

# CACTUS HOTEL

Story by Pinau Merlin

EVERY PART OF THIS AMAZING CACTUS, BOTH IN LIFE AND IN DEATH, PLAYS AN IMPORTANT ECOLOGICAL ROLE IN SUSTAINING OTHER SONORAN DESERT CREATURES.



**T**he bushes thrashed wildly about in the wind ahead of the oncoming monsoon rain. I watched as a huge old saguaro swayed, rocking farther and farther under the wind's onslaught.

Finally the giant cactus leaned beyond recovery, uprooting itself and crashing down. The ground shook as it fell, taking out most of a palo verde tree and smashing a prickly pear. The deluge arrived moments later. I stood drenched and transfixed by the drama I had just witnessed — the death of a 200-year-old monarch.

The saguaro is the hero of the Sonoran Desert story. It is among the most famous and most beloved plants in the world, and the indicator plant for the Sonoran Desert. It has a majestic presence few other plants can aspire to (and its own national park). But even more, the saguaro is the center of life and activity for an abundance of creatures and plays an integral role in this intricate desert ecosystem.



HARRIS'S HAWK/GEORGE ANDREJKO

GEORGE ANDREJKO

## SPINY EMBRACE

Saguaros fill the niche of large trees in the Sonoran Desert, providing nesting places for birds and high places to perch and hunt from, as well as food and shelter for a wide diversity of animals. Their massive arms make an ideal perching place for raptors such as red-tailed hawks, Harris's hawks and crested caracaras to build their large, heavy stick nests. Each species constructs its nest differently, and the builder can often be discerned by its style, despite lots of borrowing back and forth.

Red-tails build nests up to 30 inches across and 2 or 3 feet high. They prefer a nest site taller than the surrounding vegetation, with clear access from above and a good view of the area (i.e., a saguaro). They often include all kinds of other items into the nest, like devil's claws or snake skeletons.

One red-tailed hawk nest featured a cactus wren nest tucked into its base. It may seem a foolhardy home site for the wrens, but raptors don't hunt at their nest site. The wrens are safe and get leftovers that the hawk chicks drop. The wrens help the red-tails by providing extra eyes to watch for predators and sound the alarm.

Caracaras, uncommon and quite local in Arizona, invariably use saguaros for their nests. They display great site fidelity, each spring refurbishing and rebuilding on top of last year's nest. Some nests might be layered up to 5 feet high. Caracaras are smaller raptors and live in more open, arid areas of low vegetation, their saguaro being the tallest thing around. Because their habitat contains fewer big plants, they usually gather thinner sticks, vines and twigs, giving the nest a more

delicate look. The parents typically sit on top of the saguaro, leaving a telltale covering of whitewash from the top of the saguaro down to the nest. (In most other raptors' nests, the whitewash is below the nest.)

Great horned owls don't build their own nests, preferring to usurp one from a red-tail or other raptor. The owls often start nesting in January, earlier than the hawks. When a pair of red-tails comes to inspect their old nest in February, they find great horned owls already in residence. In this case, possession is 100 percent of the law.

Saguaros provide great outside homesites with their arms, but their insides are even more in demand. Secondary cavity-nesting birds search the saguaros, depending on woodpeckers to leave an extra cavity. Both Gila woodpeckers and gilded flickers excavate cavities, although they use different parts of the saguaro. Gilas use the middle third of the cactus. These woodpeckers have powerful chisel-shaped beaks, and both male and female excavate the hole, using the space between the outer skin and the ribs inside for their nest chamber.

In response, the saguaro secretes chemicals that cause a scab to form, sealing the wound and the pulpy tissue from the air, thus protecting itself from moisture loss and bacterial infection and forming the nest chamber, or "boot." It takes several months for the scab to dry and harden before the chamber can be used.

Woodpeckers might use a nest cavity for several years, but usually begin excavating new holes in February (and sometimes again after the breeding season) for next year's use. A Gila pair, which mate for life and hold their territory all that time, have favorite saguaros, preferring taller saguaros with arms and,

more often, those along washes. They use these again and again, and sometimes one old giant might have 30 woodpecker holes in it.

Although gilded flickers are larger than Gilas, their beaks are more slender, slightly curved and less powerful since they feed on ants and ground insects rather than pecking into hard wood. Because of their larger size, the flickers need to chop through the ribs and into the saguaro's central cavity to build their bigger nest chamber, but in the middle section of the saguaro, the ribs are strong and thick and often fused.

Flickers therefore move up to the top third of the saguaro, where the ribs are thinner and easier to peck through, to excavate into the central stem tissue. This damage can interfere with water and nutrient transport. Sometimes, a saguaro that has been structurally weakened in this way will lose its top in storms or heavy winds, often leading to bacterial infection and possible death.

These well-insulated cavities are valuable real estate. They're safe from many (but not all) predators and provide a good view of the area. They can be in short supply, and nesting birds that don't excavate their own holes — such as flycatchers, elf owls, western screech-owls, ferruginous pygmy-owls, American kestrels, purple martins and others — compete fiercely for them.

Gila woodpeckers nest in early April, while brown-crested flycatchers migrate and don't arrive in southern Arizona until May when most cavities are already occupied. The brown-crested flycatchers aggressively and persistently attack woodpeckers in



GREAT HORNED OWL

attempts to steal the nest cavity, but the woodpeckers usually prevail. Nests and cavities can never be left unguarded. When the female wants a break from incubating, she calls to the male to relieve her. She waits for his return before flying off on her own errands.

Sometimes when cavities are scarce, American kestrels may also attempt to drive off occupants (like screech-owls) of nest cavities and kick their eggs out. An ornithologist reported finding a kestrel brood that included a baby screech-owl. The kestrel parents had apparently overlooked one of the eggs when they evicted the screech owls.

In the eastern U.S., purple martins use birdhouses and gourds almost exclusively, but in the Sonoran Desert region of Arizona martins nest in saguaros. The pair defends not only their nest cavity, but an extended area with several other saguaros with cavities in case they might need another one. Western screech-owls and elf owls also lay claim to more than one saguaro. The owls use a second nest cavity to store cached food and a third as a day roost for the father owl.

Keeping a nest cavity clean can be problematic. Both screech and elf owls are such good hunters that there is sometimes extra food in



GILDED FLICKER/GEORGE ANDREJKO

the nest. Researchers have occasionally found blind snakes in the nest that the sated owlets didn't eat. The blind snakes can live in the debris, eating predatory insects. Some species of ants also live in the cavities, feeding on the pests but leaving the nestlings unharmed.

Baby woodpeckers also help. After being fed, the baby woodpeckers turn around and present the parent with a tiny white sack containing the fecal matter. The parent takes it and flies off, dropping it away from the nest, so predators are not attracted to the nest by the scent. (Nature invented diapers first.) Flicker babies just cling to the walls of the nest chamber above the mess below.

The dreaded nonnative European starlings (and house sparrows) not only outcompete woodpeckers and other native birds for their cavities, but they also cram the hole so full of nest material that it sticks out of the hole. (Most cavity nesters like owls and woodpeckers don't add any nesting material.) They so befoul the nest cavity that other birds won't use it again.

### BEYOND BIRDS

But not only birds use these nest chambers. Other species, including bats, roost in old woodpecker

cavities. Bees build hives in the cavities, and beetles and other insects seek refuge from the day's heat inside. During cold snaps small birds that are not cavity nesters may sometimes shelter in the cavities, crowding in and huddling together to keep warm at night.

In addition to birds using saguaros to nest in or on, or as perches for hunting or viewing, some animals actually eat the saguaro cactus itself.

Desert bighorn sheep butt a saguaro to dislodge the spines and smash the outer covering, then eat the pulpy tissue inside for both moisture and nutrients. In dry areas jackrabbits may feed on saguaro flesh. Their sharp teeth marks and clean cuts help differentiate their feeding from a bighorn sheep's. (Like all ruminants, bighorn sheep have no upper teeth, and their munch marks are messy with ragged edges.) Rabbits and rodents regularly eat and kill small saguaros less than a foot tall.

Wood (pack) rats also chow down on saguaros in a serious way. They gnaw into the inner tissue and eat their way in a spiral tunnel around the saguaro. This distinctive spiral pattern always indicates wood rats at work. They usually feed on saguaro only when there isn't any prickly pear (their first choice) in the area.

Insects munch on saguaros as well. The small, defenseless seedlings are sometimes totally consumed by the cactus longhorn beetle. At the end of monsoon season the desert-encrusting termites appear, feeding on the dead bark-like parts of the saguaro. They cause no damage, simply tidying up and recycling dead tissue. Other insects — a tiny rhinoceros beetle and a sap beetle — feed on living saguaros but take tiny bites and do little damage.

### FLOWERS AND FRUIT

Most creatures are content to eat the flowers, nectar and fruit of saguaros rather than the cactus. The flowers bloom in May, providing a buffet for birds, insects and bats. The nectar-feeding bat (the lesser long-nosed bat) is the saguaro's main nocturnal pollinator, but if the flower doesn't get pollinated during the night, the secondary pollinators — doves, woodpeckers and bees — have their chance in the morning. The white-winged dove is the most important daytime pollinator of saguaros. White-wings and saguaros play significant parts in each other's life cycles.

Although the saguaro produces more nectar in the morning for the daytime pollinators, the nectar and pollen are really designed for bats, with the precise combinations of proteins, sugars and amino acids that bats need. New studies have found that the nectar contains amino acids that help mother bats support lactation, as they raise their babies during the same time saguaros are blooming.

In late June, when the heat is most intense and nearly everything else has shriveled up, the saguaro fruits ripen (in some years more than 100 fruits or 11 pounds per cactus). This juicy, succulent source of food and moisture is a bonanza for almost all desert creatures.

Birds gorge on the fruits, knocking them to the ground where coyotes, foxes, bighorn sheep, javelinas, rabbits, ground squirrels and many other herbivores and omnivores wait. Ants quickly carry off all 2,000 seeds from a fallen fruit within an hour.

In much of the Sonoran Desert, white-winged doves often depend heavily on saguaro fruits for their nutrition and much of their water in July. Their reproductive cycle is closely tied to saguaro fruiting. When the doves eat the fruit, the seed is destroyed, so although they are a main pollinator, they are not good seed dispersers (although some seed falls from their beaks). But in other animals, such as Gila woodpeckers, cactus wrens, bats or coyotes, the seed passes through the gut unharmed and germinates if the July rains are generous.

When the saguaro begins to die and rot, black ooze, with its distinctive odor, runs down the trunk, and the insect and arthropod population inside the cactus soars to more than 413 species. The saguaro becomes another whole ecosystem — a liquid one that supports many aquatic insects in the desert.

Even after the saguaro is dead and skeletonized, lizards, rodents, snakes and insects still find refuge in or on it. One researcher discovered a hibernating poorwill in the base of a saguaro skeleton. Turkey vultures like to perch on the skeletons — you might say it fits with their image.

Every part of this amazing cactus, both in life and in death, plays an important ecological role in sustaining other Sonoran Desert creatures. I stood in the rain musing about how many generations of birds, insects, bats and other animals this fallen saguaro had nurtured in its long life. I hoped its offspring would continue the cycle and there would be rooms in the cactus hotel for many generations to come. 🦋

■ Pinau Merlin enjoys visiting with saguaros and listening to each one's unique story.

### PROTECTED PLANT

The Arizona Native Plants Protection Law considers saguaros a "highly safeguarded" species, and harming or stealing one is a class 4 felony. A saguaro can only be sold or given away by a private landowner after applying to the Arizona Department of Agriculture for a permit and a tag that identifies the cactus as legally obtained and not stolen. Saguaro skeletons also are protected. Landscape saguaros are available for sale at cactus nurseries.



GEORGE ANDREJKO