Turkey Vulture

Cathartes aura

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DESCRIPTION. The name *Cathartes* comes from a Greek verb meaning "to cleanse," hence the noun, "the purifier," referring to the ecological role of this group of birds. The specific name, *aura*, is a Native American name that is still used in Spanish vernacular in many parts of Mexico to distinguish the Turkey Vulture from the *zopilote*, or Black Vulture.

Turkey Vultures are rather large-bodied birds, with a total length of 24–28 inches, wingspan of 61–71 inches, and weight of 2.6–5.3 pounds (Wheeler and Clark 1995; pers. observ.). The race that breeds in the Southwest, *C. a. aura*, generally weighs 2.6–2.8 pounds, while northern migrants, *C. a. meridionalis*, weigh about 3.2 pounds. The *aura* form has shorter wings and tail (wing chord usually well under 19.5 inches, tail to 10.5 inches), although bent, broken, or molting outer primaries often make wing measurements inaccurate. The smaller subspecies is best identified by its shorter wing bones (humerus less than 5.75 inches, ulna less than 7 inches, carpometacarpus less than 3.25 inches).

The Turkey Vulture appears to be a uniformly dark, almost blackish brown, except in flight, when the silvery undersides of the primaries and secondaries contrast with the dark leading edges of the wings and body (plate 2). In flight at a distance, the shallow V of the wings is the best field character. The silver and blackish contrast of the underparts is distinctive when the birds are closer. Unlike the California Condor and the Black Vulture, the Turkey Vulture has relatively narrow wings and tail.

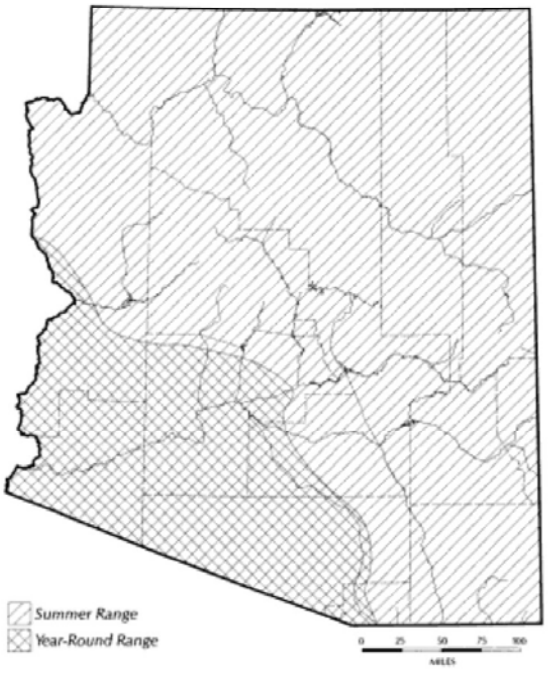
In adults, the naked red head contrasts with the brown body. The bill is ivory white, the iris ashy. Some Turkey Vultures have white tubercles, particularly in the area in front of the eyes, but the presence of tubercles varies among individuals and is not correlated with age or sex. When clean, the feet, too, are red, but usually this color is obscured by the chalky white urates that build up from urohidrosis (see *Black Vulture*).

In their first year, Turkey Vultures are blackish everywhere—head, bill, feet, nails, and plumage—except on the underside of the wings. When young birds join the communal roosts in late summer, they are readily distinguishable from the adults. It takes 13–15 months for young birds to acquire the white bill and red head skin of adults. Their overall dark color may cause young Turkey Vultures to be confused with Black Vultures. Body shape is a more reliable character than color in fall and winter, when young of the previous season mix with adults. Turkey Vultures have short legs, short heads, and narrow wings and tails, whereas Black Vultures have just the opposite characteristics. The only bird likely to be confused with a Turkey Vulture at a distance is the Zone-tailed Hawk, a successful mimic.

New World vultures are anatomically unable to make vocal sounds, but this does not mean that they are incapable of making sounds. Turkey Vultures in an ambivalent situation, as when approaching something that may be alive, stomp one foot rapidly. When disturbed at night, they may stomp the roost branch. Fighting or frightened vultures may hiss. Young birds make a grunting sound when begging for food or preening. Adults retain the grunt, using it during courtship and for other communication between the pair. Body posture also serves as a means of communication in this species.

DISTRIBUTION. In the breeding season, Turkey Vultures range from southern Canada to the more southern parts of South America (L. Brown and Amadon 1968). The availability of unfrozen carcasses is probably the factor that limits their distribution toward the poles. In winter, most Turkey Vultures are absent from the majority of their temperate range in interior western North America.

During the warm season, some Turkey Vultures can be found at almost all elevations throughout Arizona. Their numbers vary greatly, however, probably due in large part to the availability of food. The small nominate subspecies of Mexico, *C. a. aura*, ranges northward in the breeding season throughout all of Arizona, New Mexico, and the western half of Texas, through at least southern Nevada and probably southern Utah and Colorado. A study of the subspecies (Rea 1983) has shown that probably all the birds that summer here (April–October) vacate Arizona in winter. All winter specimens so far measured are members of a larger subspecies from the northern part of the continent that wander in southwestern Arizona.



Turkey Vulture distribution in Arizona

HABITAT. Turkey Vultures do not seem to prefer any particular habitat type, and they can be found flying over virtually all the life zones of the state. Their need for openness is questionable. Perhaps open terrain helps Turkey Vultures maneuver toward carcasses on the ground, but since they find their food by smell (Stager 1964), they do not need open terrain to hunt.

Turkey Vultures roost communally. Roosts are often in large trees such as cottonwoods or tamarisks, sometimes in quite populated areas. One traditional roost in Hermosillo, Sonora, was in eucalyptus trees in an elegant housing complex. At least one Arizona roost was on exposed boulders high in the Sierra Estrella near Phoenix. Roosts in Arizona are usually in riparian habitats, where tall trees afford protection, but elevated rock outcrops and cliffs are also used as roosting sites. Near Black Canyon City, Arizona, R. L. Glinski (pers. comm.) noted a large roost on electrical transmission towers.

LIFE HISTORY. New World vultures lack the ability to close their toes and claws. Since they are unable to grasp and capture live prey, they must instead rely on discovering animals that are already dead. Turkey Vultures, with their long, relatively narrow wings and tail, are specialized for soaring. They circle through warm updrafts, wasting little of their own energy. Once inside a rising column of air, they spiral upward, the wings held at a slight dihedral. When a vulture detects some clue to a carcass, visual or olfactory, it drops rather quickly, tipping and tilting until near ground level. If the lead is false, the vulture may be so low that it has to use a few deep and powerful wing strokes to gain another thermal. If carrion is present, the bird lands a short distance away from it and approaches cautiously on foot, seldom directly. It will circle or semicircle first in one direction and then the other,

closing the radius. Though a master of the air, the short-legged Turkey Vulture is vulnerable on the ground. When uncertain, it may stamp one foot on the ground in staccato fashion and may also hold its wings extended up over its back. It takes no chances. When at last the bird gets near enough to the carrion to make a sideways jab with its bill, it is still poised to jump back at any sign of movement.

Once the vulture is convinced that the carcass is safe, it begins to eat. Something small such as a road-killed bird, rodent, or reptile may be gulped down whole. But a larger carcass, such as a rabbit or larger mammal, will be explored for openings. The eyeballs are usually plucked out first. Other areas of easy entry are the mouth, genitals, and anus. Later arrivals may dispense with the cautious preliminaries and begin tugging at the carcass quite directly if other vultures are present.

The debate over the role of olfaction in Turkey Vultures began in the days of Audubon and did not end until Kenneth E. Stager (1964) devised a series of experiments that incorporated birds foraging in the wild. Using ethyl mercaptan, an organosulfur compound that approximates the stench of carrion, he demonstrated that Turkey Vultures were indeed attracted by the odor, which they detected while soaring upwind of the dispenser. Old World (Accipitrine) vultures and other species of New World vultures were unable to locate the chemical—or, for that matter, carcasses they could not see.

Contrary to popular opinion, vultures do not prefer putrid food. Captive birds on a stable diet select the freshest morsels and refuse tainted or rotten meat—and even the cheaper grades of canned dog food, as I learned from personal experience. Wild birds probably feed most often on animals found within a day or so of death. But circumstances sometimes dictate otherwise. A large herbivore in a hot country may be quite ripe before the last of the flock of vultures finishes with it. If other food is available, however, even wild birds will ignore a badly decomposed carcass.

The Turkey Vulture is a very private bird. Not only is it cautious about eating and bathing in public, but its courtship, mating, and family life have also been largely hidden from the eyes of those who wish to record such things in learned journals. This lack of knowledge is surprising for a bird so common and so widely distributed.

Rare observations of courtship indicate that it involves some stately posturing on the ground and inflation of gular sacs, which are bright pink. This is based on the behavior of captive birds I raised and on extensive fieldwork in western Texas by D. Davis (1983). Unlike the diurnal raptors, Turkey Vultures lack spectacular aerial and vocal displays.

Questions about the life history of Turkey Vultures far outnumber the answers. It seems that many vultures in the Southwest do not breed at all. I have examined quite a few dead vultures during what should have been the breeding season, and only a small percentage showed indications of recent gonadal activity. Is this because there is a great surplus of birds without territories? Or perhaps because vultures take a very long time to reach sexual maturity? A careful study of Arizona's communal roosts might provide some answers. It is not uncommon for 50–100 individuals to assemble at some particular tree or grove throughout the summer to roost, but whether these birds are unmated or the mates of birds sitting on nests is unknown. When young fledge, they join local roosts. Do two parents accompany them or only one? Watching the behavior of adults when young enter the roosts might tell how many are parts of families. Marking young birds with wing tags for individual recognition might also supply some answers.

The few nest sites I have seen in the Southwest were in high, open places where the incubating bird could easily detect and avoid intruders. One nest was on a cliff overlooking the river near Camp Verde, Arizona.

Even though apparently few Turkey Vultures breed during any one year, they do not compensate with high fecundity. The female lays two (rarely one or three) spotted eggs on the sandy floor of a cavity. There is no attempt at nest building, just a scrape. Both members of the pair share in the in-

cubation, which lasts 38–41 days. The hatchlings are covered with pure white down, and most of the body acquires at least one change of down plumage before the black immature feathers begin to appear on wings and tail and along the main tracts of the body plumage. The young fledge in approximately six to eight weeks (D. Davis 1983; Ritter 1983).

The hiss of young in the nest, usually emanating from some dark recess, is suggestive of a rattlesnake, and this must be an important defense mechanism. If hissing fails to deter a predator (or ornithologist), the young may attack, then regurgitate their foul-smelling crop contents. Adults also hiss and vomit when handled.

The Zone-tailed Hawk's mimicry of the Turkey Vulture has long been the subject of speculation. What advantage does a hawk gain from mimicking a vulture? Migrating Zone-tailed Hawks even join Turkey Vultures at their roosts in Arizona. Most birds that mob hawks or owls ignore vultures, recognizing them as harmless. If a hawk looks like a vulture, it can trick potential prey and fly in close for a kill. I suspect that occasional reports of vocalizing vultures are attributable to misidentified zone-tails as well.

Although some Turkey Vultures can be found throughout the year in the lower, warmer parts of the state, the breeding population is here only from April through early fall. Most, if not all, of these birds have departed by the end of October. Migrants belonging to the larger northern race arrive in Arizona in late August. Most are in passage, but a few remain for the winter. The spring movements of this large race are unknown; there are no Arizona records for that season.

In spring and fall, large flocks of Turkey Vultures pass through the deserts, particularly in western Arizona and southwestern California. They may travel in tight groups or as well-spaced individuals. The lower Colorado River valley is also an important vulture flyway through the Southwest (K. V. Rosenberg et al. 1991). The bulk of the birds pass through between 28 September and 5 October. Up to 750 individuals have been counted in a single day. Spring migration is more protracted, but 350 vultures were counted crossing the river between Yuma and Blythe on 15 March. Presumably these all belonged to the larger subspecies, which breeds in the Northwest.

One of the most interesting aspects of Turkey Vulture migration in southern Arizona is the sudden appearance of large flocks from the north in late fall or winter, well after regular fall migration is over. These may number from a dozen or so to flocks of more than 50. Often they arrive just ahead of a storm and are gone early the next morning or within a few days. I have termed these movements "frost flights" (Rea 1983). I suspect that flocks linger in some milder regions to the north until they are finally driven to migrate by a big winter storm, which freezes the available food. The entire roost then departs southward, passing quickly through the Southwest.

In the desert, Turkey Vulture roosts are often in cottonwoods or in groves of exotic trees such as tamarisks or eucalyptus. A summer roost that has been used for many years is at the Boyce Thompson Arboretum near Superior, Arizona. Here, from spring through fall, more than 100 birds congregate each evening, occasionally joined by Crested Caracaras, Black Vultures, and Zone-tailed Hawks. Often, migrating Turkey Vultures join local birds at their roost as evening approaches, resuming flight early the next morning while the summer residents are still sunning.

STATUS. The Turkey Vulture is protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711) but is not listed or proposed for listing by the U.S. Fish and Wildlife Service or the Arizona Game and Fish Department as rare, threatened, or endangered. Nevertheless, in the 1970s, A. R. Phillips (pers. comm.) and I observed that Turkey Vulture numbers had declined in Arizona as elsewhere in the Southwest and in northwest Mexico. The causes probably vary. Better range manage-

ment techniques and better sanitation methods, particularly at landfills, mean fewer carcasses for scavengers. Open highways dependably provide food items, particularly smaller items such as snakes, birds, and rabbits, but too often vultures themselves become roadkills. The current status of this bird in Arizona is unknown.

All members of the family are highly sensitive to lead poisoning. Vultures may be killed by consuming even small amounts of lead shot or bullet fragments (e.g., from game shot but not retrieved by hunters or from discarded offal). Lead absorbed into the bloodstream reduces peristalsis in the gut, resulting in starvation. At higher levels it produces muscular spasms. Sometimes a poisoned vulture can be saved by chelating the lead from the bloodstream.

Perhaps the greatest cause of mortality is pesticide poisoning. Although the sale of DDT has been prohibited in the United States since 1973, it is still manufactured and sold to Third World countries. The Turkey Vultures that breed in Arizona spend approximately five months of the year in Latin America, where they are exposed to DDE, a toxic metabolite of DDT. Thinner eggshells are among the results of such exposure (Wilbur 1978a). Nonlethal chemical poisoning may be one explanation for the large numbers of apparently nonbreeding Turkey Vultures at communal roosts throughout the summer.