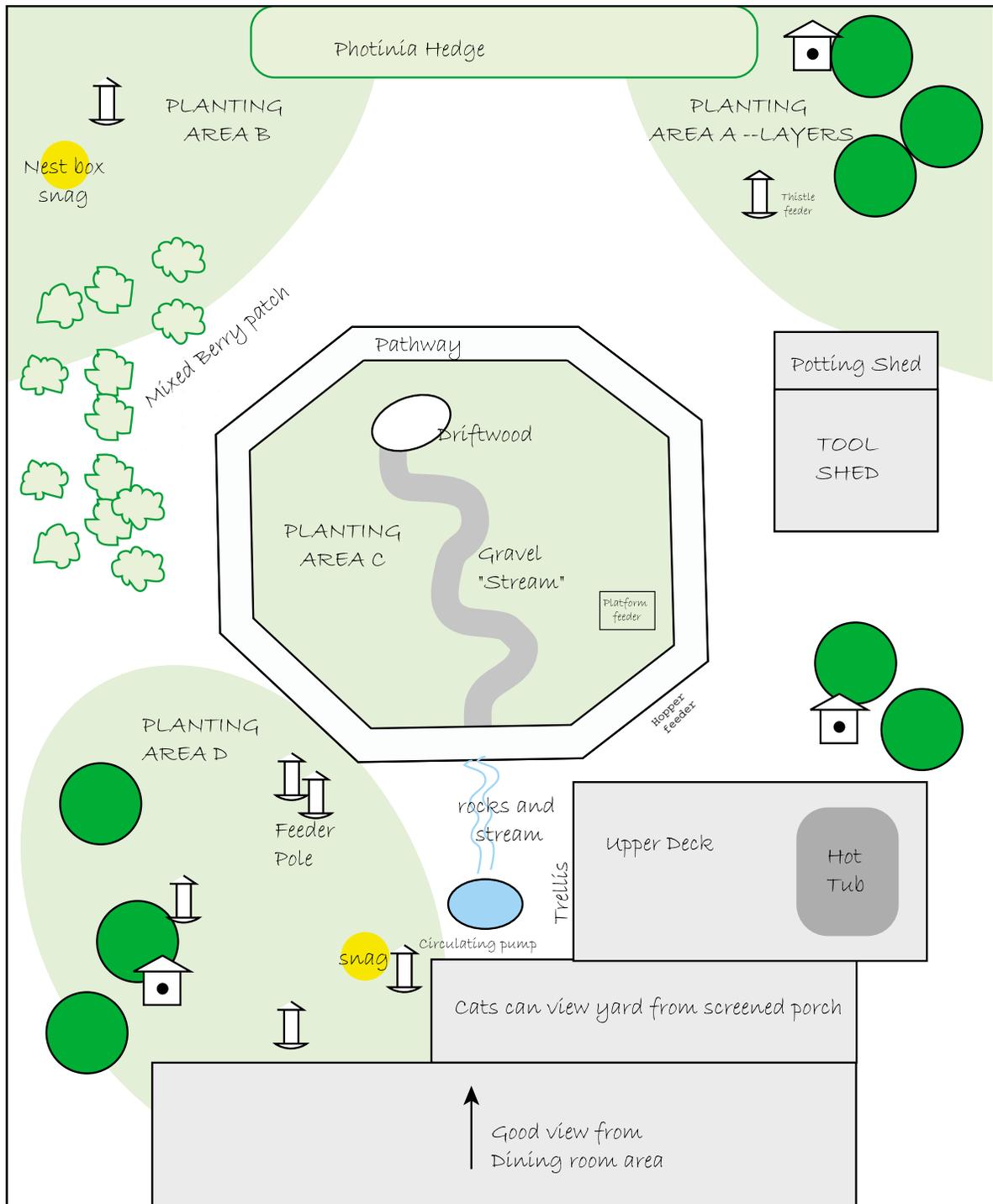
Create a Planting Plan

After creating a layout plan that you like, sketch a planting plan. This will let you experiment with plants on paper before anything goes into the ground. The plan may include specific species, location, spacing, and quantities. Some considerations:

- ❖ **Select your trees first** and determine where you want to plant them. Next, select shrub layer plants and finally your smaller plants and groundcover.
- ❖ **Select plants that will be attractive** to you and to native wildlife.
- ❖ **Choose plants that are well-suited** to the conditions of your property. Choose shade-tolerant plants for shady areas and the understory layer, and erosion-control plants for steep slopes.
- ❖ **Preserve existing native vegetation** if possible. Trees are especially valuable, and shrubs may provide food and cover for wildlife.
- ❖ **Plant with repetition.** Instead of the “one of everything” approach, plant several individuals of each species. This pleases the eye and is more likely to attract wildlife, as individuals of the same species often bloom together.
- ❖ **Provide cover,** giving wildlife the ability to hide. Avoid oversharing and overshaping your shrubs. Instead, let shrubs grow out a bit and touch each other.
- ❖ **Add layers.** Different wildlife species use different layers of vegetation. Every plant layer (groundcover, shrub, understory, and canopy) increases the diversity of wildlife in the garden.
- ❖ **Increase vertical and horizontal connectivity** to allow wildlife to travel up and down and in and out through the different layers of vegetation. Plant so that each layer connects somewhere to another layer.
- ❖ **Take your time.** You don’t have to do it all at once—work on one section at a time if that is more comfortable.

Opposite: *The planting plan of the yard to date. Although many of the plants are young, the birds find the landscape appealing. The Zimmermans have noted 67 species of birds in their yard, and at least nine species have nested there.*

See table on page 40 for a list of Northwest native plants highly recommended for wildlife-friendly landscaping.



Planting Plan

Area A – Shaded woodland corner.

Medium size trees: serviceberry, red alder, vine maple. Smaller shrubs and herbs: bracken fern, cape fuchsia, indian plum, Oregon grape, salal, salmon-berry, sword fern, twinberry

Area B – Transition area from tall trees beyond yard: vine maple, red-flowering currant, mungho pines, evergreen huckleberry, boysenberry, blueberry, indian plum

Area C – Low growth inside of walkway:

red-flowering currant, oxalis, deer fern, salal, huckleberry, kinnickinick, bearded iris.

Area D – Shady, tall trees (hemlock, cedar): transplanted moss with netting, Pacific rhododendron, salal.

		Evergreen	Deciduous	Grows anywhere	Dry soil	Moist soil	Prefers sun	Prefers shade	Catkins, leaves or seeds	Attracts insects	Nesting site (dead wood)	Nectar/pollen	Fruit	Attracts hummingbirds	Nectar butterfly or moth	Larval food butterfly or moth	
TREES	Vine maple	<i>Acer circinatum</i>	●			●			●			●					
	Big-leaf maple	<i>Acer macrophyllum</i>	●	●					●	●	●	●				●	
	Red alder	<i>Alnus rubra</i>	●			●			●	●					●		
	Pacific madrone	<i>Arbutus menziesii</i>	●		●		●					●	●	●		●	
	Pacific dogwood	<i>Cornus nuttallii</i>	●			●							●			●	
	Douglas fir	<i>Pseudotsuga menzeisii</i>	●				●		●	●	●					●	
	Scouler's willow	<i>Salix scouleriana</i>	●			●	●		●	●					●	●	
	Western red cedar	<i>Thuja plicata</i>	●					●	●	●	●						
SHRUBS	Serviceberry	<i>Amelanchier alnifolia</i>	●				●					●	●			●	
	Red osier dogwood	<i>Cornus stolonifera</i>	●			●						●	●			●	
	Salal	<i>Gaultheria shallon</i>	●	●								●	●			●	
	Tall Oregon grape	<i>Mahonia aquifolium</i>	●				●					●	●		●		
	Cascade Oregon grape	<i>Mahonia nervosa</i>	●					●				●	●		●		
	Indian plum	<i>Oemleria cerasiformis</i>	●					●				●	●		●		
	Mock orange	<i>Philadelphus lewisii</i>	●	●								●			●		
	Red-flowering currant	<i>Ribes sanguineum</i>	●		●							●	●	●			
	Thimbleberry	<i>Rubus parviflorus</i>	●	●								●	●		●		
	Red elderberry	<i>Sambucus racemosa</i>	●			●						●	●	●	●	●	
	Snowberry	<i>Symphoricarpos albus</i>	●	●								●	●	●			
	SUBSHRUBS AND GROUNDCOVERS	Vanilla leaf	<i>Achlys triphylla</i>			●											
		Pearly everlasting	<i>Anaphalis margaritacea</i>					●					●		●		
		Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	●		●		●					●			●	●
Wild ginger		<i>Asarum caudatum</i>	●			●		●									
Lady fern		<i>Athyrium filix-femina</i>	●			●		●									
Deer fern		<i>Blechnum spicant</i>	●			●											
Bunchberry		<i>Cornus canadensis</i>				●						●				●	
Pacific bleeding heart		<i>Dicentra formosa</i>				●						●		●			
Fireweed		<i>Epilobium angustifolium</i>					●					●		●	●		
Twinflower		<i>Linnaea borealis</i>	●					●				●					
Fringecup		<i>Tellima grandiflora</i>	●			●											
Sword fern		<i>Polystichum munitum</i>	●	●													

Make Your Own Community Healthier

John Muir is supposed to have said that every time you pick up a stick you find it hooked to everything in the universe. You needn't think as cosmically as Muir to see how the choices you and your neighbors make in your own yards and neighborhoods affect the environment for salmon and wildlife and the health of your own friends and family. So do your community's landscape practices in its parks, roadside and greenbelts.

Insist that agencies cut back on pesticide use

Scientists have tested scores of streams, lakes and rivers in our region. And in almost every water body they tested, they have found pesticide contamination. Chemicals used by cities, agriculture, homeowners, schools, and businesses routinely find their way into surface water. (In fact, urban and suburban pesticides find streams more easily than agricultural ones, due to the prevalence of concrete and asphalt to carry them along.) Most Northwest cities and counties still use pesticides in managing their properties, including parks and roadsides. However, growing community support for healthier habitats has led some cities and counties to cut back or even stop using the most toxic pesticides.

What you can do:

Your local government's change to healthier pest management practices can begin with the concerns of just a few people. Here are some steps you can follow to reduce pesticide pollution in your community.

Research the problem. Through the parks or public works department, learn about your local government's pesticides policy and decisions structure. Also, try to find out what pest problems are common in your community, which pesticides are being used, and their health effects.



Build community support. Develop a core group of supporters to launch your campaign; a group will be more effective than one individual. Talk it over with friends, neighbors, and community organizations, as well as local groups interested in children's health and wildlife issues.



Define your platform. Before you approach your local public agencies, figure out exactly what it is you want them to do. Based on their current pest management practices and the threats they pose, your requests might sound like this:

- Phase out the most toxic pesticides.
- Use pesticides only for documented pest problems and never just for aesthetic purposes.
- Use proven alternatives to pesticides and reduce overall pesticide use.
- Identify some parks to be 100% pesticide-free.
- Notify the public by posting signs in advance of any pesticide application on public land, and leave the signs in place for at least one week after.

(continued.....)

The growing concern for salmon recovery has further prompted cities and counties to reduce pesticides. We in the Northwest honor the salmon as a part of our identity, culture and environmental heritage, and yet twenty-six salmon runs are now listed under the federal Endangered Species Act. Lab research shows that some pesticides might kill salmon directly, although this is not confirmed by field research; it is still more likely that one or more pesticides affects some salmon's sense of smell, which could diminish their "homing" ability, predator avoidance, or breeding success. Pesticides also affect the availability of some prey for salmon.

Encourage Habitat Restoration and Native Landscaping

Habitat restoration projects and native plant landscaping at city parks, libraries, and businesses are a growing, positive trend in communities around Puget Sound. One by one and especially collectively, such projects help restore the healthy ecology of our urban areas.

Restoring pieces and parts of our natural environment can begin or speed up the recovery of a whole ecosystem. Often, citizens can find outside funding to pay for the important work of reviving the habitat and ecological functions of a special place, such as a neighborhood park or creek. Such grants often pay for plants, restoration tools, and signs. Grants for large projects may provide money to hire staff, such as a landscape architect or volunteer coordinator.

What you can do (continued):

Advance your agenda. Meet with city staff and decision makers to introduce your platform. Do your best to win over staff responsible for pest management early in the policy-design process, if you can; this increases your chance of success. Support your case by citing concrete examples of successes with such policies in other jurisdictions.



Find a champion among the decision makers. Next, meet with decision makers (usually city council members), focusing first on individuals who are likely to support you, as they can then help influence other council members. (You may find the key decision maker in local departments such as Public Works or Parks and Recreation.)



Develop and implement a plan for your campaign. Consider the following elements: creating your message and having it understood; lobbying the decision makers; attracting media coverage; reaching out to the whole community;

and building coalitions. (*The Activist Toolkit has more information on all aspects of a grassroots campaign. See the Resources section*)



Take your proposal to the city or county council. Your goal is to get your local government to adopt a healthy community pest-management policy. By this time you should know you have the votes to pass it, have speakers ready to testify at the public comment hearing, and have citizens ready to pack the room.



Inform the public of the outcome. Whether the council passes or rejects your plan, use your local media to let the public know about your campaign, and to influence your targets.



Keep an eye on follow-through. A healthy pest management policy works only if the city or county really follows it. Maintain good relationships with city staff. Anticipate future efforts to weaken the policy. Ongoing vigilance and public support are essential.

New public buildings, public landscape projects, and vegetation management in city parks give citizens splendid opportunities to incorporate native plants for a more wildlife-friendly landscape. Parks and public buildings often have their landscaping contracted out to professional architects, who may not have the interests of wildlife in mind. Typical commercial landscaping consists of a few exotic “industrial horticulture species,” and often requires heavy watering, chemical pesticides and fertilizers. This cookie-cutter approach to landscaping too frequently demands high maintenance and rarely supports much wildlife. In Seattle, citizens successfully lobbied the parks department to incorporate native plants as much as possible into their vegetation plan for Magnuson Park. In Shoreline, after a citizen diligently worked with decision makers, the county used native plants to landscape a new library.



What You Can Do:

Volunteer for a habitat restoration project in your community. Community calendars in local newsletters and weeklies are full of them. Contact the project coordinator to confirm the work party. Ask how strenuous the tasks are, what clothes you should wear, and what to bring with you.



Start your own habitat restoration project to restore a creek, wetland, or park in your neighborhood. King County’s Wild Places for City Spaces program offers grants for urban restoration projects. Recipients may include organizations, community groups and government agencies. Seattle’s Department of Neighborhoods also makes grants for similar projects. *For information on these and other habitat restoration funding programs, see the Resources section.*



Persuade public landscape projects to go native. Contact your parks or public works departments, school district, or local

library system to find out if they have a policy about planting natives in new landscaping projects. Learn what projects are coming up that you might be able to influence. Volunteer to work with the architect in providing a list of native plants to consider. Contact Seattle Audubon or the Washington Native Plant Society for advice and help.



Teach your neighbors. Coordinate a Gardening for Life Workshop for your neighborhood group or host a natural landscaping party. Contact Seattle Audubon for a guest speaker. *See the Resources section.*



Publicize your successes! Inspire others with tales of your success and leverage your early victories to build an increasingly stronger platform. You’ve earned some praise!

Contributors

Lauren Braden is Seattle Audubon's Advocate for Wildlife Habitat. She organizes citizens to advocate for the protection of birds and habitat in the urban area, coordinates the naturoscaping program called *Gardening for Life* and researched and wrote the Activist Toolkit.

Bob Simmons is a Seattle citizen activist and freelance writer with nearly 50 years in professional journalism for print and broadcast, most of it relating to land and its uses.

Jennifer Leach (photographer) has been a freelance photographer for ten years. She is currently studying wildlife science at the University of Washington.

Marilyn Milberger (book design, illustration) is an artist and graduate of the Seattle Audubon Master Birder program.

Tess Present is an ecologist, marine scientist and avid gardener. She is the Director of *Audubon At Home*, National Audubon's new program to engage the public in improving the environmental health and habitat quality of backyards and community spaces.

Contacts and Resources

Organizations:

Seattle Audubon Society

Protecting birds and the natural environment by involving volunteers and the community in education, advocacy, preservation, science and enjoyment
8050 35th Ave NE
Seattle, WA 98115
(206) 523-8243
www.seattleaudubon.org

National Audubon Society

Dedicated to protecting birds and other wildlife and the habitat that supports them
700 Broadway
New York, NY 10003
(212) 979-3000
www.audubon.org

Northwest Coalition for Alternatives to Pesticides

Protecting people and the environment by advancing healthy solutions to pest problems
PO Box 1393, Eugene OR 97440
(541) 344-5044
www.pesticide.org

Seattle Tilth

Hands-on education about organic gardening, supporting local farms, and more
4649 Sunnyside Avenue North, Room 1
Seattle, Washington 98103
(206)633-0451
www.seattletilth.org

Washington Native Plant Society

Provides botanical expertise and opportunities for all to share in the enjoyment of Washington's native flora
7400 Sand Point Way NE
Seattle, WA 98115
(206) 527-3210
www.wnps.org

Washington Toxics Coalition

Promotes alternatives, advocates policies, empowers communities, and educates people to create a healthy environment
4649 Sunnyside Ave N Suite 540
Seattle, WA 98103
(206) 632-1545
www.watoxics.org

WSU Cooperative Extension in King County

Comprehensive resource for information about gardening, farming, pesticides, environmental stewardship, native plants, water conservation, and more
Department of Natural Resources and Parks
919 SW Grady Way, Suite 120
Renton, WA 98055-2980
(206) 205-3100
<http://ext.wsu.edu/ce.cahe/programs/contents.html>

Government Contacts:

U.S. Environmental Protection Agency Office of Pesticide Programs

Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460
www.epa.gov/pesticides

King County

Hazardous Waste Management Program
Least toxic pest control, natural lawn care, pesticide disposal
(206) 263-3064
<http://www.metrokc.gov/hazwaste/house>

City of Seattle

Office for Sustainability and Environment
Pesticide Reduction Program
(206) 615-0817
<http://www.cityofseattle.net/environment/pesticides.htm>

References and Further Reading

The following booklets may be ordered by mail or downloaded free of charge:

The Activist Toolkit: A Citizen's Guide to Protecting the Environment

Published by the Seattle Audubon Society, 2000
(206) 523-8243 x14

<http://www.seattleaudubon.org/Conservation/ConservationActivism/ActivistToolkit.html>

Growing Trends: Successful Strategies for Reducing Pesticides in Public Places

A Washington Toxics Coalition Report, 2002
(206) 632-1545

www.watoxics.org

Pesticide Action Kit

Published by the Clean Water for Salmon Campaign, 2002

541-344-5044 ext. 17

<http://www.pesticide.org/SalmonActionKitNews.html>

The Maritime Northwest Garden Guide

Planning Calendar for Year-Round Organic Gardening

Published by Seattle Tilth

(206) 633-0451

<http://www.seattletilth.org/gardenguide.html>

Books:

American Wildlife and Plants, A Guide to Wildlife Food Habits

Alexander C. Martin, Herbert S. Zim and Arnold L. Nelson

Dover Publications, 1961

Bird Gardens: Welcoming Wild Birds to Your Yard

Stephen W. Kress, ed.

Brooklyn Botanic Garden, Inc, 21st Century Gardening Series, 1998

Birds of North America

Kenn Kaufman

Houghton Mifflin Company, 2000

The Butterflies of Cascadia

Robert Michael Pyle

Seattle Audubon Society Publishing, 2002

Dragonflies of Washington

Dennis Paulson

Seattle Audubon Society Publishing, 1999

Gardening with Native Plants of the Pacific Northwest

Arthur R. Kruckeberg

University of Washington Press, 1996

Going Native: Biodiversity in Our Own Backyards

Janet Marinelli, ed.

Brooklyn Botanic Garden, Inc, 21st Century Gardening Series, 2000

Growing and Propagating Wild Flowers

Harry R. Phillips

University of North Carolina Press, 1985

Hummingbird Gardens: Turning Your Yard into Hummingbird Heaven

Stephen W. Kress, ed.

Brooklyn Botanic Garden, Inc, 21st Century Gardening Series, 2000

Insects and Gardens

Eris Grissell

Timber Press, 2001

Invasive Plants: Weeds of the Global Garden

John M. Randall and Janet Marinelli, eds.

Brooklyn Botanic Garden, Inc, 21st Century Gardening Series, 1996

Landscaping for Wildlife in the Pacific Northwest

Russell Link

University of Washington Press, 1999

Mammals of the Northwest

Earl Larrison

Seattle Audubon Society, 1976

National Audubon Society: The Bird Garden

Stephen W. Kress

Dorling Kindersley, 1995

The Natural Habitat Garden

Ken Druse

Clarkson Potter publishers, 1994

Noah's Garden

Restoring the Ecology of our Own Backyards

Sara Stein

Houghton Mifflin Company, 1993

The Once and Future Forest: A Guide to Forest Restoration Strategies

Leslie Jones Sauer

Island Press, 1998

The Orchard Mason Bee

Brian Griffin

Knox Cellars Publishing, 1993

Redesigning the American Lawn:

A Search for Environmental Harmony (2nd ed.)

Herbert F. Bormann, Diane Balmori, and Gordon T. Geballe.

Yale University Press, 2001

Roadside Use of Native Plants

Bonnie L. Harper-Lore and Maggie Wilson, eds.
Island Press 2000

Stalking the Wild Amaranth:**Gardening in the Age of Extinction**

Janet Marinelli

Henry Holt and Co. 1998

The Wild Lawn Handbook:**Alternatives to the Traditional Front Lawn**

Stevie Daniels

Macmillan: Hungry Minds, Inc. 1997

Web Resources:**National Audubon Society,****Audubon At Home program:**

http://www.audubon.org/bird/at_home

American Community Gardening Association

offers numerous resources, many free-of-charge,
for starting and supporting a community garden:

<http://www.communitygarden.org/index.html>

Beyond Pesticides

state-by-state listing of pesticide issues and
resources:

<http://www.beyondpesticides.org/main.html>

Brooklyn Botanic Garden**Gardening Information web page:**

<http://www.bbg.org/gar2/>

**Cooperative State Research, Education, and
Extension Service Directory of state partners:**

<http://www.reeusda.gov/statepartners/usa.htm>

Earth 911

search by zip code to find local recycling centers,
hazardous waste disposal sites, and other home
and community conservation resources

<http://www.earth911.org>

National Pesticide Information Center

General Pesticide Information web page provides
objective, science-based information on a wide
variety of pesticide-related subjects:

<http://npic.orst.edu/gen.htm>

OR call toll-free, 1-800-858-7378 6:30 a.m. to
4:30 p.m. Pacific time, 7 days a week, excluding
holidays

**Native Plant Societies of the United States and
Canada**

list compiled and posted by the Michigan
Botanical Club:

[http://michbotclub.org/links/
native_plant_society.htm](http://michbotclub.org/links/native_plant_society.htm)

Plant Native

Dedicated to moving native plants and
naturescaping into mainstream landscaping
practices

www.plantnative.com

**United States Department of Agriculture,
Natural Resources Conservation Service,
Backyard Conservation:**

<http://www.nrcs.usda.gov/feature/backyard/>

**United States Department of Agriculture,
Natural Resources Conservation Service Plants
Database—Invasive & Noxious data report**

provides Federal and state noxious weed lists, an
invasive plant list, and an introduced plant list,
each with links to further information:

http://plants.usda.gov/cgi_bin/noxious.cgi#contents

**United States Environmental Protection Agency,
Office of Pesticide Programs:**

<http://www.epa.gov/pesticides/>

**WaterWiser, The Water Efficiency
Clearinghouse:**

<http://www.waterwiser.org>

Birds of Seattle's Parks and Gardens

A partial list of birds to look for in the city

Pied-billed Grebe	Red-breasted Nuthatch
Double-crested Cormorant	Winter Wren
Great Blue Heron	Bewick's Wren
Mallard	Marsh Wren
Northern Shoveler	Golden-crowned Kinglet
Gadwall	Ruby-crowned Kinglet
American Wigeon	American Robin
Sharp-shinned Hawk	Cedar Waxwing
Cooper's Hawk	European Starling
Red-tailed Hawk	Hutton's Vireo
Merlin	Warbling Vireo
California Quail	Orange-crowned Warbler
American Coot	Yellow-rumped Warbler
Killdeer	Yellow Warbler
Band-tailed Pigeon	Wilson's Warbler
Rock Dove	Common Yellowthroat
Anna's Hummingbird	Spotted Towhee
Rufous Hummingbird	Savannah Sparrow
Downy Woodpecker	Song Sparrow
Pileated Woodpecker	Golden-crowned Sparrow
Northern Flicker	White-crowned Sparrow
Tree Swallow	Dark-eyed Junco
Violet-green Swallow	Red-winged Blackbird
Cliff Swallow	Brewer's Blackbird
Barn Swallow	Brown-headed Cowbird
Steller's Jay	House Finch
American Crow	Pine Siskin
Black-capped Chickadee	American Goldfinch
Chestnut-backed Chickadee	Evening Grosbeak
Common Bushtit	House Sparrow

