BRINGING BIRDS HOME

A Guide to Enhancing Arizona Deserts for Birds and Other Wildlife

Tucson Bird Alliance

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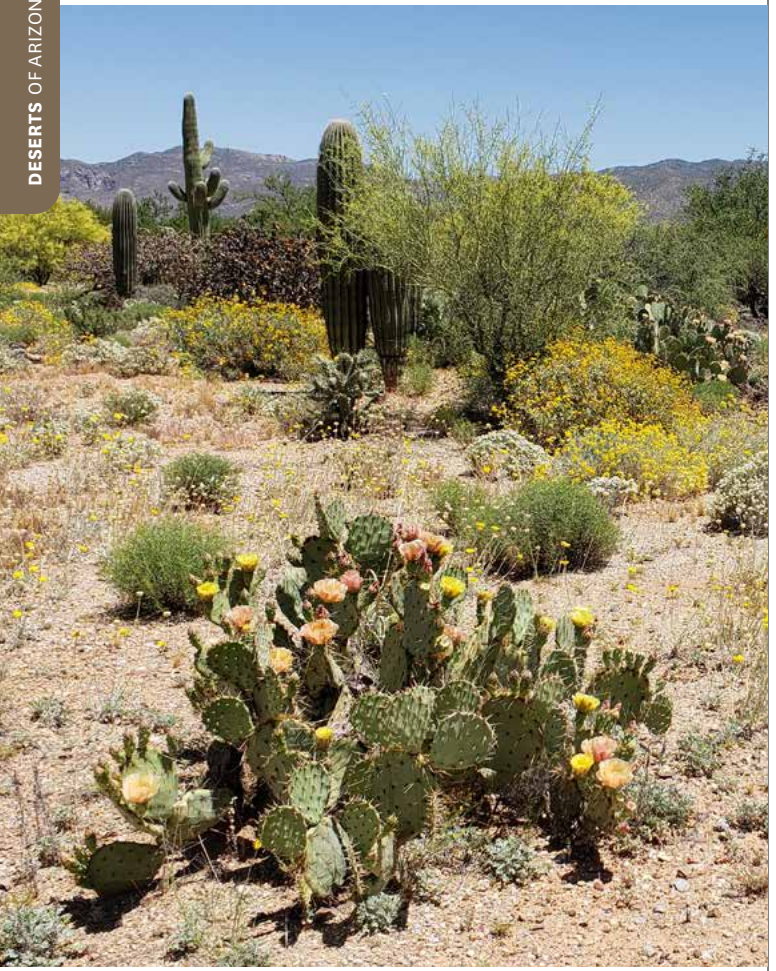
Arizona contains amazingly diverse land types, from mountain forests and canyons to grasslands and deserts. These habitats provide homes for many kinds of plants and animals and help make Arizona a world famous destination. The most recognizable Arizona landscape is the Sonoran Desert with its iconic saguaro cacti. Arizona's largest urban centers of Phoenix and Tucson are in the Sonoran Desert, and this guide will help landowners and residents conserve, enhance, and restore desert habitat to benefit birds. In doing so, you will also create habitat for Arizona's unique mammals, reptiles, amphibians, and insects.

DESERTS OF ARIZONA

Arizona is lucky enough to have all four North American deserts. Each is beautiful and distinctive in their own way.



Sonoran Desert, J. MacFarland

Sonoran Desert *Elevation 200–4,000 feet*

A hot subtropical desert defined by Saguaro cactus and a high diversity of plants and animals. From elevations of 200 feet and less than one inch of rain annually near Yuma to over 4,000 feet in the mountains surrounding Tucson and Phoenix and up to 14 inches of rain arriving in low intensity winter storms (December/February) and violent summer (July/August) “monsoon” thunderstorms. This is the primary Arizona desert and covers the southwest quarter of the state.

Low Sonoran Desert is dominated by creosote bush and white bursage. In more saline locations saltbush is dominant. The washes in the lower Sonoran Desert are oasis where velvet mesquite, palo verde and ironwood trees provide shade. These areas known as microphyll woodlands are an extremely important feature of the desert. Bird species are more diverse and abundant in association with the desert washes and other wildlife depends upon them for shade. Soils are often tightly packed pebbles with a desert varnish; this “desert pavement” is easily destroyed by vehicle tracks. When disturbed, non-native plants readily invade. Non-native vegetation such as Russian thistle (also called tumbleweed), grasses, and annual mustards invade when agriculture fields are retired and abandoned. Following a wet winter, the desert floor will bloom in a colorful surge of wildflowers in February and March.

Upper Sonoran Desert is dominated by saguaro and other cacti such as cholla, prickly pear, and barrel cactus. Ocotillo along with woody shrubs and trees including acacias, mesquite, paloverde, and ironwood are very common. Mountain canyons carry large volumes of water in rain events and spread into washes that crisscross the alluvial floodplain at the base of the mountains. Flash floods are common in the monsoon season. These washes can be some of the most vegetated areas and are a refuge for birds and wildlife in the hottest months and provide corridors for wildlife.

Mojave Desert, J. MacFarland

Mojave Desert *Elevation 400–5,000 feet*

Joshua Trees are distinctive to this hot and dry desert that typically has very few trees. The Mojave Desert, is located in western Arizona and shared with California and Nevada. It includes the urban areas of Kingman and Lake Havasu City. The driest desert in North America, minimal rainfall (2–4 inches annually) is primarily during winter months. The lowest elevations are similar to the Sonoran Desert with creosotebush-bursage and saltbush dominant plant communities. Joshua tree appears on the higher slopes mixed with banana yucca, Cooper's goldbush, burroweed, big galleta grass, and cholla cacti. After a wet winter the desert floor can be a spectacular show of wildflower blooms.

Chihuahuan Desert, J. MacFarland

Chihuahuan Desert *Elevation 3,500–5,000 feet*

Hot in summer and cold in winter, this warm-temperate desert quickly mixes with desert grasslands above 4,000 feet elevation in southeastern Arizona. It is classified as both a high desert and a shrub desert due to the diversity of low shrubs this ecosystem supports. At the lowest elevations creosote bush is the dominant plant, mixed with tarbush, sandpaper bush, shrubby mesquites, ocotillo, and whitethorn acacia. The mountain foothills are dotted with shindagger agave, beargrass, and Yuccas. Native bunchgrasses often grow under the shrub overstory. Rainfall from 6–16 inches is primarily in summer and hard freezes are common during the winter. Safford and Douglas are located at the northwestern and southeastern extent of the Chihuahuan Desert in Arizona. Every spring the Chihuahuan Desert is known to put on a stunning display of wildflower blossoms.

Great Basin Desert, J. MacFarland

Great Basin and Colorado Plateau Deserts

Elevation 4,500–6,500 feet

The deserts of Northern Arizona are the coldest and highest elevation deserts in the state. The Great Basin desert is found on the Arizona Strip north of the Grand Canyon and the vegetation is mainly sagebrush mixed with other small shrubs scattered over bare ground. Described as sagebrush steppe, it is a unique habitat for a variety of birds. The desert of the Colorado Plateau has floristic elements of the Great Basin and includes the Painted Desert. Dominant shrubs include shadscale, greasewood, Mormon tea, and blackbrush. The communities of Holbrook and Winslow, the Navajo Nation, Monument Valley, the Hopi mesas, San Juan Southern Paiute, and Kaibab Paiute are within this desert that is dominated by expanses of exposed rock and geological formations. Rainfall from 7–10 inches in summer thunderstorm events and an average of 10 inches of snow in the winter characterizes these cold deserts.

Your Desert Habitat—Why Is it important?

At first glance deserts may seem to be “empty” lands. A closer look reveals the amazing plants and animals that call these areas home. Desert plants have adapted to the extremes of temperature and aridity by using both physical and behavioral mechanisms, much like desert animals. Cacti such as saguaro can expand and store water during rainy times and then use the water in the driest months. Mesquite and palo verde trees have adapted to arid environments by growing extremely long roots, allowing them to reach moisture deep in the ground. Desert perennials (plants that live more than two years) remain dormant during dry periods and then spring to life when water becomes available. Most annual desert plants, such as wild flowers, germinate only after heavy seasonal rain, then complete their reproductive cycle very quickly.

The secretive nature of desert animals further adds to the mystique. Many animals avoid the hottest part of the day or only venture out at night. Deserts can survive long periods of drought, but they are also sensitive to disturbance and can be slow to regenerate, if at all.

Many private properties have natural desert areas. Most of our Bureau of Land Management and Arizona State Trust lands are in the deserts of Arizona. The Coronado and Tonto National Forests and most of our National Parks and Monuments have expansive desert landscapes. Apart from being stunningly beautiful and providing important habitat for plants, animals, and people, deserts are also areas for recreation and cultural connection. Let’s get started as to how your actions will help protect and enhance Arizona’s deserts!

Gates Pass, J. MacFarland

DESERT LAND ASSESSMENT

Desert areas are very precious and their status can be important to the overall health and stability of your land. Well-managed deserts minimize threats like dust storms and erosion while providing food and shelter for key wildlife species. The first step is to assess your current conditions. How do you begin? Take a walk through your property. Take special note of the variety of plant species, status of the soil and presence of washes or small drainages. Keep in mind that deserts can look different throughout the year.

Look for Signs of a Healthy Desert Ecosystem

Habitat Score Sheet Part 1

- If there is a wash or drainage present, is it lined with trees/bushes? ☐ Yes ☐ No
- Do you see native perennial bunchgrasses? ☐ Yes ☐ No
- Do you see a variety of cacti and/or shrubs? ☐ Yes ☐ No
- In the spring/summer is there a variety of wildflowers present? ☐ Yes ☐ No
- Are there vines climbing bushes and trees during the wet summer months? ☐ Yes ☐ No
- In the Sonoran Desert, is mistletoe in the palo verde and mesquite trees? ☐ Yes ☐ No
- Do you see any cryptobiotic soil patches? (more info page 20) ☐ Yes ☐ No
- Are there trees with spreading branches that provide shade? ☐ Yes ☐ No
- Are there holes in the ground made by small mammals? ☐ Yes ☐ No

For every 'Yes' add one point—enter total here: _____

Look for Potential Issues *Habitat Score Sheet Part 2*

- Has there been soil erosion caused by trampling of livestock, horses, or wild burros? ☐ Yes ☐ No
- Has there been soil erosion caused by vehicle use? ☐ Yes ☐ No
- Are there large patches of bare earth with no cryptobiotic soil present? (info page 20) ☐ Yes ☐ No
- If there is a desert wash present, are the banks a steep vertical drop-off instead of smooth, shallow edges? ☐ Yes ☐ No
- Are there invasive plants present such as tumbleweed, buffelgrass, stinknet, and non-native mustards? ☐ Yes ☐ No
- Do trees look stressed with yellow leaves and/or bare branches? ☐ Yes ☐ No
- Is there a lack of perennial grasses, flowering plants and/or bushes? ☐ Yes ☐ No

For every 'No' add one point—enter total here: _____

Combine the two scores—overall total: _____

What Did You Find?

Overall score 12–16:
It looks pretty good!
This booklet contains many ideas for keeping your desert habitat healthy or even improving it further for your enjoyment and the benefit of wildlife.

Healthy desert habitat, J. MacFarland

Overall score 9–11:
There are some opportunities to improve
Your desert is mostly healthy overall. With a little work and updated practices your desert can be even better for you and for wildlife. There are many ideas in this booklet to help you accomplish the goal of a healthier desert.

J. MacFarland

Overall score 8 or lower:
Your desert needs some work
Making some changes can really improve the overall health of your desert and keep more moisture on your property while preventing more damage over time. This booklet has many ideas on simple practices and activities to help improve your desert and make it more productive for wildlife and pollinators such as butterflies and native bees. If your score was significantly lower than 8, there are suggestions in the back of this booklet for additional resources with more comprehensive information.

Damaged desert habitat, J. MacFarland

Types of Desert and Desert Features

Desert is a broad category that can encompass many different types of habitat that often meet and overlap. The main feature these areas share is a minimal amount of moisture and the strategies of plants and animals for adapting to this challenge. Providing water for birds and wildlife can be a very important addition.

Many aridlands plants are long lived but require time to establish root systems after being planted to survive drought. Furthermore, their slow growth means they need a long time to recover from damage like broken limbs and changes in water flow and grade, which makes it important to plan work on your property carefully to avoid unplanned damage.

Desert areas face many threats. Large patches are cleared and converted to agricultural lands and urban areas every year. Off highway motorized travel, solar energy projects, and associated infrastructure (roads and powerlines) are challenges requiring thoughtful planning and selection of sites and routing.

Arizona's largest cities are within the Sonoran Desert and vast areas of natural desert are cleared as these urban and suburban areas expand. We can take steps to help lessen those losses of habitat for desert animals by protecting and stewarding healthy and productive deserts. In the pages that follow, learn what you can do to support desert habitat.

Native desert, J. MacFarland

Desert Washes

In the Sonoran Desert, washes (water runoff pathways) are typically lined with trees such as mesquite, palo verde, ironwood, and catclaw acacia. Trees and shrubs in a desert wash grow larger than the same species away from a wash. Beneath these trees grows a community of shrubs and grasses with vines and wildflowers present during the rainy seasons.

Incutting

Creek restoration

Rocks to heal erosion

RECOMMENDED PRACTICES FOR DESERT WASHES:

- Keep your desert wash as wide and shallow as possible.
- Refrain from any excavation along the sides or the bottom of the wash, and focus on slowing, not stopping, water flow. Avoid engineered solutions such as concrete lining.
- Use stones, check dams, and gabions (a wire basket filled with rocks) to prevent bank erosion. If waterways are cutting into the ground, place rows of rocks perpendicular to water flow. These are easily made with native materials (rocks and larger sticks). "Weave" the materials together in a broad "V" shape, with an overflow point in the middle. Gabions slow and trap water and soil during rain and floods. Seeds can then settle into these spots with deeper and more moist soil, and before long you'll have a wash with thriving vegetation. Start small and observe the results of your work.
- Let understory vegetation grow freely. Desert washes need to deal with brief periods of very heavy water flow during sudden summer rains. Preserving or planting native trees along waterways is an excellent way to keep washes healthy and resilient.

RECOMMENDED **PRACTICES**

Healthy desert wash, J. MacFarland

Desert Soil Health

Desert soils are fragile. You can protect and possibly restore your soils with time and effort.

RECOMMENDED PRACTICES FOR DESERT SOILS:
Leaving desert soils as undisturbed as possible is one the best ways to protect the desert.

- Reduce the number of pathways across your property. Limit road/trail impaction as much as possible and lay branches on the ground to "close" less used paths and roads.
- To assist natural recovery on decommissioned backcountry roads, use techniques such as recontouring road berms to reestablish draining patterns, vertical mulching ("planting" dead plant material), and creating barriers to prevent continued use.
- Brush piles—provide cover for wildlife and improve soil health.
- Protect desert crust and cryptobiotic soil—this IS the topsoil. If it must be disturbed try to save the crust layer and put it back when you work is complete.
- Protect desert pavements—desert soils are sometimes capped with tightly packed pebbles and stones that protect against erosion and soil loss. These naturally created "desert pavements" take decades and centuries to form.

Desert pavement, J. MacFarland

- **Reduce traffic**: Create a few "pathways" and routes through your property to reduce the amount of soil disturbance and compaction. You can begin to reclaim unused routes and roads by laying down brush and branches to discourage their use. Plant cacti at entry points, and create small, one-rock dams perpendicular to the road, to slow water flow and promote plant growth. Over time, the soil will regenerate, though this can take a long time in the desert.

Blocking desert trail, J. MacFarland

- **Don't rake**: Leave leaf litter where you can as natural compost. Piles of brush and branches are also great for the soil underneath and provide cover for birds, lizards and other wildlife.
- **Bare soil is beneficial too**: Patches of exposed soil are important nesting spots for lizards and solitary bees.

Amazing and Unique Desert Soil Feature:

Did you know soil crust in the desert can be alive? Also called biological, or cryptobiotic soils, these black or gray patches topping the ground in the desert are formed by living organisms in the soil. They create a crust of soil particles, bound together by organic materials. Crusts are mainly made up of green and brown algae, mosses, cyanobacteria, and lichens. If you have biological crusts on your property, you are so lucky, and should do everything you can to protect them! They prevent soil erosion, increase infiltration of water, and provide nutrients to desert plants.

How to help: Don't trample them! They are very fragile in the dry months so avoid walking or driving over biological soil crusts. They take a long time to form, so the best thing we can do to help is protect existing biological soil crusts. If you must disturb them you can try to move the top layer with a flat shovel to a different area or return to original location when disturbance is completed. Do not provide additional water as it can encourage weeds.

Biological soil crust, J. MacFarland

Native Plants

Thorns are natural in the desert.

Conserving existing native plants and adding more to your property is one of the best ways to help wildlife that has been displaced by urbanization. Plants that naturally occur in our desert areas thrive in this climate and **use less water than non-native species**.

FEATURED DESERT PLANTS:

Saguaro, J. MacFarland

Saguaro (*Carnegiea gigantea*) (Sonoran): Iconic cactus of the Sonoran Desert that is equipped to store water to survive long periods of drought. Springtime white blooms (Arizona's state flower) are full of nectar and pollen on which many birds, insects and bats feed. Deep red fruits in the summer are an important food source for many animals and significant to indigenous people.

Palo Verde, Andy Blackledge

Palo Verde (*Parkinsonia* spp) (Sonoran): Blue palo verde (*Parkinsonia florida*) grows quickly, prefers washes, and produces a bean favored by wildlife. It is shorter lived that the Foothills palo verde (*Parkinsonia microphylla*). Foothills palo verde live longer and are also excellent wildlife plants. Mistletoe often establishes in these trees. Keeping the mistletoe under control rather than eliminating it provides food and shelter for birds like Phainopeplas. Avoid Mexican palo verde as it is invasive.

Mesquite (*Neltuma* spp.) (Sonoran, Mohave, Chihuahuan): Both velvet and western honey mesquite are native and vastly better to plant than non-native South American varieties. Native mesquites provide flowers and seed pods as critical food sources for many birds and animals. When possible, allow mesquites and other trees to grow "wild" with branches reaching the ground. These are vital hiding areas for many birds.

Mesquite, J. MacFarland

Non-native mesquites trees are more likely to topple during storms and damage sidewalks and pavement. Planting a native mesquite is one of the best ways to help birds in the Sonoran Desert (see page 45).

Creosote Bush (*Larrea tridentata*) (Sonoran, Mohave, Chihuahuan): One of the most successful of all desert plant species. Instead of thorns, it uses smell and unpleasant taste for protection. It has tiny leaves that close their stomata (pores) during the day to avoid water loss and open them at night to absorb moisture. The fragrance of this bush is the source of the distinctive and beloved "desert rain" smell. Many small butterfly and moth species need this plant to survive, and it provides cover for many wildlife species.

Cresosote, J. MacFarland

Ocotillo (*Fouquieria splendens*) (Sonoran, Mohave, Chihuahuan): Most of the time this woody plant looks like a bundle of thorny sticks. Small green leaves will quickly appear in response to rainfall and its large clusters of red flowers are a vital food source for hummingbirds and other birds such as verdins and orioles.

Ocotillo, J. MacFarland

Cholla, J. MacFarland

Cholla (*Cylindropuntia* spp.) (Sonoran, Mohave, Chihuahuan): These very spiky, segmented cacti do well in the driest conditions. Their formidable thorns create safe places for Cactus Wrens and Curve-billed Thrashers to nest. Avoid clearing these plants whenever possible and plant them away from pathways.

Prickly Pear, J. MacFarland

Prickly Pear (*Opuntia* spp.) (All): This cactus has paddle-shaped pads which provide nesting cover for Gambel's Quail. Their blooms have a variety of beautiful colors and their summer fruits are deep red and juicy, an important food source for many birds and animals. They are safe for humans to eat as well, and make delicious jellies and syrups, but watch for their tiny spines!

Wolfberry, Matt Griffiths

Wolfberry (*Lycium* spp.) (All): This berry producing shrub provides excellent cover and food for a wide variety of birds and other wildlife. It's a great 'bridge plant', providing flowers during the winter months that are relied upon by wintering hummingbirds and butterflies.

Brittlebush, J. MacFarland

Brittlebush (*Encelia farinosa*) (Sonoran, Mohave): An easy-to-establish plant that requires minimal moisture. Produces colorful yellow flowers in the springtime. A good choice to stabilize soils and reduce erosion.

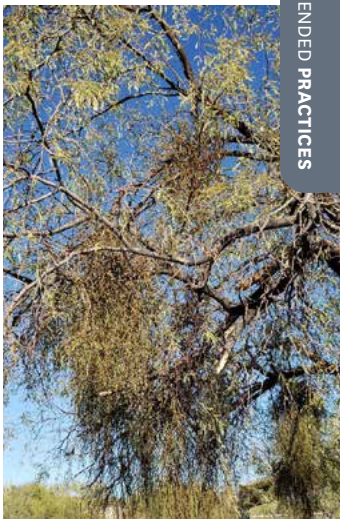
Saltbush, Sue Carnahan

Saltbush (*Atriplex* spp.) (All): Fourwing and shadscale do well in very arid and harsh desert environments. They produce small seeds favored by birds, and provide shelter. Also a good choice to stabilize soils and reduce erosion.

RECOMMENDED PRACTICES FOR NATIVE PLANTS:

- Look for and **eliminate invasive plants** such as bufflegrass and stinknet to reduce fire dangers.
- **Plant native species** and spread seeds of native grasses and annuals such as wildflowers. No invasives!!
- **Pollinator patches**: Clusters of native, nectar-rich plants help sustain hummingbirds and other pollinators such as butterflies, moths and bees. Milkweeds are vital for caterpillars of Monarch butterflies and also provide nectar.
- **Native Grasses**: Many species of butterfly need native grasses for their caterpillars, and the seeds feed many species of birds.
- **Native Shrubs**: Saltbush, brittlebush, fairy duster, wolfberry, graythorn, and desert hackberry create dense cover that protects birds. These shrubs also provide fruits, flowers, and seeds for many birds and other animals.
- **Native Trees**: Velvet mesquite, desert willow, palo verde, ironwood, and net-leaf hackberry provide nesting opportunities and shelter for many birds, and provide food through their flowers, seeds and fruits.
- **Agaves**: These beautiful succulent plants readily multiply with "pups" growing up around the base of the original plant. An agave flowers once in its life, producing a dramatically tall flower stalk, with nectar filled blooms loved by species like hummingbirds and orioles. The adult plant then dies but is replaced by its pups. **Do not cut the flower stalk to prevent blooming**, it will not extend the life of your agave! Both Palmer's and Parry's agave blooms are a vital food source for nectar feeding bats. Native, solitary bees may nest in a dried-out agave stalk if you leave it standing or attached to a fence line.
- **Mistletoe**: Despite what you may have heard, mistletoe is great! It's a native plant that is only partially parasitic and takes very little from the tree where it is growing. Mistletoe provides food and nesting opportunities for Phainopeplas and the berries are an important food source for birds when other fruit is scarce. Look for many species such as bluebirds and waxwings feasting on the berries. Mistletoe can't be bought at nurseries, so if you have it in your trees you are lucky!

Planting agaves, J. MacFarland



Plant stalk bee nest, J. MacFarland; Mistletoe on tree, J. MacFarland

Resources for Desert Birds and Wildlife

WATER FOR BIRDS

Water is a precious resource in the desert and you can provide it for birds and wildlife.

- **Bird bath, fountain or dish**: However you choose to make water available for birds and other animals, make sure it is safe. Place rocks in the basin to prevent baby quail, insects or lizards from drowning. If the water isn't moving, use "mosquito dunks" to prevent mosquitos. They are safe and non-toxic.
- **Escape Ramps**: Swimming pools are great sources of water for birds and bats but are also a drowning hazard. Ensure wildlife can get a drink safely by installing a ramp like metal mesh, wood plank or ready-made ramps. FrogLog wildlife escape ramp will prevent un-necessary drownings of many birds and other animals. Scan this QR code to visit their site:

FrogLog, Julian Donahue

- **Basins around plants**: When planting trees and shrubs, dig a basin for rainfall to accumulate and sink into the ground. This also creates longer lasting puddles after a rainstorm that can be used by birds.

Basin, J. MacFarland

HOME FOR BIRDS

Deserts can be short of good places for birds to hide from predators and access shade to cool down.

- **Plants as cover**: Thick stands of shrubs such as wolfberry, hackberry or graythorn create excellent places for birds to hide from predators.
- **Round Trees**: When possible, let trees such as mesquites grow naturally with their branches growing towards the ground. These are excellent places for birds to nest, hide from predators and find shade during the hottest times of the day.
- **Nestboxes**: You can build or buy nestboxes for birds such as American Kestrel, Western Screech-Owl, Ash-throated and Brown-crested Flycatchers, and Lucy's Warblers. When placed in a shady tree, they don't overheat in the desert, and can be used safely by birds. More info at: tucsonbirds.org/nestbox.
- **Brush piles**: When trimming your trees, create piles of branches for shelter for birds and other animals. Place these piles at least 30 feet away from your house or other buildings, and add to them over time. Many birds will shelter in these piles and quail will even nest in them.

Brush pile, Richard Fray

Threats to Desert Birds and Wildlife

INVASIVE PLANTS

When you see non-native, invasive grass species such as buffelgrass or fountain grass, remove them! They spread very quickly and increase fire danger, while crowding out native grasses which are important food sources for birds and other wildlife.

The worst Invasive plants: There are many non-native plants in Arizona, but these are the invasives that are the biggest threat to Arizona deserts.

Bufflegrass, J. MacFarland

- **Buffelgrass**: Very hardy and drought tolerant. Increases fire hazard in the desert due to biomass accumulation and connectivity of plants, allowing for the rapid spread of fire. Forms large, dense monocultures of grass that can be shoulder height and let little light reach the ground, precluding growth of other species. Outcompetes native plants, resulting in decreased biodiversity. Rarely grazed by native animals.

Stinknet, Tony Figueroa

- **Stinknet**: This highly invasive plant's ball-like, yellow flowers are the reason for the alternate name of "Globe Chamomile". This small plant creates dense monocultures, crowding out native grasses. Oils in the plant can cause rashes, if you are sensitive wear gloves, and use caution when pulling. If you see this plant anywhere—remove it, bag it, and please report it to: stinknet.org

KEEP YOUR CATS INDOORS

Cats are voracious and capable predators that will kill many birds, lizards and other wildlife. Even well-fed cats will hunt and kill birds if they are allowed to roam outside. If your cats enjoy being outside, consider building them a "catio" that keeps them safe from coyotes and other dangers, while also protecting wildlife. More info at: abcbirds.org/catio-solutions-cats.

OPEN PIPES ARE DEATH TRAPS!

Open-top vertical pipes could be on your property for many reasons. They are often used to mark a boundary or hold up a fence or gate. They look innocuous to us but these pipes are literal death traps for many birds and other small wildlife. Cavity-nesting birds often investigate such pipes for a potential nesting or roosting site. Unable to spread their wings or climb the smooth walls, they end up perishing inside. It is very simple and economical to prevent future deaths by covering these pipes. Purchase ready-made caps or fashion a cement plug. Even a tight-fitting rock will do! If it is a ventilation or irrigation pipe then cover it with metal screening. Sometimes the simplest solution is to remove the pipe entirely.

Clockwise from top left: Open death pipe, J. MacFarland; Capped death pipe, J. MacFarland; Kathy and Mike Ellwood capping pipes, Olya Weekley; Greater Roadrunner on open pipe, Brandon Caswell

WINDOW STRIKES

A healthy desert environment will bring in bustling bird life. When foraging and interacting in the habitat, birds are at great risk of window collisions. Every year, up to a billion birds die from colliding with windows in the U.S. alone.

Birds can't recognize glass, mistaking reflections for habitat or transparent panes for clear flight paths. Moreover, artificial lights can confuse migrating birds, leading them off course or into buildings. Up to 50% of all window strikes leave no evidence at all. Even if a bird flies away, quite often they do not survive the injuries and become easy prey for land predators.

J. MacFarland

Best Practices to Prevent Window Collisions:

- Install external blinds and screens to block reflections.
- Keep internal blinds partially closed unless it creates a reflection.
- Place bird feeders and water features within 0–3 feet of windows. If birds take off from this close range, they can't gain enough momentum to injure themselves.
- The best way to prevent window strikes is by making windows visible to birds. Apply decals, paint, or hanging cords on your windows to break up reflections and transparency. Make sure that all designs are visible from 10 feet away. Recommendation for stripes is at least 1/8" wide and for dots at least 1/4" in diameter. It's important to apply these methods on the exterior of the glass and space the patterns at most 2" by 2" to protect even our smallest species. See some suggested methods on Tucson Bird Alliance website.

Window with design, J. MacFarland

Cholla Dwellers

Cactus Wren, Laura Stafford

Cactus Wren

This desert-dwelling wren is Arizona's State Bird. Cactus Wrens are inquisitive with a song that sounds like an engine trying to turn over: "whur-whur whur". In the spring, pairs build covered nests, woven out of grass, within a cholla cactus. The spines of the cholla help protect the parents and chicks from predators. Local studies have shown that this species is very sensitive to urban density and they will suddenly vanish from a suburban area when it becomes too urban.

Scan to hear my call

Cholla Dwellers

Curve-billed Thrasher, Laura Stafford

Curve-billed Thrasher

The cheerful "whit-wheat" call of this brown bird with a large, decurved bill is a common sound of the Sonoran Desert. In the late winter the males will sit up high and sing a complex, warbling song that is lovely to hear. Pairs will build open stick nests in cholla cactus which acts as a natural defense from predators.

What cholla dwellers need: Both Cactus Wrens and Curve-billed Thrashers require cholla cactus to nest. If your yard doesn't have cholla, but a yard nearby has some of these native cactuses, you may still see them in your yard, as several yards together can function as one habitat patch. Both of these birds feed mainly on the ground, probing their long bills into the soil in search of insects. Let leaf litter remain on the ground, plant shrubs for cover, and don't use pesticides.

Scan to hear my call

Mistletoe Dwellers

Phainopepla

Pronounced "fain-o-pep-la", this bird's questioning "wurp?" call is a common sound in desert areas. With the male's handsome glossy black plumage, flashing white wing patches and ragged crest, this bird is often described as a 'black cardinal with a red eye.' The slate gray female is quite beautiful in a more understated way. In winter these birds aggregate in areas of high mistletoe concentration. Phainopepla fiercely defend clumps of native mistletoes in palo verde and mesquite trees against other birds. In the spring these birds nest in Sonoran Desert, often in a tree that is hosting native mistletoe, so a steady food supply is within wing's reach. When temperatures begin to rise in early summer, they gather in nearby riparian woodlands or higher elevation oak and juniper woodlands and raise another brood.

What Phainopeplas need: They eat many native fruits and berries but desert mistletoe berries are far and away their favorite food. Many people worry that mistletoe will damage their trees and have it removed. Concerns about this partially parasitic, native plant are exaggerated. If you are concerned about the health of a tree with lots of mistletoe, large clumps can be trimmed back rather than removed. If you have mistletoe, consider yourself lucky! It cannot be purchased at a nursery. It's the most reliable fruiting plant in winter, which can be a lifesaver for many bird species.

Scan to hear my call

Phainopepla, Lois Manowitz

Gila Woodpecker, Lois Manowitz

Gila Woodpecker

Pronounced “heel-uh”, these woodpeckers are common in wild Sonoran Desert as well as urban areas, but only occur in southern Arizona within the US. Their laughing call is very conspicuous and they have a habit of banging on air conditioning units or other metal surfaces in the spring. They use these drumming sounds like a song, to advertise their claim to an area. Thankfully, they only do this in the spring for a brief time. They will readily use Sonoran Desert urban areas, and carve holes into saguaro cacti or trees to create nesting cavities for themselves. These holes are often used by other species in subsequent years.

Scan to hear my call

Woodpeckers

Gilded Flicker, Laura Stafford

Gilded Flicker

This woodpecker is exclusively found in the Sonoran Desert and is very closely tied to saguaro cactus. Their resonating “kew” call is a communication note between a paired male and female, a real sound of spring. Gilded Flickers will use suburban yards with adjacent intact tracts of Sonoran Desert habitat. They are very sensitive to urban density though, and will vanish from an area once too much natural desert land has been cleared. Flickers mainly eat ants and can be seen feeding directly on the ground. They are so dependant on insects that the use of pesticides should be avoided.

CHARACTERISTIC **SPECIES**

Scan to hear my call

Woodpeckers

Ladder-backed Woodpecker, Lois Manowitz

CHARACTERISTIC **SPECIES**

Ladder-backed Woodpecker

This small woodpecker is mostly black and white with a small amount of red on the top of the male's head. Their sharp "pek" call and distinctive rattle is often how they are first detected. Many of the small nesting holes seen in mesquite or similar desert trees are made by Ladder-backed Woodpeckers, as they are good at digging into very hard woods. They are also responsible for the perfectly round holes sometimes seen in Joshua Trees which also serve as nesting sites for Lucy's Warblers and Elf Owls.

What woodpeckers need: Patches of diverse plants that include trees and saguaros. Woodpeckers primarily feed on insects so they can't tolerate the use of pesticides. Some species of woodpeckers do well in urban areas but others require more natural desert areas.

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Saguaro Hotel

Elf Owl, Richard Fray

CHARACTERISTIC **SPECIES**

Elf Owl

This is the smallest owl in the world, smaller than the average sparrow. Their laughing call can be heard in the darkness in April and May in suburban Phoenix and Tucson. These tiny owls nest in saguaro cactus holes created by woodpeckers. They hunt small prey, primarily insects and other invertebrates such as scorpions. Elf Owls have also been observed nesting in Ladder-backed Woodpecker nesting holes in Joshua Trees in the Mohave Desert.

What Elf Owls need: Large patches of intact Sonoran Desert with large saguaros with nesting cavities are vital for these birds. Elf Owls hunt moths, scorpions and other large insects. They need biologically-rich areas without any insecticide use as well as native trees for roosting when the owls are not in their nest cavities.

Scan to hear my call

Desert Purple Martin, Richard Fray

Desert Purple Martin

A distinct subspecies, in Arizona the Desert Purple Martin nests exclusively in cavities in saguaro cacti during the summer monsoon rains. These long distance migrants winter in Brazil, but travel thousands of miles north every spring to their very limited breeding grounds in large columnar cacti in the Sonoran Desert of Arizona, Sonora, and the Baja California Peninsula. Desert Purple Martins have a lovely, fluid song and hunt flying insects such as dragonflies to feed their young. If you encounter Desert Purple Martins, you can submit your observations through the free eBird and/or iNaturalist apps to support the Desert Purple Martin Project.

What Desert Purple Martins need: Big patches of intact Sonoran Desert and large saguaros with nesting cavities are vital for these birds. Because they almost exclusively eat flying insects, they need biologically-rich areas that are free of insecticides. Desert Purple Martins will even make use of swimming pools, ponds, or other water sources to drink and bathe.

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CHARACTERISTIC **SPECIES**

Saguaro Hotel

White-winged Dove, Dan Weisz

White-winged Dove

These large, migratory doves arrive in early spring and have a distinctive white edge on their folded wing. They will readily spend time in urban yards but are also an iconic pollinator of saguaro flowers, and are common in wild Sonoran Desert areas in the spring.

What White-winged Doves need: These birds are closely associated with the saguaro cactus, but also need other native trees and shrubs to thrive. Saguaros associated with diverse understory and lots of native plants help provide the resources White-winged Doves need to survive.

Scan to hear my call

CHARACTERISTIC **SPECIES**

Hummingbirds

Costa's Hummingbird: Sonoran Desert adapted small hummingbird. Male has a beautiful purple head, female has a smooth gray front with green back.

Anna's Hummingbird: The most common hummingbird in urban areas of Tucson and Phoenix. Male has rosy pink head, female has a dusky gray/green front with small throat spots.

Broad-billed Hummingbird: Often found in drainages and washes as well as lush urban habitat. Male is stunning, with iridescent green and blue over most of body, and a red bill. Female has obvious pale eyebrow stripe and pink at the base of her bill.

Black-chinned Hummingbird: Found both in urban areas and along drainages and washes. Male has a mostly black head, with iridescent band of purple, and obvious white collar. This species is highly migratory and is only present in Arizona in spring and summer.

What hummingbirds need: Hummingbirds thrive in a lush yard with native, nectar-producing flowers and other native plants. There are lots of plant options to put in your Arizona desert yard that are loved by hummingbirds such as chuparosa, fairy duster, penstemons, salvias, and wolfberry. Hummingbirds also eat many tiny insects, and native plants can provide habitat for these insects. If your hard has a compost pile, hummingbirds may hunt for the insects that gather over it. Female hummingbirds build their nests with spider silk, so avoiding the use of pesticides helps ensure hummingbirds have both the materials they need to successfully build a nest, as well as the food required to survive. Hummingbirds will also readily use hummingbird feeders. You can make nectar at home by mixing one part white sugar to four parts water—DO NOT ADD FOOD COLORING! Make sure clean your feeder often and very frequently in hot weather.

Clockwise from top left: Costa's Hummingbird, Dan Weisz; Anna's Hummingbird, Dan Weisz; Broad-billed Hummingbird, Dan Weisz; Black-chinned Hummingbird, Lois Manowitz

CHARACTERISTIC **SPECIES**

Scan to hear our calls

Costa's ***Anna's*** ***Broad-billed*** ***Black-chinned***

Lucy's Warbler

Lucy's Warbler, Richard Fray

This small warbler has a loud and bright song, and is a lovely pearly gray color with a rusty cap and rump. Lucy's Warblers are a characteristic spring bird of low elevation riparian bosques with thick vegetation, as well as upland mesquite thickets, desert grassland, and xeric wash habitat with mesquites. They have also been observed nesting in Ladder-backed Woodpecker nesting holes in Joshua Trees in Mohave Desert.

What Lucy's Warblers need: One of only two cavity-nesting warblers in North America, Lucy's Warblers nests in woodpecker holes or curling mesquite bark. They will also use tiny nestboxes—information on building or buying nestboxes is available on the Tucson Bird Alliance website. Lucy's Warblers need native plants in order to hunt their tiny insect prey. Their favorite plants are native mesquite trees, which support 80 times more native insects than exotic mesquite trees. If you add a mesquite tree to your yard, be sure to ask for a native velvet mesquite or honey mesquite.

This guide shows the difference in leaf structure between native mesquite trees and introduced, exotic species of mesquite from South America. The native mesquites are much better for native birds, and are also less likely to blow over in a storm or push up sections of sidewalk.

Lucy's Warbler nestbox, Paula Redinger

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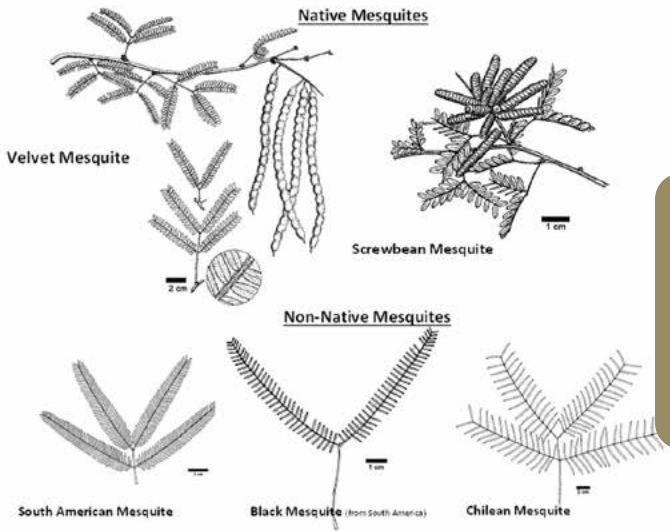

Illustrations courtesy of Matthew Johnson and University of Arizona Herbarium

Tiny Raptors

American Kestrel and Western Screech-owl, Dan Weisz

American Kestrel and Western Screech-Owl

Both of these very small birds of prey will readily hunt large insects and small rodents. They will also occasionally take small birds such as sparrows. American Kestrels are active during the day, while Western Screech-Owls hunt at night, but can sometimes be seen sleeping during the day in the entrance to their nesting or roosting hole.

What Tiny Raptors need: A biodiverse area with no pesticide use is best for providing the large insects, small rodents and birds that the raptors hunt. Both of these species naturally nest in cavities in saguaros, but will readily use a human-made nesting box. You can buy a nestbox or make your own using the plans that are available at: tucsonbirds.org/nestbox.

American Kestrel

Western Screech-owl

Harris's Hawk

Harris's Hawk, Doris Evans

With a complex and fascinating social system, Harris's Hawks really stand out from other raptors or birds of prey. They live in cooperative family units and use teamwork to hunt their prey, similar to wolf packs. They are hierarchical, with the dominant female in the top leadership role. Their lovely chocolate brown plumage, with rusty wing patches and leg feathers, really stands out among other hawks you may see. Their teamwork strategy improves their hunting success and helps them survive in harsh desert conditions.

What Harris's Hawks need: Harris's Hawks need large patches of diverse desert habitat, including animals for them to hunt. They chase rodents, especially rabbits, but also birds and reptiles, so a biologically-rich area with natural vegetation and complex structure is what makes a patch of desert more suitable.

Scan to hear my call

Nestbox-loving Flycatchers

Brown-crested Flycatcher (left), Lois Manowitz
Ash-throated Flycatcher, Dan Weisz

Ash-throated and Brown-crested Flycatchers are closely related birds and look very similar. Ash-throated Flycatcher is the smaller of the two, and returns from its southern wintering grounds earlier in the spring. Both species often nest in woodpecker holes in saguaros but will readily nest in a nestbox that you can install on your property, with Ash-throated nesting earlier than Brown-crested Flycatcher. Sometimes a single box will be used by both species, with Brown-crested moving into a box once a family of Ash-throated Flycatchers wrap up their nesting.

What flycatchers need: These two species may use a nestbox on your property, and all flycatchers value an insect-rich yard with well layered vegetation, and prominent perches for them to watch for prey. Their insect prey need diverse native plants and brush piles. You can find plans to build your own flycatcher nestbox at: tucsonbirds.org/nestbox.

Ash-throated Flycatcher *Brown-crested Flycatcher*

Desert Sparrows

Black-throated Sparrow (left) and
Rufous-winged Sparrow, Dan Weisz

Several species of sparrows spend the winter in desert habitat and then migrate north in the spring to their nesting grounds. However, the **Black-throated Sparrow and Rufous-winged Sparrow** are true desert birds that live in Arizona year-round and raise their young here. Black-throated Sparrows are beautifully patterned birds, with a lovely tinkly song. They are very desert-adapted, and can be found throughout Arizona in desert habitat. Rufous-winged Sparrows have a rufous shoulder patch and cap, along with black "whiskers" extending back from their beak. Their range is much more limited and they are only found in Sonoran Desert habitat in southeast Arizona.

What desert sparrows need: Intact desert habitat with native plants are vital for desert sparrows. Black-throated Sparrows are tied to areas with undisturbed natural soils with a healthy cryptobiotic soil layer.

Black-throated Sparrow *Rufous-winged Sparrow*

Gambel's Quail, Northern Cardinal and Pyrrhuloxia

The mournful call of the Gambel's Quail is an iconic sound of the Sonoran Desert. A handsome quail with a black head plume, they can be found in yards that are near intact desert habitat, or where there are several adjacent yards landscaped with native plants. Northern Cardinal, and the similar looking Pyrrhuloxia (pronounced pyro-locks-ee-ah) are crested songbirds that feed on berries and seeds. They have very similar, sweet songs, and at first glance a Pyrrhuloxia looks like a female cardinal, but notice how the Pyrrhuloxia has a stubby, yellow bill, while the Northern Cardinal has a pointy, red bill.

What dense shrub birds need: To hide from predators, all of these species need thick cover, including wolfberry and hackberry, which also provide berries as food. Brushpiles are also appealing and are easy to make: when trimming trees, simply put the branches in a pile at least 30 feet from your house. Gambel's Quail enjoys bird seed from the ground or a platform feeder. Both Northern Cardinal and Pyrrhuloxia are attracted to tube feeders of safflower or black oil sunflower seed.

Gambel's Quail *Northern Cardinal* *Pyrrhuloxia*

Dense Shrub Birds

Gambel's Quail and Northern Cardinal, Dan Weisz

Pyrrhuloxia, Lois Manowitz

CHARACTERISTIC **SPECIES**

Black-tailed Gnatcatcher

Black-tailed Gnatcatcher, Dan Weisz

A tiny, desert-loving bird with a buzzy, nasal call, the Black-tailed Gnatcatcher jumps quickly around shrubs and small trees while looking for its preferred food of tiny insects. They flash the white edges of their otherwise black tails around as they forage. While males and females look the same during much of the year, in the spring the male develops a black cap.

What Black-tailed Gnatcatchers need: True desert dwellers, these birds need intact desert habitat with abundant native plants, which are habitat for the gnatcatcher's insect diet. To provide homes for gnatcatchers in your yard, aim for patches of native habitat, ideally close to intact desert.

CHARACTERISTIC **SPECIES**

Scan to hear my call

Verdin

Verdin, Doris Evans

This tiny, desert-adapted bird can also be found throughout urban areas. They are mostly gray with mustard yellow on their faces and small rufous patches on their shoulders. Verdins are commonly seen trying to get a sweet drink from hummingbird feeders but mostly feed on tiny insects. They are very industrious and make several spherical nests each year from twigs and grasses. They have a distinctive spring song of a 3-note whistle and give their repeating chip call year round.

What Verdins need: Native plants are very important to Verdins and they spend much of their time hunting for small insects in native shrubs and trees.

CHARACTERISTIC **SPECIES**

Scan to hear my call

Greater Roadrunner

Greater Roadrunner, Doris Evans

Probably the most iconic animal of the Sonoran Desert, Greater Roadrunners live up to their reputation. You never know when you'll spot a roadrunner but it is often along a road in desert habitat. They frequently raise their tail and head crest, and can run surprisingly fast. Lizards and snakes are their main prey during the warmer months, and they will even take rattlesnakes! They don't say "meep," but make a whimpering or cooing song, and a clattering sound with their bill that sounds like rapid castanets.

What Greater Roadrunners need: Large patches of desert habitat with abundant native plants and lizards. They often nest in dense shrubs with thorns, or in shrubby mesquite trees. A neighborhood with multiple yards with abundant native plants could host a roadrunner or two.

Scan to hear my call

Notable Desert Animals

Desert Spiney, Calvin Kunin

Desert Reptiles and Amphibians

It's delightful to watch male lizards do push-ups to impress the females and scare off rivals, and such a treat to spot a perfectly camouflaged horned lizard on the ground, still as a stone. Lizards actually do quite a lot for our deserts. Not only do they consume large amounts of insects and help keep those populations in check, they in turn are food for some of our most iconic animals, such as roadrunners.

These are some of the most common types of lizards you may encounter in your desert yard or garden. Most species are good at climbing and are often seen in trees, on walls and fences, or perched up on rocks.

Regal Horned Lizard, J. MacFarland

Whiptails and horned lizards

These lizards spend most of their time on the ground. Horned lizards are extremely well camouflaged and primarily feed on harvester ants. Whiptails are very active and spend most of their time digging around in leaf litter looking for insects.

Gila Monster, Doris Evans

Gila monster

A large and boldly-patterned lizard that spends much of the year hibernating in underground burrows. Gila Monsters are venomous, but also sluggish; they pose minimal danger if treated with respect. Most commonly seen in the spring and summer in excellent, biodiverse habitat. They mostly feed on eggs, young birds, and mammals.

What Lizards Need:

1. **Rock piles and brush piles**: These help lizards hide from predators and provide temperature buffering, which is vital to all reptiles. Both also provide safe places for lizards to hibernate over winter. A rock pile at the base of a large tree helps protect arboreal lizards dash to safety if they fall from a tree. We don't want to make it too easy on the kestrels and roadrunners!
2. **Native Plants, especially Velvet Mesquite**: Native desert trees that are allowed to grow naturally in a globe shape (vs. trimmed "lollipop" look) create ideal temperature control and lots of hiding places for lizards as well as the insect food they require. Even a trimmed velvet mesquite provides lots of bark crevices for lizards, and planting mid-sized shrubs around the tree, such as wolfberry, also provides protection.
3. **Lizards need to eat too**: Insects are what is on the menu for nearly all lizards. Eliminating pesticides in your yard and planting native species is a great way to support lizard food sources.
4. **Ants**: Harvester ants, which eat grass seeds, are a favorite food source of horned lizards. Native grama grasses are especially important for supporting harvester ant colonies, so planting that and other native species is a good way to help horned lizards. Regal Horned Lizards, with its extensive crown of horns, needs 2–3 ant colonies per acre.

Desert Iguana, Wendy Miller

Desert iguana

These cream colored lizards are an average of 16 inches in length but can get as big as 24 inches. They are found in sandy, creosote-dominant habitats below 3,300 feet in elevation, in both Sonoran and Mohave desert. They are very tolerant of hot temperatures and are often seen out during the hottest part of the day, when other lizards have retreated into underground burrows to cool off. These lizards primarily eat flowers and leaves of creosote bushes, as well as some insects, especially ants.

Sonoran Gophersnake

Kingsnakes and gopher snakes

These beautiful snakes are medium sized, and do not have any venom, making them harmless to people. Kingsnakes are opportunistic hunters, taking rodents, lizards, and even rattlesnakes! Gopher snakes have similar colors and patterns to rattlesnakes, but can be distinguished by their tail that comes to a sharp point without a rattle. Gopher snakes mainly hunt mammals, especially rodents.

Western Diamondback

Rattlesnakes

Watch where you place your feet and hands to avoid run-ins with venomous rattlesnakes. Keep brush piles away from your home and pathways to reduce the likelihood of chance encounters. Cover drainage holes in walls with hardware cloth to help keep snakes out of your yard and keep children and pets safer. If you hear the characteristic buzzing sound of a rattlesnake's rattle, it is warning you to back off. Slowly and deliberately move more than six feet away from the snake. Rattlesnakes mostly hunt rodents, and their amazing ability to sense heat helps them hunt in the dark on warm summer nights. These impressive reptiles always prefer to avoid encounters with humans. The best way to avoid danger with them is to treat them with respect.

Spadefoot toad

Spadefoot, Doris Evans

The first large rain event of the summer monsoon season signals time for spadefoot toads to emerge from their underground burrows. Once above ground, they seek out puddles and flowing washes, where the males give loud, bleating calls to attract females. Their eggs promptly hatch and the tadpoles grow into tiny toads very quickly. At the end of the summer, they dig down into sandy soil to sleep until the next monsoon. They primarily hunt insects, and can be found in both natural and urban areas with washes nearby.

Desert tortoise

Desert Tortoise, Doris Evans

As a reptile that is very adapted to desert living, desert tortoises spend much of their time in burrows and are most commonly encountered in late winter, spring, and during the summer monsoons. They mostly feed on native plants and can travel long distances in search of food. When driving in excellent desert habitat, slow down and watch for tortoises crossing roads. Arizona residents can actually adopt a tortoise that has been displaced or was born in captivity. You need to follow specific guidelines to prepare habitat in your yard, and build them a burrow before you can apply. Learn more about the Tortoise Adoption Program here:

Arizona Game & Fish Department

Arizona-Sonora Desert Museum

Burrowing Animals

Many animals that call the desert home use an underground burrow to escape the extreme temperature fluctuations felt above ground.

American Badger, J. Maughn

American badgers can be found throughout North America, including the deserts of Arizona. They use their strong claws to burrow into the ground to create shelter, as well as to search for roots and tubers to eat. Badger burrows also provide habitat for other burrowing animals that do not excavate their own holes.

Kit Fox, Doris Evans

Kit foxes will sometimes use existing burrows, or can dig their own when needed, to raise their pups in the spring and as shelter year round. Like American badgers, kit foxes are omnivores that subsist on a diet of both plants and animals. Also like badgers, they are primarily nocturnal and are most often seen at night, dawn, and dusk.

Burrowing Owl, Lois Manowitz

Burrowing Owls are the only owl in North America to use underground burrows. In addition to nesting underground, these burrows provide year-round shelter. Burrowing Owls most often use existing burrows or cavities, such as drainage holes, and will frequently expand their burrows by digging. These diminutive diggers hunt small prey such as lizards and rodents and in Arizona they are often found near agricultural areas, especially along irrigation ditches. They are most active at dawn and dusk (known as being “crepuscular”) and can often be seen during the day guarding the entrance to their burrows.

Kangaroo rats are very good at dealing with desert conditions with little to no water availability. Strictly nocturnal, they emerge from their burrows after dark and forage for seeds of native plants and fruits. They get all the moisture they need from these foods, and will gather and store seeds in their burrows. They often dig their burrows at the base of shrubs, such as creosote, and sometimes cluster their burrows together.

Merriam's Kangaroo Rat, Leo Jones

Tarantulas are large, burrowing spiders commonly associated with desert areas. They are most active at night and most commonly encountered during the summer rainy monsoon season when males leave their burrows to search for females. These spiders are not dangerous to humans but do have mild venom and defensive hairs that can irritate your skin. Their shy nature causes them to avoid people, so you can help by giving them space if you are lucky enough to encounter one.

Tarantula, J. MacFarland

What burrowing animals need: These animals use a mixture of plants and animal prey such as rodents, lizards, and large insects. All burrowing animals in Arizona need large patches of ecologically intact desert habitat with abundant native plants. These animals prefer sandy and loamy soil with minimal rocks, as it is easier to dig into and create burrows and tunnels.

Desert Mammals

Javelina, Doris Evans

Javelina

Also known as collared peccary, javelinas look like small boars but are distantly related to pigs. As part of their defense against predators, they often live and travel in small groups. Javelinas eat all sorts of plants, including agave, prickly pear, mesquite beans, and many types of roots and tubers. They are most often found in desert washes, but will come into urban areas in search of food and safe places to rest. If they get habituated to your yard, they can dig up landscaping and cause other damage. Best practice is to avoid attracting them by not feeding them and securing your trash cans and compost bins. Clapping or making other noise encourages them to leave, if you do discover them in your yard. They can become aggressive if they feel cornered or have babies with them, so preventing them from becoming habituated to your yard is advised. It is better for them to be in a natural desert habitat.

Cottontail, Lois Manowitz

Jackrabbit, Doriz Evans

Desert cottontail and jackrabbits

Desert cottontail are the smaller 'bunnies' sometimes seen in desert yards. They have prominent, fluffy, white tails and are most active in the morning and evening. They favor lush desert habitat, with lots of shrubs and places to hide from predators. The black-tailed jackrabbit is larger, with very long ears that have black tips. They can run very fast, often in a zig-zag pattern, and prefer more open desert, where they can flee swiftly from predators. Antelope jackrabbits are even larger, mostly nocturnal, and have large white patches on their bottoms that are very obvious when they run away. All three species eat native vegetation, and are able to eat cacti and other armored plants during times of drought.

Bobcat

These beautiful, native cats are found throughout the Sonoran Desert. They are very capable hunters of medium-sized prey, such as rabbits. They generally weigh 15 to 30 pounds, with males being larger than females. Bobcats are sometimes spotted in urban areas adjacent to high quality desert habitat. In the spring, females and their kittens are sometimes seen in quiet, sheltered yards. Kittens found alone in a yard are most likely not abandoned, but rather waiting in a safe area for the female to return from hunting. Bobcats are potentially dangerous to house cats and small dogs. Keep these pets inside, or supervise them outside to keep them safe.

Bobcat, Dan Weisz

Coyote

These native, wild canids look similar to domestic dogs, but their bushy, black-tipped tail, pointed ears, and long, narrow face help distinguish them. Their yipping cry is a characteristic sound of the night throughout desert areas. They are very adaptable, and often hunt cooperatively in small groups. They venture into urban areas and can be a danger to house cats and small dogs. It is best to keep your cats indoors, and supervise dogs when they are outside to keep them safe from these intelligent and opportunistic omnivores. Coyotes are also very good at catching rodents, and eat fruits and mesquite pods when available.

Coyote, Doris Evans

Lesser long-nosed bat, Dan Weisz

Mexican Long-tongued Bat, Lois Manowitz

Nectar bats

If you find that your hummingbird feeders are suddenly emptied overnight, migrating nectar bats have been in your yard. Two species migrate between southern Arizona and central Mexico: the lesser long-nosed bat and the Mexican long-tongued bat. Female bats tend to be the ones that make the long distance migrations, moving north from Mexico while pregnant in the spring to established "maternity caves" in Arizona, where they will birth and raise their young. They take advantage of blooming cacti in the spring for food. As they head south in the fall with their growing young, they switch to blooming agaves as a food source. Abundant native cacti and mature agaves are vital for nectar bats. Planting agaves and allowing mature plants to complete their bloom cycle is very beneficial to nectar bats.

Both species have discovered and learned how to hover at hummingbird feeders. If they are draining your feeder overnight, please remember that this is a helpful resource for these migrating bats, and feeding them can be just as rewarding as feeding the hummingbirds. You can simply wash and refill your feeder in the morning for the hummingbirds, but if you really want to keep bats off your hummingbird feeder while still providing nectar for early morning hummingbirds, place the feeder on an outside table or other flat surface in the evening. This will deter the bats, leaving the feeder full for hummingbirds in the morning. If you have a fan on your patio please make sure it is turned off at night if you do have bats visiting your hummingbird feeders.

Insect-feeding bats

There are many species of insect hunting bats in the desert, using sophisticated echolocation to catch their prey. They are all nocturnal, sleeping during the day, tucked away safely in sheltered areas. Large groups of Mexican free-tailed bats will shelter together in caves or even under bridges. They can be observed in the late evening during the summer months, leaving the roost to go hunt insects. They are very helpful to have around, as they consume many insects, including mosquitoes. They may use artificial bat boxes, but in desert habitat the boxes need to be very large or attached to a large building to offset the dramatic temperature swings that occur due to the desert's dry air.

Little Brown Bat, Lois Manowitz

Find detailed information on how to support bats with plant choices and bat boxes at Bat Conservation International:

Palo verde root borer is a large, black beetle up to four inches long most often seen during the monsoon season. The adults have a startling appearance but are harmless and only live a short time. Their grubs (larvae) can live several years underground and feed on the roots of native trees such as palo verde. The threat they pose to the health of trees is exaggerated as they prefer to eat dead roots, which may actually benefit trees.

Palo verde root borer, Wikimedia Commons

Insect Pollinators

Butterflies, moths, and native bees need native plants to thrive. It is best to plant nectar-producing plants in same-species clumps, so your flower bed becomes a patchwork of color that helps sustain our native pollinators. With some planning, you can create nearly year-round nectar availability by using varied native plants. This helps pollinator populations thrive.

Monarch Butterfly, Richard Fray

Monarch butterfly

The most famous butterfly in North America, monarchs travel through desert habitat in the late summer and early fall on their migration journey south. Their caterpillars need milkweed plants to develop, but the adults will benefit from any nectar-producing plant. There are several species that look similar to monarch butterflies, so watch for closely-related species like the queen butterfly. Queens are generally smaller than monarchs, and males are especially attracted to blooming blue butterflymist as they need a chemical in this plant's nectar to create the pheromones that attract females. Butterflies and moths in general benefit from abundant and healthy native plants. Many species lay their eggs on plants that don't produce nectar, such as native grasses, and their caterpillars feed on the leaves of these plants.

Native bees

Arizona's deserts are a hotspot of native bee diversity, with over 1,500 species associated with the Sonoran Desert alone. These bees do not live in hives like the introduced European honeybee—they are solitary. Each female prepares a burrow, packed with pollen and other food, for her developing eggs and young. Most of these species dig their burrows in the ground, while some use tunnels in wood. The latter will benefit from "bee blocks" that you can buy or make and place in your yard. Native bees are generally not aggressive and are responsible for pollinating many of the desert's cacti and native wildflowers.

Native Bee, Janine McCabe

Scorpions

While scorpions are venomous, they are generally very beneficial to a desert ecosystem, and as hunters they keep insect populations under control. They're nocturnal and most active on warm nights. You can use a black light to see if you have any in your desert habitat, as scorpions give off a faint green glow under ultraviolet light. The best way to avoid interactions with them is to tightly seal outside doors and windows to prevent them from entering your house. They are also important prey themselves, for larger animals such as Elf Owls and pallid bats.

Scorpion, Doris Evans

CONCLUSION

Arizona's deserts with captivating sunsets and exquisite views are iconic symbols of this great state. Even though there are forests, rivers, mountains, and canyons within Arizona, many think of our deserts as the landscape that sets Arizona apart. Phoenix and Tucson are within the Sonoran Desert. The saguaro cactus bloom is the state flower, and the Cactus Wren is the state bird. No wonder the beauty of the desert is so close to the hearts of those that live in Arizona. With so many Arizonans living in desert areas, we have a fantastic opportunity to turn our yards and properties into homes for birds and other wildlife. If we work together to share our desert living spaces with birds, we can make a positive difference. Our desert cities and suburbs can be places for native birds, and we can enjoy the beauty of their colors and songs in our own yards.

More Resources for Improving Your Desert Yard

Desert Tortoise Adoption Program: If you have an excellent desert yard you can provide a home for a displaced Desert Tortoise. Learn more at:
- azgfd.com/wildlife/nongamemanagement/tortoise/captivecare/
- desertmuseum.org/programs/tap.php

Detailed information about deserts of Arizona
- desertmuseum.org/books/nhsd_northamerica.php

Tucson Bird Alliance's Habitat at Home Program: Lots of information about how to make your yard and property productive for native birds and wildlife.
- tucsonbirds.org/habitat-at-home

National Audubon's Plants for Birds Program
- audubon.org/plantsforbirds

The Arizona Native Plant Society
- aznps.com/native-gardening

EcoRestore
- ecorestore.arizona.edu/recommended

Parsons Field Institute at McDowell Sonoran Conservancy
- mcdowellsonoran.org/science-parsons-field-institute

The **Natural Resources Conservation Service** (NRCS), an agency of the U.S. Department of Agriculture, provides many voluntary programs to assist private landowners with wildlife habitat conservation projects. Information about current NRCS programs can be found at:
- nrcs.usda.gov/programs

Native plant guides for all habitat types in North America
- pollinator.org/guides

Xerces Society: Information about invertebrates such as butterflies and native bees and resources on what to plant for their benefit.
- xerces.org

Sonoran Joint Venture: Arizona Species and Habitat Accounts. These easy-to-use tools help land stewards consider birds when making land use decisions.
- sonoranjv.org/resources/arizona-species-and-habitat-accounts

Tucson Bird Alliance

Audubon SOUTHWEST

Arizona Game & Fish