Wildlife Habitat

Yard by Yard Practices

- Grow native plants
- Host plants for pollinators
- Leave flowering plants in the lawn
- Diverse nectar sources
- Reducing / eliminating lawns
- Eliminate invasive species
- Growing native trees and shrubs
- Bird houses, bat boxes, and bee hotels
- Rock / brush piles
- Wildlife water source

The Importance of Wildlife Habitat

We have lost vast amounts of wildlife habitat throughout the last century, and impacted what remains to varying degrees. While "pristine" habitats like national parks, wilderness areas, and wildlife management areas (even these are not truly "untouched") play a key role in maintaining wildlife populations, we have reached the point where they are not sufficient.

For many wildlife species, the remaining pockets of habitat are too small, too widely separated, and/or too degraded to be sustainable in the long run. The number of birds in the US has dropped by 3,000,000,000 since 1970, a 30% loss. Across all vertebrates, populations have shrunk by an average of 68% during that time span. Invertebrates like insects have fared just as poorly. Even in protected areas, flying insects have declined by up to 75% since 1990 and ground insect populations declined by up to 98%. Threatened mammal species have already collectively lost half of their original habitat. We must find ways for humans and wildlife to live together in the same spaces.

In order to make our properties wildlife-friendly, we should remember three basic things all animals need: food, shelter, and water. Each of these and the associated Yard by Yard practices are discussed in more detail below. If enough people bring back the elements of native ecosystems that are missing from our residential areas, we can play our part in reversing the massive wildlife declines we are witnessing today.

Putting the Practice into Action

Food

Several of the recommended practices in the "Habitat" section are related to providing food for wildlife (using native plants, using host plants, leaving functional lawn species, and planting flowers with diverse bloom times). These practices share an underlying principle: having the right plant community is the foundation of good wildlife habitat.

Native Plants

In addition to the soil health and water conservation benefits of native plants, these are also critically important components of native wildlife habitat. While there is not necessarily anything wrong with having non-native plants in our gardens and landscapes, these plants are much less likely to actively benefit the ecosystem (scientist and author Doug Tallamy compares non-native plants to statues in the garden, adding beauty but little functional value). Our native wildlife is adapted to feed on native plants (or the animals that feed on native plants), hide in them, make nests with them. While widely-adaptable "generalist" wildlife species may be able to use non-native plants, the more highly specialized species rely on close relationships to native plants to survive. Check out our guide to Oklahoma native plants suitable for landscaping here.

Host plants

Host plants for insect larvae (especially butterfly caterpillars) illustrate this principle. The classic example is monarch butterflies relying on milkweed to survive. Monarchs *have* to have milkweed plants for their caterpillars to feed on. Without this native plant, we would lose our monarchs. Many other butterfly, moth, and other insect species have similar specialized relationships with specific types of plants. For this reason, oak trees are one of the best things you can plant. Hundreds of insect species rely on oak trees for food, as well as many birds and mammals. If you have a favorite butterfly species, try looking up its host plant and including it in your garden.

Nectar Plants

While planting host plants is critical to support the young of many desirable insects, adults tend to feed on a different set of plants -- nectar plants! Flowers are a signal to butterflies, bees, beetles, birds, flies, and other pollinators that a plant offers sweet, sugary nectar in exchange for the (unwitting) transfer of its pollen to another plant. But not all flowers offer nectar, and not all plants bloom at the same time (non-native, ornamental garden plants are notorious for having showy flowers that offer no nectar, or for only blooming during short periods of the year). This is another reason why planting a diversity of native* plants is key.

**note that there are also varieties of native plants that have been bred for unnatural characteristics, like fancy blooms or novel colors. These "nativars" have often been changed in a way that prevents them from providing nectar to native pollinators.*

Flowers can be grouped according to when they reach the peak of their blooming, from early spring through late fall. Try to select a variety of native wildflowers so that you have at least three species blooming during each bloom period. This ensures that throughout the entire year your garden will have food available for pollinators. Check out the guides from Okies for Monarchs for some great options.

Finally, remember that your wildlife food sources don't have to be limited to semi-wild pollinator prairies. If you grow fruit trees and shrubs (especially native fruits like mulberries, persimmons, and blackberries) these are excellent food sources for birds and mammals. The Oklahoma Department of Wildlife Conservation (ODWC) has a guide on attracting birds that discusses some recommended tree varieties. Even your lawn can contribute to feeding wildlife if you allow a diversity of flowering species to grow in it. Dandelions, clover, asters, and other lawn "weeds" can actually be highly beneficial to pollinators and other animals. A lawn of purely non-native fescue or bermudagrass can't feed much (aside from maybe the beetle grubs causing brown patches), but a lawn that incorporates diverse species comes much closer to the function of a natural habitat.

Shelter

If we are going to invite wildlife back into our spaces, we must provide adequate shelter from the dangers, noise, and disruption of human-centric landscapes. In addition to the practices above, you can provide shelter for wildlife by reducing/eliminating turfgrass lawns, growing native trees and shrubs to provide vertical structure to the habitat, providing bee hotels/birdhouses/bat boxes, and building rock or brush piles.

Reduce/Eliminate Lawns

The reasons to reduce or eliminate turfgrass lawns have been discussed in depth elsewhere in this guide, so here we will simply note that a short lawn does not provide any of the opportunities to hide from predators or build nests that many small wildlife species need. Pollinator prairies, shrubs, and forested areas are much better for this purpose and make worthwhile replacements for lawns. Check out this fact sheet from the OSU Extension that compares various methods for eliminating bermudagrass before planting more beneficial species.

Exclude/Remove Non-native and invasive species

Invasive species are non-native plants and animals that cause environmental damage, economic loss, or harm to human health. These species are not naturally found in the United States, but were introduced here by humans. The presence of invasive species actively causes destruction to natural systems. If you have invasive plants or animals on your land, removing them may be the most important thing you can do to restore the natural function of native habitat.

Invasive plants are particularly destructive. Many of them cause problems by completely dominating the landscape. They can "out compete" native plants, meaning they take up too much of the space, sunlight, water, and nutrients for native plants to continue to grow. This eliminates the native plants that wildlife relies on for food and shelter and replaces them with a habitat that most animals can no longer use. In Oklahoma, some of the most destructive invasive plants include Johnsongrass, Japanese honeysuckle, Chinese Privet, and Sericea Lespedeza. If you think you have invasive plants growing on your property, check out the resources available from the Oklahoma Invasive Plants Council or contact your local Conservation District or Extension Office.

Plant Native Trees (Vertical Structure)

You can create a rich habitat on your property by incorporating native trees and shrubs to create the vertical structure many animals need in their habitat. Try to plant a mix of tall and medium trees, small shrubs, wildflowers, and open spaces with shorter vegetation. Many animals, especially birds, rely on the different layers of the forest canopy for different purposes and having a range of vegetation height in your yard can increase the number of bird species you support. Oak trees are some of the most important and beneficial tree species we have. Oklahoma has many native species, with a range of growth forms suitable for whatever landscaping situation you have. Check with the Forestry Services division of the Oklahoma Dept. of Agriculture, Food, and Forestry for specific tree recommendations for your area and situation, and ask for recommended native species.

Bird Houses

Sometimes it is necessary to supplement natural shelter sources with man-made alternatives. Some birds, especially those that naturally nest in the cavities of dead and broken trees, will utilize birdhouses (also note that if you can leave some of these dead trees and branches you may be providing natural nest sites too). Species like bluebirds, wrens, and several owl and woodpecker species may nest in the houses you provide. Keep in mind that most of these birds are territorial, so only place a few birdhouses in any given area. Also be sure to avoid building birdhouses out of metal or other materials that will heat up in the sun. You can find information about building nests for specific birds in the ODWC's excellent guide here.

Bat Boxes

Like birds, many bat species can benefit from artificial nests to mitigate some of the impact of losing natural tree cavities and other nesting sites. But bats can be a little more specific than birds in terms of house design and location. Before putting up a bat box, consider whether it is the best thing you can do to support bats in your area. Retaining natural nesting sites in dead trees is preferable to putting up artificial nests. Bats also need a safe, reliable, permanent water source (like a lake or river) within a quarter mile of the nesting site. And if bats would have to cross a dangerous boundary, like a busy road, to get to your nesting site it might be best to avoid putting up a bat box.

If you decide that a bat box is a good option for your location, here are some things to consider:

- Avoid small, dark-colored bat boxes. They get hot enough in Oklahoma's summers to kill bats.
- Location is key! Bat boxes on the southeast side of houses and buildings may be best in Oklahoma to minimize exposure to summer sun. Grouping several boxes close together (such as on the south, northwest, and northeast sides of the same tree trunk) can increase the likelihood they are occupied and give the bats options to change location to maintain their preferred temperature.
- Use untreated wood, with the rough sides on the inside for footholds, to build bat boxes.
- Bat Conservation International has great tips on bat box construction, but keep in mind these concerns about heat and location.

Bee Hotels

What about nesting sites for bees? Once again, the best answer is to provide native vegetation and allow dead branches and bare patches of soil to remain in their natural states. The majority of bees nest in the ground, either digging their own tunnels or using abandoned rodent burrows and other underground cavities. If you can, try to leave some areas of bare soil for bees to use, especially if you can keep it near your native wildflowers. You can also aid ground-nesting bees by using shredded leaves for mulch instead of bulkier woodchips which prevent the bees from reaching the soil.

About 30% of bee species nest in cavities in stems and dead branches. Bee hotels are often promoted as a tool for bee conservation, but they can produce mixed results. They are often improperly designed, can become a source of pests and pathogens, and are as likely to provide nests for destructive invasive bees as for native bees. A much better option is to plant native vegetation with hollow, pithy stems that provide nesting sites as the foliage dies back. Native grasses like Indian grass, switch grass, and little bluestem are excellent options. Raspberries, elderberry, and Joe-Pye weed also have stems that make great bee nests.

If you do decide to build a bee hotel, here are some things to keep in mind:

- Don't use tubes that are open on both ends. Reeds and bamboo shoots, which have sealed nodes between stem segments, are good options because they are open on only one end. Bees avoid tubes if both ends are open.
- Don't use plastic or other man-made materials. Natural materials are needed to wick away excess moisture.
- Smaller bee hotels are better. While large, fancy bee hotels may look great, they are more likely to lead to competition between bees and can attract bee parasites if large numbers of bees are at the same location.
- Change out the nests regularly. In general, it's best to replace nesting materials every other year.
- Remember that bees aren't the only nesting insects that use bee hotels. Wasps are just as likely to nest in the stems you provide. But don't worry! These will be small, solitary, non-aggressive wasps that help control pests and pollinate your garden, not the yellow jackets or paper wasps that build and defend their own nests.
- It's best to build bee hotels for specific types of bees rather than going with a generalized design. Do some research on what cavity nesting bees live in your area and choose your nest materials based on their needs.

Check out this article from the Xerces Society for important bee conservation tips

Rock and Brush Piles

A final shelter option discussed here is the humble rock or brush pile. These provide vital habitat for insects (like bees!), lizards, toads, and other small animals. They can also be great places for birds to feed on insects. While the idea of a "pile" probably sounds messy and unattractive, there are several ways to make these features attractive to both humans and wildlife.

Rock piles are probably the easier of the two to incorporate into aesthetically pleasing landscape designs. A rock pile is a great addition to a water-conscious xeriscaped landscape. Use a combination of large rocks towards the bottom and smaller rocks on the tops and sides. Try to create a variety of cavity sizes and make sure they will not easily collapse. Consider adding a short length of pipe in the bottom of the pile to provide access to a larger cavity in the center of the pile. Rock piles can be great for lizards and other cold-blooded critters that will benefit both from the shelter and the warm surface on which to bask. If you can't build a full rock pile, upturned terra cotta flower pots can also provide shelter for small animals.

While brush piles are generally messier than rock piles, they too can be made more visually appealing. Of course, if you have a location farther from the house and out of view of the neighbors, you can haphazardly pile up brush and garden debris without giving it too much thought. Locating such a pile on the edge of a wooded area can be helpful. If your brush pile will be more visible you can take a more orderly approach to constructing it. Add the largest logs to the bottom of the pile (you can also use three rock piles arranged in a triangle as the base) to create openings and larger spaces on the inside. Stack progressively smaller logs, branches, and brush on the pile until it's several feet high. If this is still too disorderly, consider growing a native vining flower (such as passionflower or coral honeysuckle) to cover up the brush pile while maintaining the inner cavities that wildlife will use.

Another way to make your brush pile more appealing is to build a brush fence. This can be used instead of a brush pile, or as a creative way to hide your brush pile behind an attractive but beneficial border. Trim dead branches until you get long, straight sections the length of your fence "panel" (three to six feet will usually be sufficient). Drive some sort of upright support into the ground, spaced in pairs six to eight inches apart that span the length of your fence "panel." Stack your cut branches between these supports, either individually or in wire-wrapped bundles, until your fence reaches a desired height. This will hide your brush pile from view and provide additional shelter for small animals.

Rock and brush piles are long-lasting and low maintenance, but you should still refresh them every few years. When it's time to start a new pile, try to locate it next to the old pile. Don't completely destroy the old pile, but instead give any wildlife sheltering inside the opportunity to migrate to the new pile.

What about snakes and rodents? It's possible that both of these animals may shelter in your brush and rock piles. While both play an important role in the ecosystem, it's understandable that most people won't want them near their homes. If this is a concern, try to locate your brush piles as far from your home as possible. You are unlikely to experience added problems from these animals as long as you aren't providing additional food sources closer to your home. It is also helpful to learn which snakes in Oklahoma actually pose a danger to humans so that you can coexist with the vast majority of harmless and beneficial snakes that live in our state.

Oklahoma has seven types of venomous snake (copperheads, cottonmouths, and five varieties of rattlesnake). These snakes are all related to one another and share several key visual characteristics that set them apart from all other Oklahoma snakes: they have triangular (or arrowhead) shaped heads, and vertical pupils (like a cat's), and of course the five rattlesnakes all have a distinct rattle. Here's a video that goes into more detail.

While homeowners are much more likely to encounter harmless non-venomous snakes like rat snakes, garter snakes, rough earth snakes, and ringneck snakes, it is always a good idea to avoid picking up any snake you are not 100% sure is non-venomous.

Wildlife Water Source

The final piece of the habitat puzzle is providing a water source for wildlife. There are a wide variety of options to choose from. There are many attractive bird bath options available, or you can make your own from recycled materials. Consider adding some rocks to your bird bath to make it safer for bees, or use a shallower water dish with gravel at the bottom just for watering insects. Bubblers are another great option for attracting birds. These are made with a deep water basin (often filled with rocks), a pump to move water, and an outlet pipe that bubbles water up to run down over the surface of a large rock.

Small ponds can be attractive additions to your landscape. Whether your pond is in-ground or in a container, make sure the sides don't extend too far above the surface of the water to prevent small wildlife from escaping if they fall in. Adding vegetation, driftwood, and rocks can also ensure frogs and other small animals won't drown if they get in your pond.

The biggest concern with providing a water source for wildlife is that you are also providing a potential breeding ground for mosquitoes. Thankfully a few simple design choices and management tips can prevent mosquitoes in your fountains and ponds. Mosquitoes prefer shallow, stagnant water so keeping your water running and making sure your pond has deep, shear sides (at least two feet deep) will make your pond less appealing to mosquitoes. Replace the water in bird baths frequently and be sure there are no other sources of standing water on your property. Providing adequate habitat for predatory aquatic insects (like dragonfly larvae and backswimmers) will encourage these beneficial insects to feed on mosquitoes. You can also stock your pond with mosquito-eating fish. Just make sure to never release non-native fish into the wild! Finally, consider using "mosquito dunks" to kill the developing larvae. These dunks contain a bacterium that infects the digestive systems of aquatic fly larvae (such as mosquitoes) and kills them before they can become adults. They contain no harmful chemicals and won't impact other animals or insects (besides flies).

Ecological Traps

If you're reading this guide, chances are you truly care about making your yard a functional, resilient part of the ecosystem that contributes to conserving wildlife in some way. If that's the case, it's worth taking the time to carefully think through your goals, decide which practices will best achieve those goals, and examine how to make those practices work. If not properly implemented, many of these practices can have unintentional negative side effects. "The road to hell is paved with good intentions," as the saying goes.

One unintended negative consequence that can occur with wildlife-focused practices is the creation of "ecological traps." An ecological trap is a habitat that attracts animals to feed, breed, or live in it but fails to offer what those animals need to survive. An ecological trap unintentionally leads animals to poor or dangerous habitats instead of good and safe habitats.

For example, free ranging cats kill billions of birds in the US each year. If you landscape your yard to attract birds but have a free ranging cat, you may be creating an ecological trap, attracting birds to what they perceive as an ideal habitat but one with a hidden danger. Similarly, if you design your garden to attract pollinators and fill it with native plants, but also spray your land with pesticides and call a mosquito control company to apply mosquito fog to your backyard, you are creating an ecological trap that could kill more pollinators than it saves. If you plant oak trees and other host plants to support butterflies and moths but remove the fallen leaves and prevent the caterpillars from accessing the soil surface, there will be no way for the larvae you attracted to complete their lifecycle and become adults.

This should not discourage anyone from doing what they can to make small, positive impacts with the land they steward. But it should encourage all of us to think carefully about our choices and critically evaluate the traditional or trendy suggestions for backyard conservation. When in doubt, try to contact an expert in the type of wildlife you wish to benefit. Many of them are excited for the opportunity to share their knowledge with someone who wants to make a positive impact and will be happy to give you some perspective on your practice choices that you may not have otherwise.