Management of Hedgerow Buffer Zones to Promote Bird Habitat

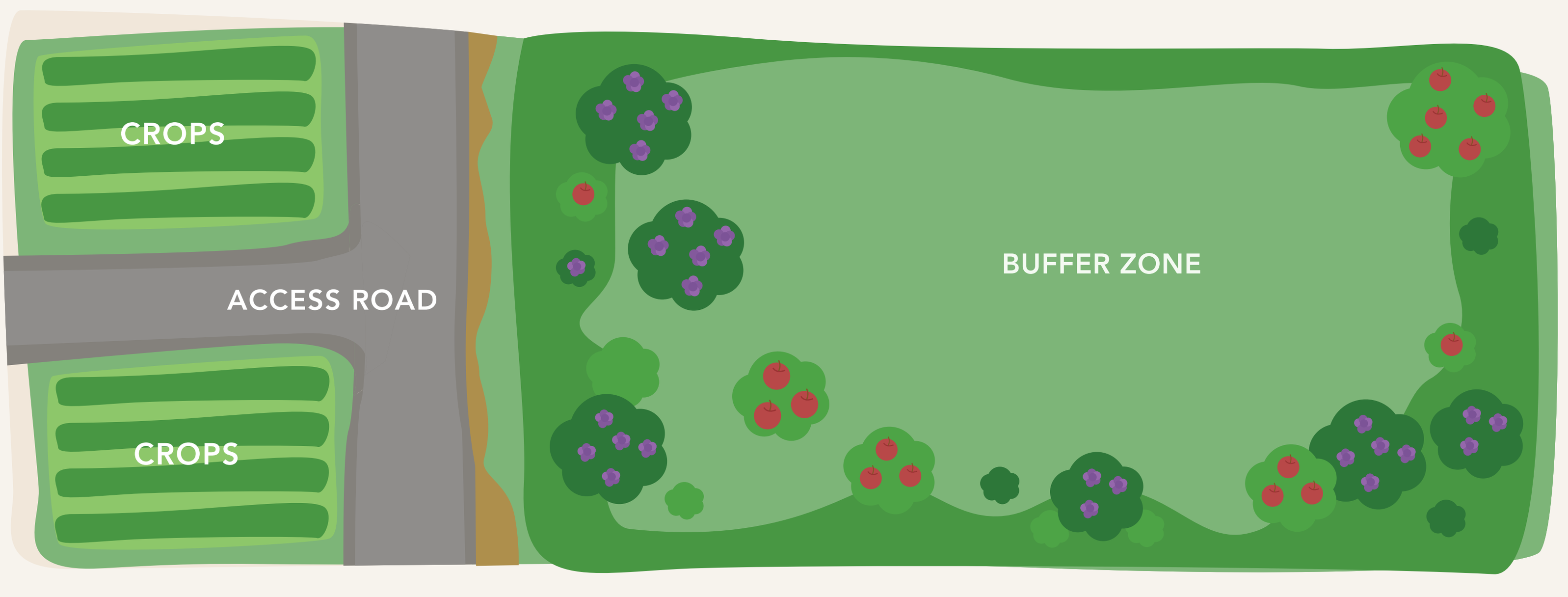
It is awfully hard to share the experience of an early morning on a farm.

Glittering specks of plants covered in dew. An endless sky of oranges, pinks, blues and greys. The joyful calls of birds, mixing for a powerful soundtrack of song.

The use and management of buffer areas to promote bird habitat requires attentive management practices to not only create, but also maintain healthful bird populations. But why does having birds on the farm even matter? Studies have shown that an increase in bird diversity—raptors, songbirds and other landbirds—provides an ecosystem service for pest removal and mitigation. These benefits can be brought to the farm by creating and maintaining buffer zones—an important and necessary tool for organic farmers meeting regulatory standards—that feature hedgerow "natural" habitat areas to entice desired bird populations[1].

Knowing how to choose the location, size and elements of a buffer zone hedgerow habitat can lead to successful increases in bird diversity and benefits for many farms.

Minimize Habitat Fragmentation

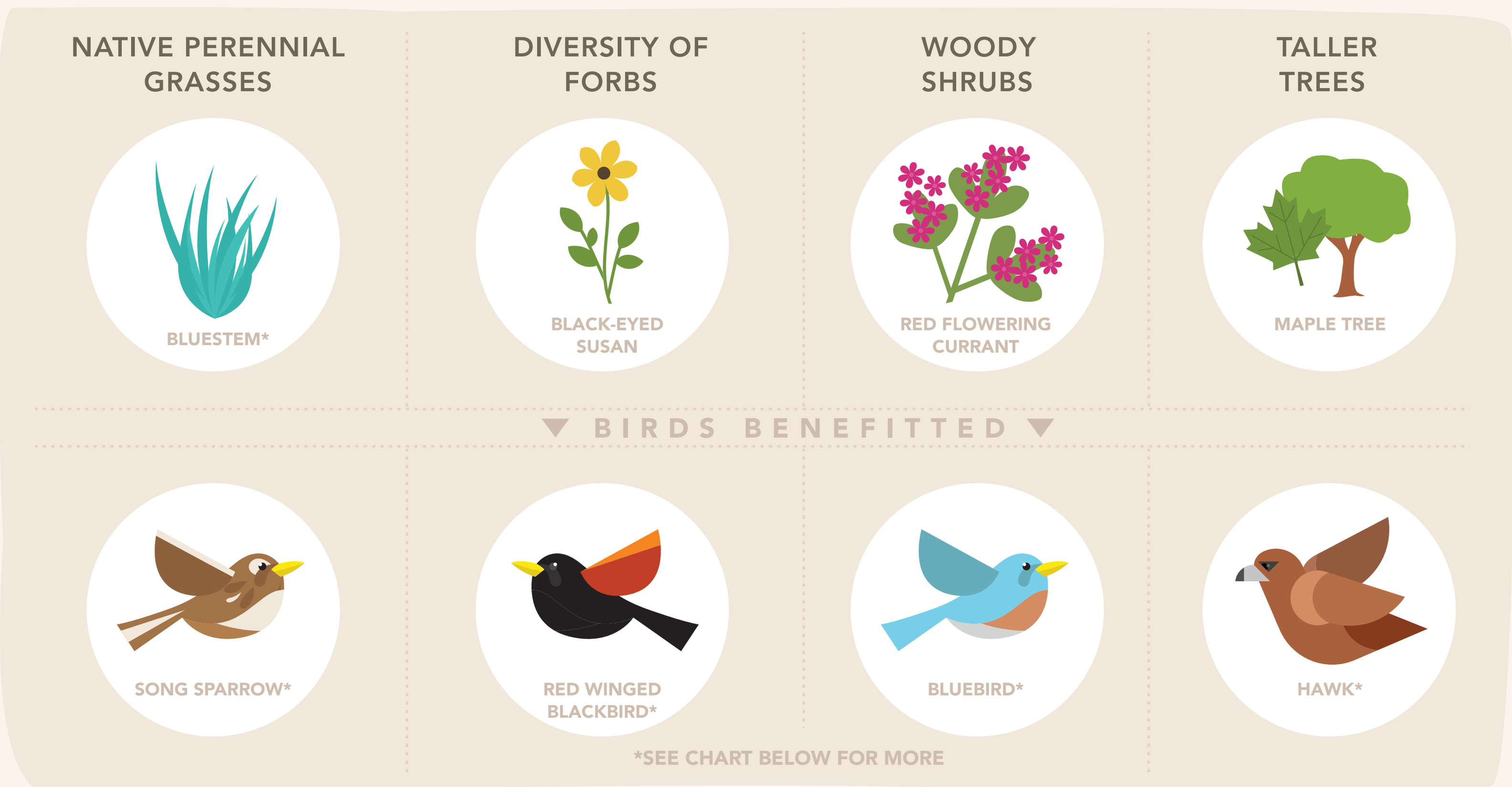


A WELL-MAINTAINED BUFFERZONE

Site selection will be dictated by where the need is for a buffer area—non-cropped areas alongside roadways, neighboring field borders and agricultural drains—and accessibility for equipment and other management tools (irrigation, etc.).

It is best to develop buffer areas that are continuous. A patchwork system of non-cropped areas as well as sudden linear edges from long, narrow rectangular blocks do not provide adequate diversity of habitat conditions. If and when possible, using irregular borders that are wide enough (30+ feet)[2] to prevent predation. When buffers are fragmented, many ground birds and grassland birds are subjected to nest predation from crows, jays, skunks, raccoons, opossums, foxes, and cats. Use of an irregularly edged and non-fragmented hedgerows—groups of trees, shrubs, perennial forbs, and grasses that are planted along roadways, fences, field edges or other non-cropped areas[3]—combines need (ex. mitigate erosion and runoff) with bird-friendly habitat design. Researchers with UC Cooperative Extension and Audubon California, found that such hedgerow plantings tripled bird abundance and doubled bird species richness, but did not increase the bird abundance in the adjacent crops.[4]

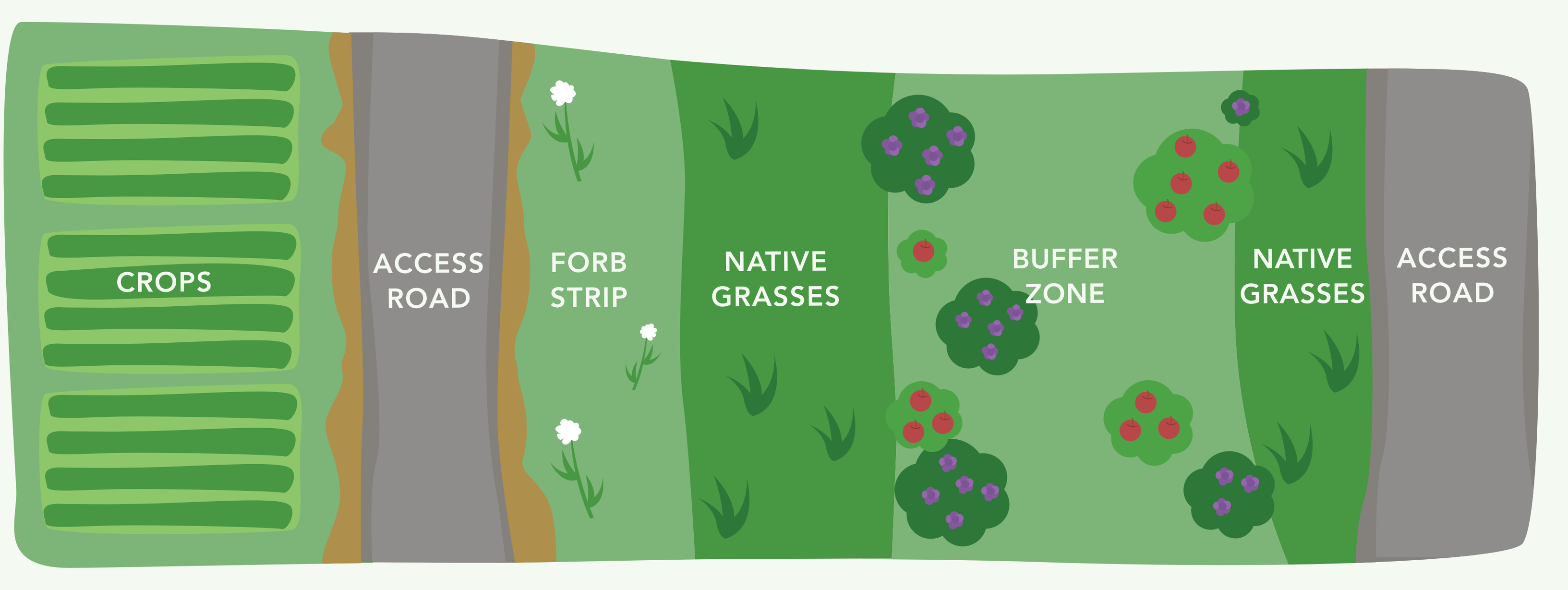
The Elements of a Hedgerow Habitat



The right height, amount of residual vegetation, and grass/ forb combination is critical to establish a diversity of birds. Each species requires different vegetative structure and composition in order to construct a nest. The following basic elements of a native hedgerow habitat provides environmental structure and food sources for several bird species:

Environmental structure	Birds benefitted	Regional options
Native perennial grasses Secure the soil through the establishment of a deep root system.[5] Provides a place for several bird species for breeding, courtship, nesting, foraging, rearing young, and roosting. Allows for key habitat for birds to provide a valuable pest removal service on farms.[6]	Dickcissel, song sparrow, horned lark, upland sandpiper, eastern meadowlark, bobolink, and field/savannah sparrows	**East:** Indian grass, bluestems (big and little), switchgrass **Midwest:** bluestems, indiangrass, switchgrass, Eastern gamagrass **West:** bluestems, fescues, reedgrasses, needle grasses **South:** bluestems, Indiangrass, switchgrass, Eastern gamagrass
Diversity of forbs An assortment of forbs (herbaceous plants) will provide a steady source of nectar and pollen throughout the growing season. These non-woody flowering plants provide wildlife food and seed, attract insects to maintain ground and grassland birds and provide perches for songbirds.[7]	Dickcissel, red-winged blackbird, scissor-tailed flycatcher, kinglets, warblers, and other insectivores.	**Region specific** Western ragweed, lambsquarters, black-eyed susan, blazing star, coreopsis, wild bergamot, flowering primrose, chicory and coneflower are examples of different regional native flowering forbs.
Woody shrubs Help create an important "transitional zone" along with food and cover for migratory and nesting birds. Food-bearing shrubs are critical to a large number of birds, especially during migration and provide protection from inclement weather.[8]	Robins, bluebirds, thrushes, catbirds, cardinals, waxwings, pine grosbeaks, finches, many others chickadees, starlings, hermit thrushes, American robins, cedar waxwings and northern mockingbirds.	**Region specific** Buckthorn, hawthorn, red flowering currant, elderberry, black gooseberry, toyon, coffeeberry and tobacco brush are examples of of different regional native woody shrubs.
Taller trees Provide shade and reduce evapotranspiration, as well as create attractive nesting areas and perches for predatory raptors, a helpful addition to an integrated pest management strategy to control crop damaging rodents.[9]	Sharp-shinned hawks, cooper's hawks, American kestrel, red-tailed hawks and barn owls.	**Region specific** Native mast-producing trees such as hickory, chestnut, crabapple, walnut, sugar maple, beech, oak and dogwood provide habitat, food and protection.

Site Preparation and Planning[10]



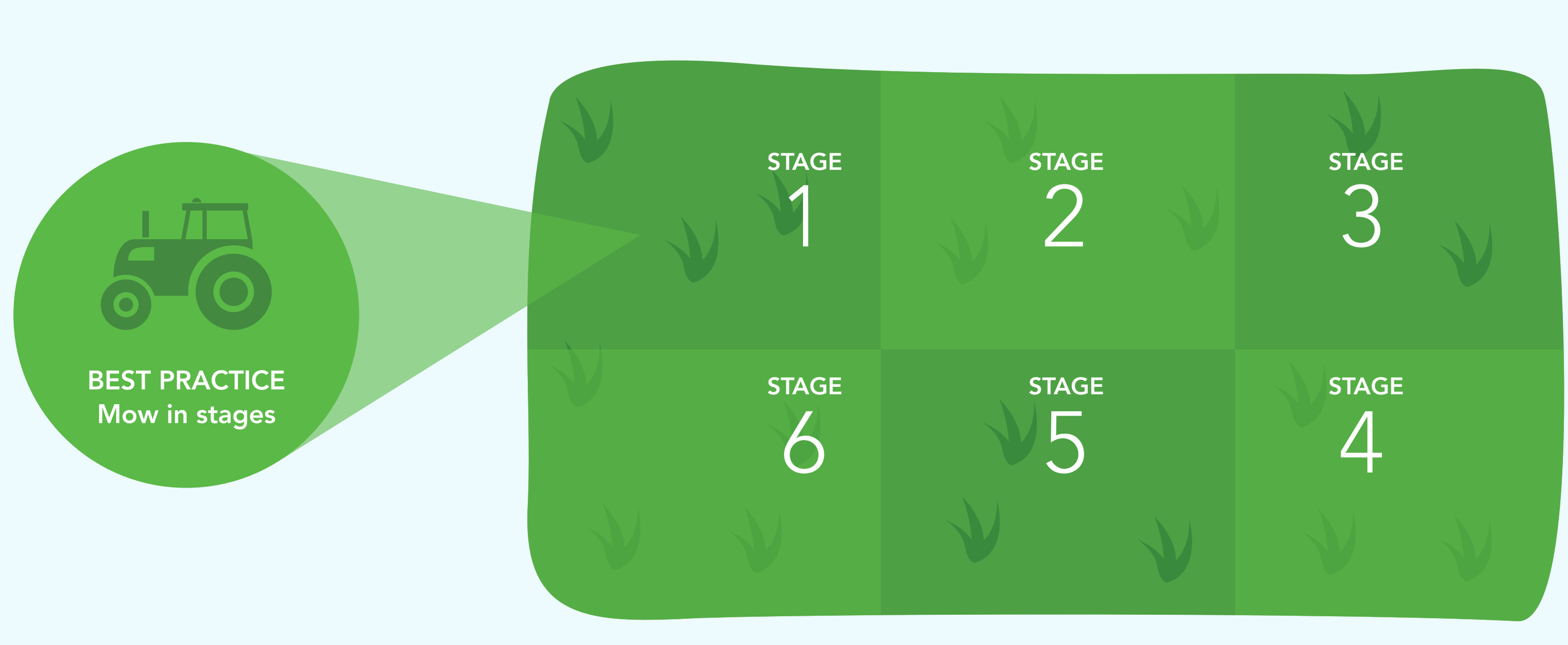
A buffer zone hedgerow should be prepared for planting by a combination of disking and seedbed shaping for perennial grass and forb seed mix. The best bet to manage weeds later on is to avoid using a no-till drill on unworked ground; and whether using flat or raised beds (Long and Anderson recommend 60-inches), it is important to use plants that only tolerate flooding if the hedgerow will be flood-irrigated.

Space large shrubs at 15-foot intervals and place smaller ones in between at 7.5-foot intervals. Trees need a 20- to 30-foot spacing, depending on the variety.

Plant native perennial grasses at 12 to 14 pounds per acre and the "forb strip" at 15 to 20 pounds per acre. It is best to use a no-till drill for the native grasses because the long awns on some varieties tend to get stuck in the drills. Alternatively, perennial grass seed can also be broadcast at 20 to 25 pounds per acre, and forms at 20 to 30 pounds per acre, then lightly harrowed by dragging a chain across the site to cover the seed.

The best time to plan is either in fall or early spring depending on your region, but when cooler and wetter conditions are in full effect to allow plants to establish well before summer heat sets in. Irrigation every 1 to 2 weeks for the first few years will help the plants become well rooted. Bird scare tape on poles can help with bird herbivory on new for seedlings until well established.

Bird Friendly Maintenance/Mowing Practices for Hedgerow Edges[11]



Farmers must assess to determine which mowing practices they want to use while maintaining economic profitability. It's important to note that if the hedgerow perennial grasses are to be harvested, cut or maintained, nesting birds do not react in time to avoid high-speed harvesters and will not flush at night. The following tips will help keep bird populations out of harms way when possible:

- Lower the mower speed, especially where birds have been observed.
- Avoid nighttime mowing.

Delay mowing

Depending on your region, it is helpful to know what birds are most likely to nest in the perennial grasses and/or forage in the outer edge of your hedgerow. Checking in with your local Audubon Society to find out species nesting dates and patterns and either preempt or delay maintenance by several weeks to avoid the nesting cycle.

Use rotational mowing

Using a hayfield management approach of rotational mowing will allow hedgerow areas to be in various stages of growth and vegetative diversity throughout the year. It is helpful to identify areas not critical for early mowing or those that are usually too wet for early mowing. Simple avoidance of areas where birds are frequently seen or leaving small patches unmowed can protect many nesting birds and provide suitable cover and feeding areas for the rest of the summer.

Flush and daytime mow

A flushing bar is a simple tool that drags chains ahead of hay mowers to scare wildlife out of harms way. It is important to note that birds that are flushed will not be able to nest successfully in these areas but may be able to re-nest elsewhere, depending on the time of year. Attaching flushing bars to front end loaders using quick attach plates or fork pockets makes for an easy assembly process. One can design their own flushing bar or be specific to equipment by reviewing the www.theflushingbarproject.net and resources from the Minnesota NRCS.

Resources and References:

1 Garfinkel, Megan, and Matthew Johnson. "Pest-removal Services Provided by Birds on Small Organic Farms in Northern California." Agriculture, Ecosystems & Environment 211 (2015): 24-31.
2 Hyde, Daria, and Suzan Campbell. Agricultural Practices That Conserve Grassland Birds. No. E3190. Michigan State University Extension, 2012.
3 Earnshaw, Sam. Hedgerows for California Agriculture. Community Alliance with Family Farmers, 2004.
4 Long, Rachael. "Hedgerows Enhance Bird Abundance and Diversity on Farms." UC Division of Agriculture and Natural Resources. October 31, 2012. http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=8614.
5 "Hedgerows Turn Farm Edges into Bird Habitat." Audubon California. 2015. http://ca.audubon.org/conservation/hedgerows-turn-farm-edges-bird-habitat.
6 Garfinkel, Megan, and Matthew Johnson. "Pest-removal Services Provided by Birds on Small Organic Farms in Northern California." Agriculture, Ecosystems & Environment 211 (2015): 24-31.
7 "Hedgerows Turn Farm Edges into Bird Habitat." Audubon California. 2015. http://ca.audubon.org/conservation/hedgerows-turn-farm-edges-bird-habitat.
8 Landscaping for Wildlife: Scrub-shrub Habitat and Hedgerows. Conserve Wildlife Foundation of New Jersey, 2012.
9 Olson, Shilah, Karen Lamson, Mike Omeg, Brian Tuck, Susan Kerr, and Ellen Hammond. Attracting Birds of Prey for Rodent Control. EC1641. Oregon State University Extension Service, 2012.
10 Long, Rachael, John Anderson. "Establishing Hedgerows on Farms in California." ANR Publication 8390 (2010): 1-7.
11 Hyde, Daria, and Suzan Campbell. Agricultural Practices That Conserve Grassland Birds. No. E3190. Michigan State University Extension, 2012.