



Hedgerows for Biodiversity

Habitat is needed to protect pollinators,
other beneficial organisms, and healthy ecosystems

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(Eds note. Hedgerows, a planted border or divider between managed or built land areas, in urbanized, rural, and agricultural environments, provide important habitat for all kinds of organisms, supporting ecosystem balance. This is an especially important tool in the face of habitat decline, given fence row to fence row cultivation practices in agriculture, manicured lawns and landscapes, urban sprawl, and the use of broad spectrum pesticides that threaten the diverse organisms that make up a healthy ecosystem. With severe loss in recent years of pollinators, including bees, butterflies, and birds, natural and diverse hedgerows take on a new importance in nurturing and restoring populations in decline. Of course, hedgerows alone will not counterbalance the widespread use of systemic pesticides that are poisoning food sources (pollen, nectar, guttation droplets, earthworms and insects) that various pollinators depend on as a clean food source, but they can be a critical tool in slowing pollinator decline and creating zones of protection until land managers (agricultural and nonagricultural) make the shift to sustainable practices that protect biodiversity. – JF)

What Are Hedgerows?

Hedgerows, or hedges, come in many forms and serve a number of different purposes. The celebrated hedgerows of Britain served as fences for livestock. The urban/suburban hedge marks a boundary and provides privacy. As a response to the Dust Bowl, hedgerows

were planted throughout the Great Plains to act as windbreaks, preventing soil erosion. Other hedges are planted just for their ornamental value. There are many benefits to planting hedges – woody vegetation helps sequester carbon, thus mitigating global warming; they can provide a source of food for humans, including nuts, berries, and wild mushrooms; they provide shade, which can relieve heat stress on domestic and wild animals and provide added diversity of plant habitat; they can provide firewood; and they act as a refuge for predators and parasites of “pest” species.

Whatever the primary reason for planting a hedge, it can also support biodiversity. Even a highly manicured privet hedge provides shelter, nesting sites, and berries for birds, as well as some nectar for bees and other pollinators. However, hedgerows planted with biodiversity in mind can do much more.

At the opposite extreme from the manicured ornamental and often flowering (e.g., privet) hedge is the mature windbreak. Windbreaks have multiple rows from low-growing shrubs to trees so that they can block wind, redirecting it up and over the windbreak in the winter or cooling it as it filters through in the summer. Over time, other species of plants arrive via wind, birds, squirrels, and other animals, and the windbreak begins to resemble the edge of a forest.

Edges –where two environments meet– provide high habitat and species diversity. All hedges –even the privet hedge surrounding a lawn– are edges. Hedges can be planted and managed to maxi-

mize biodiversity and the benefits that biodiversity brings. If they join existing habitats—for example, woodlands, grasslands, and riparian zones along rivers—they provide corridors for movement of animals and other organisms. Such a corridor effectively increases the habitat size for species that could not survive in a small island of habitat isolated from others.

Biodiversity Benefits of Hedgerows on Farms

The flowering plants in hedgerows—from flowering herbaceous plants (or forbs) to shrubs to trees—can provide nectar and pollen over the entire growing season. This season-long supply helps to bridge the gaps when cultivated plants are not blooming. While honey bees can live off of stored honey and pollen, most pollinators do not store food and require a constant supply. Without a constant supply, they will go elsewhere. Among these pollinators are the parasitoids that attack caterpillars and other “pests,” such as tachinid flies and parasitoid wasps. They also rely on nectar as food in their adult stages. A number of predaceous arthropods are also found in hedgerows, including bigeyed bugs, syrphid flies, predatory wasps, lady beetles, minute pirate bugs, lacewings, and spiders. Many insectivorous birds eat berries when the insect supply is low, so hedges that include berry-producing trees and shrubs can help maintain populations of birds like the Eastern phoebe who help to keep insect populations below troublesome levels. Among the many insects consumed by these predators and

Guidelines for Planting a Hedgerow

- Choose plants that meet multiple goals, including plants you like.
- Prepare the site well ahead of planting—in summer or fall.
- Plant in late fall, winter or early spring, depending on your location.
- Think diversity—plant fast growing and slow growing, tall and short, evergreen and deciduous, a variety of blooming times.
- Be prepared to give extra attention to the plants until they are established.

parasites are aphids, mealy bugs, leaf hoppers, scales, mites, whiteflies, lygus bugs, thrips, squash bugs, stink bugs, codling moths, corn earworms and other caterpillars.

Trees in hedgerows provide nesting and roosting sites for hawks and owls, whose rodent prey are a perennial concern of farmers. Mammalian predators of rodents like coyotes, foxes, and weasels also like the shelter of hedgerows. Insectivorous birds and bats may find nesting sites in hedgerows. These include the least flycatcher, red bat, hoary bat, Carolina wren, Eastern screech owl, which

nest in trees; gray catbird, brown thrasher, yellow-breasted chat, and indigo bunting, which nest in shrubs; and rufous-sided towhee, field sparrow, and song sparrow, which nest on the ground. Snakes and other reptiles that prey on insects and rodents also choose the forest edge habitat. They include the Eastern garter snake, rough green snake, mole king snake, milk snake, Eastern coachwhip, and five-lined skink.

Biodiversity Benefits of Urban/Suburban Hedges

Even the manicured privet hedge can offer some minimal biodiversity benefit. However, an urban hedge that is maintained with biodiversity in mind can do much more. The urban hedgerow will probably not include trees, so it would not attract those species that nest or roost in tall trees. However, with a careful choice of plants, the urban hedgerow can provide a steady supply of nectar

for pollinators as well as predators and parasitoids, and nesting sites and shelter for birds, including those who eat garden “pests.” It can provide berries as an alternative source of food for insectivorous birds. It can also be a pleasing feature that attracts birds and butterflies.

Planting and Managing a Hedgerow for Biodiversity

“The best time to plant a tree is 20 years ago; the second-best time is now.”—Chinese proverb

The design of a hedgerow depends on how much space is available and the functions it must serve. The following section will address the farm windbreak/refuge hedgerow and the urban hedge that provides privacy and attracts pollinators. Other related designs are possible.

Planting and Managing a Farm Windbreak for Biodiversity

Windbreaks are tall and dense. They protect



Urban vineyard with pollinator hedgerow, photo by Patricia Algara, BASE Landscape Architecture.

Hedgerows in Organic Production

Hedgerows provide a simple and effective way for organic producers to promote biodiversity, as required by organic regulations.

Organic production is defined by the National Organic Program (NOP) regulations as, “A production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.” The preamble to the rule explained that, “The use of ‘conserve’ establishes that the producer must initiate practices to support biodiversity and avoid, to the extent practicable any activities that would diminish it. Compliance with the requirement to conserve biodiversity requires that a producer incorporate practices in his or her organic system plans that are beneficial to biodiversity on his or her operation.” In addition, organic producers are required to “use management practices to prevent crop pests, weeds, and diseases.”

The importance of conserving biodiversity on organic farms has been repeatedly stressed by the National Organic Standards Board (NOSB). At its fall 2009 meeting, the NOSB unanimously approved a recommendation that called for (1) explicit incorporation of bio-

diversity into questions asked in reviewing substances for the National List of Allowed Synthetic Substances, and (2) the adoption of measures to promote biodiversity conservation by producers, inspectors, certifiers, and the NOP. Some of the measures have been implemented while others have not. As of June 10, 2014, the NOP has put biodiversity guidance on hold, but according to NOP instruction, an organic farmer’s Organic System Plan (OSP) must describe practices designed to maintain or improve biodiversity. Some certifiers have adopted guidance created by the Wild Farm Alliance (WFA) for evaluating the adequacy of a farmer’s OSP. The use of hedgerows figures prominently in the WFA guidance.

Despite the support of the NOSB for biodiversity, not all organic farmers incorporate hedgerows or other sources of biodiversity into their farms. Indeed, comments to the NOSB suggest that not all certifiers are clear about the requirements. When organic farmers do not sufficiently support biodiversity, their need for other inputs is increased. This appears to happen most frequently when operations transition from industrial scale non-organic practices, but there are organic farms of all sizes that do not provide for the needs of wildlife. Hedgerows require dedicated land and an investment of time and capital for establishment, but they (or equivalent biodiversity support) should be required as part of the transition process.

farmsteads and crops from wind damage and damage from agricultural chemicals that might be carried in dust particles. Windbreaks that are designed to protect from winter winds need to have more evergreens than those designed to protect from drying winds and dust in the summer. A winter windbreak would have at least two rows of evergreen trees and a row of deciduous trees or shrubs. A summer windbreak would have at least one row of tall deciduous trees and a row of deciduous shrubs. Typically, rows of trees and shrubs are planted at least 10-15 feet apart to leave room for trees to grow. To serve as a source of nectar for pollinators, the windbreak should also contain perennial herbaceous plants, which can be planted more closely. The biodiversity benefits will be multiplied if the hedgerow connects existing patches of woodland, and especially if it makes the connection to a riparian zone or other source of water.

The choice of species depends on your location. Native species generally become established, serve native pollinators and other animals, and are less likely to interfere with other plants. State forestry departments or extension programs can recommend trees and shrubs that are suitable for windbreaks and wildlife. Some sell seedlings at a reduced

price for windbreaks and wildlife plantings. See the Resource section for help in finding appropriate plants for hedgerows.

Planting and Managing an Urban Hedge for Biodiversity

Some ways that the urban hedge biodiversity benefits can be increased are: linking the hedge to trees, water sources, woodland habitat or neighboring hedges; choosing shrubs that provide nectar and fruit; including a variety of shrubs that flower and fruit over the growing season; merging the hedge into a planting of perennial flowering plants that provide nectar over the entire growing season; and avoiding the use of pesticides, including herbicides targeting dandelions, an important early season nectar source. Choose plants that are appropriate for your area. The flowering plants can also include annuals and biennials, especially those in the family Umbelliferae (such as coriander, dill, fennel, parsnip, parsley, and carrots), which are very attractive to pollinators.

Resources

BEE Protective Habitat Guide <http://bit.ly/BeePHabitatGuide>

Pollinator-Friendly Seeds and Nursery Directory <http://www.beyondpesticides.org/pollinators/seed.php>

Hedgerows for California Agriculture (Mostly specific to California, but contains general information about planting hedgerows) http://www.goldridercd.org/project/pollinators/CAFF_hedgerows-4-CA-ag.pdf

Xerces Society Pollinator Conservation Resource Center <http://www.xerces.org/pollinator-resource-center>

Bee Friendly Plant lists: <http://www.xerces.org/providing-wildflowers-for-pollinators>

Habitat Installation Guides: <http://bit.ly/XercesHabitatInstall>

A guide to finding native plants <http://findnativeplants.com>

Community Alliance with Family Farmers Hedgerow information (CA) <http://caff.org/programs/bio-ag/hedgerows>

California Plants for Native Bees http://www.goldridercd.org/project/pollinators/CA_plants_for_native_bees.pdf