

## Zone-tailed Hawk

(*Buteo albonotatus*)

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THE ZONE-TAILED HAWK (*Buteo albonotatus*) might well be dubbed “the Great Pretender,” because it so closely resembles the ubiquitous Turkey Vulture (*Cathartes aura*) in appearance and behavior as to be frequently mistaken for it. In the border regions where it lives, it may be confused as well with another “Mexican” raptor, the Common Black-Hawk (*Buteogallus anthracinus*). In fact, a nesting pair of hawks in Harding County was initially reported as the northernmost breeding record for Common Black-Hawk, but subsequently identified correctly as Zone-tailed Hawk (Bohl and Traylor 1958).

Zone-tails are medium-large buteos, averaging 51 cm (20 in) in length, 129 cm (51 in) in wingspread, and 830 g (1.8 lbs) in weight, with females tending to be larger than males (Clark and Wheeler 1987). Compared to Red-tailed Hawks (*Buteo jamaicensis*), Zone-tails are slim and lanky: they are almost equal in length, have a slightly greater wingspan, yet weigh 23% less on average (see Clark and Wheeler 1987). Their wings are long and narrow for a buteo species, shaped much like those of the larger Turkey Vulture instead. The superficially similar Common Black-Hawk has much broader wings and a shorter tail in flight.

Like the Turkey Vulture and the Common Black-Hawk, the Zone-tailed Hawk is predominantly black



PHOTO 17.1

The Zone-tailed Hawk is predominantly blackish in color. The cere and legs are yellow. The lores are gray, whereas they are yellow in the similar-looking Common Black-Hawk (*Buteogallus anthracinus*). Steeple Rock Canyon, Hidalgo Co., 2 May 2003.

PHOTOGRAPH: © ROBERT SHANTZ.



PHOTO 17.2

(top left) Zone-tailed Hawk in flight, Bitter Creek, Grant Co., 23 June 2007. In flight, the Zone-tailed Hawk can be difficult to distinguish from a Turkey Vulture (*Cathartes aura*). The two species have similar silhouettes. Their underwings are two-toned, with dark coverts contrasting with paler flight feathers. Both the Turkey Vulture and the Zone-tailed Hawk also fly in a strong dihedral, rocking from side to side. However, the Turkey Vulture lacks the fully feathered head, the yellow cere, the tail boldly barred in black and white, and the heavy barring on the flight feathers, all found in the Zone-tailed Hawk. PHOTOGRAPH: © ROBERT SHANTZ.

PHOTO 17.3

(bottom left) Zone-tailed Hawk in Steeple Rock Canyon, Hidalgo Co., 30 June 2003. Note the heavy barring on the silvery flight feathers and the bands on the topside of the tail, gray instead of white as on the underside. PHOTOGRAPH: © ROBERT SHANTZ.

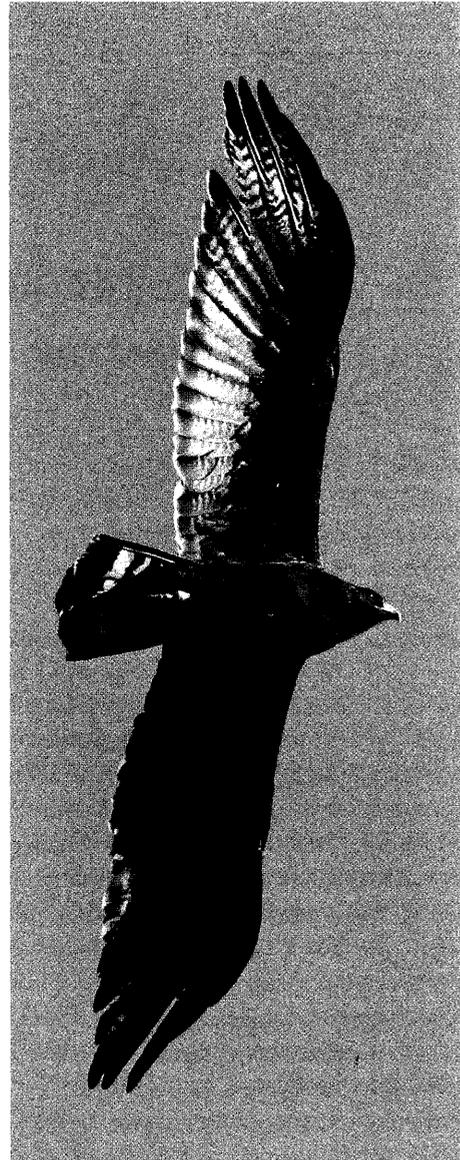


PHOTO 17.4

(above) Zone-tailed Hawk in Steeple Rock Canyon, Hidalgo Co., 7 June 2003. The Zone-tailed Hawk has long, narrow wings rather than the broad wings of the Common Black-Hawk (*Buteogallus anthracinus*). The tail of a female Zone-tailed Hawk (photo) has one wide and two narrow white bands. The tail of a male has only one wide and one narrow white band. PHOTOGRAPH: © ROBERT SHANTZ.

or blackish in color. Adult birds have the tail boldly barred in black and white, the females having three white bands, the males just two (Clark and Wheeler 1987). The undersides of the flight feathers are subtly barred in silvery-gray and dusky, and contrast strongly with the black wing coverts, adding to the vulture-like effect. Unlike vultures, however, the head is fully feathered in black, and the cere and legs are bright yellow. When perched, a Zone-tailed Hawk can be distinguished from a Common Black-Hawk by its gray lores (yellow in the Black-Hawk). It also lacks the unusually long legs of the other species (see chapter 12).

In contrast to most other hawks, the plumage of immature Zone-tails differs little from that of adults: some white spotting on the breast and narrower bars in shades of gray in the tail are the main differences. Also unlike other buteos, this species has no light phase. No subspecies are recognized (Johnson et al. 2000).

## Distribution

The Zone-tailed Hawk is primarily a raptor of the American tropical and subtropical regions; only the northernmost 5% of its breeding range occurs in

the United States (Snyder and Glinski 1988). It breeds locally from the southwestern United States south through Mexico, Central America, and northern South America to Peru west of the Andes and, east of the Andes, to eastern Bolivia, Paraguay, and southeastern Brazil (AOU 1998). Populations in the northernmost part of the range (including all U.S. birds) are essentially migratory; elsewhere they are resident. Birds regularly winter as far north as northern Mexico (Baja California, Sonora) (AOU 1998). Occasional individuals have even been reported in winter from lower-elevation areas of southern California, Arizona, New Mexico, and the Lower Rio Grande region of Texas (Snyder and Glinski 1988), but where the bulk of the migrant population spends the winter months remains unknown.

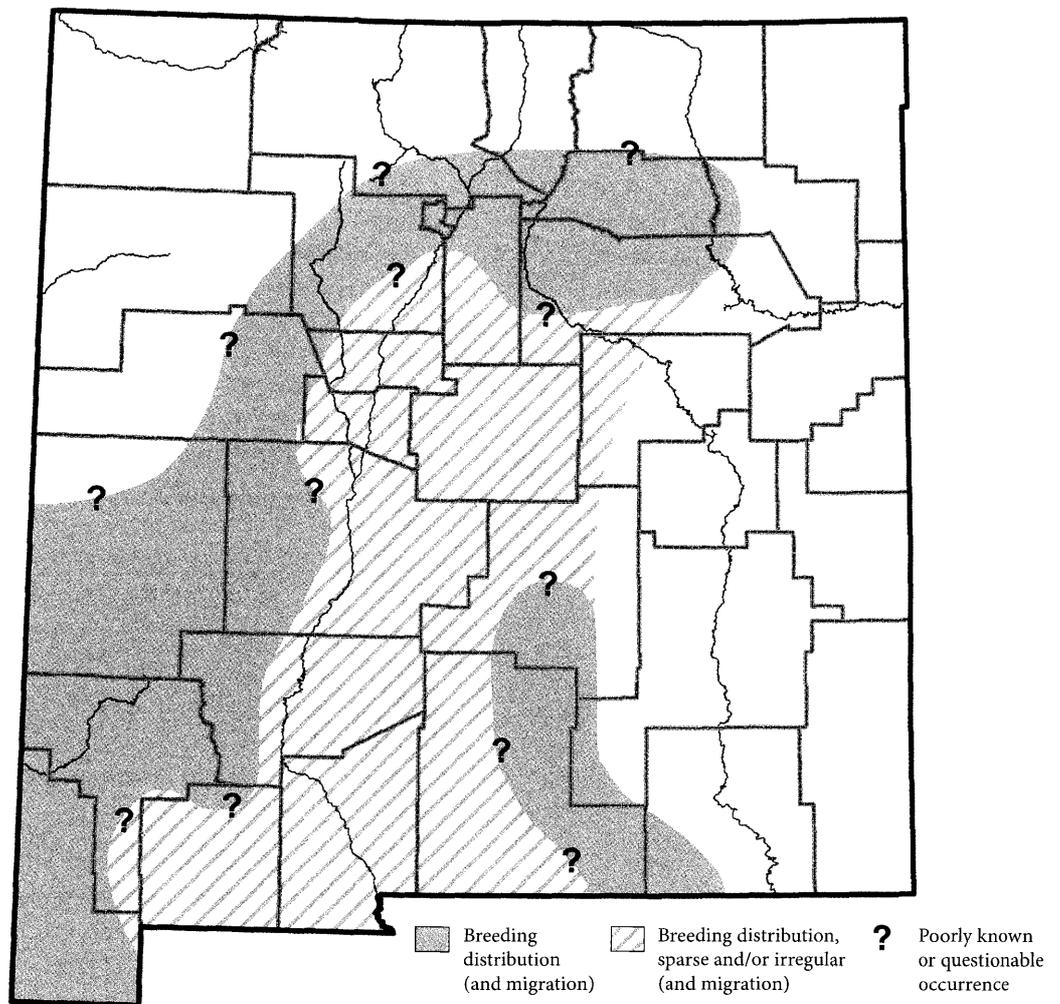
Within the United States, breeding Zone-tailed Hawks are found locally from western Arizona east across New Mexico into southwestern Texas, and sporadically in southern California (Matteson and Riley 1981; Snyder and Glinski 1988; AOU 1998; Johnson et al. 2000). Additionally, sightings of Zone-tailed Hawks have recently increased in southwestern Utah and in southern Nevada, with nesting documented in 2005 in the latter area (Fridell 2005). Snyder and



PHOTO 17.5

Most of New Mexico's Zone-tailed Hawk breeding population appears to be concentrated in Hidalgo and Grant counties in the southwest. Here, a Zone-tailed Hawk in Steeple Rock Canyon north of Virden, Hidalgo Co., 24 May 2003. Steeple Rock drains westward into the Gila River.

PHOTOGRAPH: © ROBERT SHANTZ.



MAP 17.1

Zone-tailed Hawk distribution map

Glinski (1988) estimated a total of just 100 pairs breeding within the United States, most of them occurring in Arizona.

In New Mexico, Zone-tailed Hawks breed in small numbers across much of the southwestern part of the state north very locally as far as the Jemez Mountains, and along the Canadian River, in Mills Canyon in Harding County (Bohl and Traylor 1958; Ligon 1961; Hubbard 1978; Travis 1992; Williams 1992; NMOS 2008). Zone-tail breeding pairs are also reported frequently from the Guadalupe Mountains (especially

Turkey Canyon) and the Sacramento and Capitan mountains in the southeastern quadrant of the state (Ligon 1961; NMOS 2008). While nowhere can the species be considered common, most reports of breeding birds—probably indicating where the highest densities are found—come from rugged, wooded, or semiwooded areas of Grant and Hidalgo counties. Zone-tailed Hawk nests have been reported from multiple locations within those two counties, including along the Gila River from well up in the Gila National Forest downstream to the Arizona state line and

various canyons in the Peloncillo and Animas mountains (NMOS 2008).

At the northern limit of the species' distribution in New Mexico, a small breeding population has been documented in the Jemez Mountains, including at Bandelier National Monument, Los Alamos County (Southwest Parks and Monuments Association 1986; Travis 1992; Kennedy et al. 1995). Breeding has also been reported fairly regularly at Mills Canyon along the Canadian River since 1956 (e.g., Bohl and Traylor 1958; Ligon 1961; Williams 2005; H. Schwarz, pers. comm.). In the large swath of territory from Grant County north and east to Jemez Springs, Sandoval County (see Hubbard and Baltosser 1978, *vide* B. Heinrich), or between the Jemez Mountains and Mills Canyon, breeding has apparently been documented only in the San Francisco Valley of Catron County (Snider 1992, *vide* S. Williams). However, Hart Schwarz also found a territorial Zone-tailed Hawk in Bear Trap Canyon in the San Mateo Mountains of Socorro County on 24 May 2000 (Williams 2000). Breeding season sightings have been reported from other locations including in Doña Ana, Bernalillo, and San Miguel counties and north to Rio Arriba County (NMOS 2008), and these observations probably represent at least occasional breeding. Although not yet reported, Zone-tailed Hawks may breed in seemingly

suitable canyon country in Cibola, McKinley, Valencia, and perhaps even Mora or Taos counties. However, they are absent as breeders from the eastern plains.

Zone-tailed Hawks have been reported as vagrants in much of the state (NMOS 2008), including San Juan County in the northwest (Snider 1995). Most vagrants seem to occur in spring and fall, and so are likely to be migrants that have wandered off course. Migrants appear regularly albeit in very small numbers at Hawk-Watch International's monitoring sites in the Sandia and Manzano mountains; the maximum seasonal total in recent years was 10 in the spring of 2000; one to three in a season is the norm (Smith 2004; chapter 2). Unlike for many other raptors, most reports of Zone-tails in migration are of single birds, although migration in small groups may be more common than reported because of problems distinguishing them from vultures.

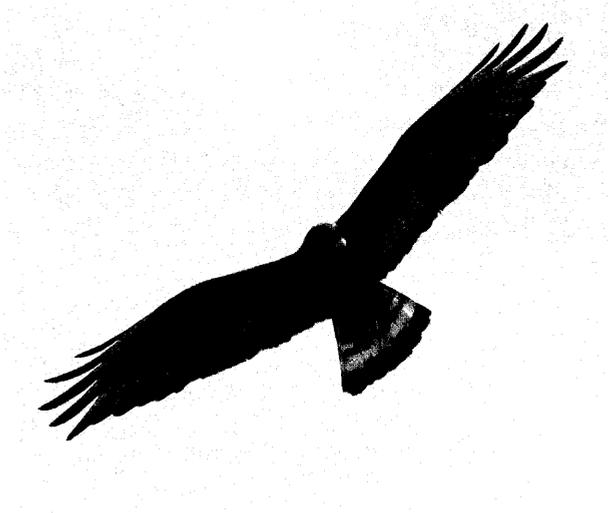
## Habitat Associations

Zone-tailed Hawks hunt over a wide range of open and forested habitats (Johnson et al. 2000). For nesting, however, the species shows a strong association with water (Murphy 1978; Johnson et al. 1987) and either gallery forests or rugged topography with some



PHOTO 17.6

Zone-tailed Hawk in flight in Steeple Rock Canyon, Hidalgo Co. Note the rugged topography in the background. 17 May 2003. PHOTOGRAPH: © ROBERT SHANTZ.



PHOTOS 17.7a and b

(top) Typical Zone-tailed Hawk habitat in New Mexico, with rugged topography and wooded riparian vegetation in the canyon bottom: Gila Lower Box near Box Canyon confluence, Hidalgo Co., 14 August 2007. PHOTOGRAPH: © ROBERT SHANTZ.

(bottom) Zone-tailed Hawk in Gila Lower Box, Hidalgo Co., 19 April 2008. PHOTOGRAPH: © ROBERT SHANTZ.

forest component (Porter and White 1977; Millsap 1981; Johnson et al. 2000). Typical for the species is to find it nesting in large trees or on cliffs situated in riparian woodlands or forested canyons up to 2,200 m (7,220 ft) in elevation (Johnson et al. 2000). Breeding locations have been described across the species' northern range, though studies of breeding habitat are limited to one each in Arizona (Millsap 1981), New Mexico (Kennedy et al. 1995), and Texas (Matteson and Riley 1981). Nests

in the Jemez Mountains of north-central New Mexico were situated in montane forests within or near steep-walled canyons, many of them with extensive cliffs (Kennedy et al. 1995). In lower-elevation areas of New Mexico's Gila River drainage, nests are typically located in groves of mature riparian trees, usually cottonwoods (*Populus fremontii*) and again typically in the vicinity of steep slopes or large rock outcrops (Hubbard 1971; Johnson et al. 1973; GS and SHS, pers. obs.). Similarly,



PHOTOS 17.8a and b

(top) Steeple Rock, Hidalgo Co.

PHOTOGRAPH: © ROBERT SHANTZ.

(bottom) Zone-tailed Hawk  
at Steeple Rock Canyon,

10 May 2003. PHOTOGRAPH:

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all Arizona nests located by Millsap (1981) were in areas of varied topographic relief or immediately adjacent to cliffs or steep talus, while west Texas nests were found in montane forests or rugged canyons (Matteson and Riley 1981). Cliff nesting has been reported in Texas (Matteson and Riley 1981) and Arizona (Bailey 1928).

Twelve nests found in north-central New Mexico (Kennedy et al. 1995) were in stands of ponderosa pine (*Pinus ponderosa*) and oak (*Quercus* spp.) or ponderosa

pine, Douglas fir (*Pseudotsuga menziesii*), and oak. Other known nesting areas in New Mexico include montane sites in the Peloncillo, Animas, and Mogollon mountains (Williams 1992, 2003), and wooded canyons on the Canadian River (Bohl and Traylor 1958; Williams 1995) and in the Guadalupe Mountains (Williams 2003). Additional areas of nesting described by Ligon (1961) appear to be primarily montane canyons. Zone-tailed Hawks will occasionally nest in broad, low-gradient

floodplains as well, such as along the Gila River in Grant County. Zone-tails are not averse to nesting close to man, and adapt readily to regular low-level activities such as ranching or farming, common in such floodplain areas (Snyder and Glinski 1988). In summary, while the diverse diet of the Zone-tailed Hawk allows exploitation of prey in nonforested areas, preference for protected nest locations in tall trees or rugged topography near waterways presumably limits nesting distribution to a relatively few, dispersed areas in New Mexico and the greater Southwest.

Habitat associations of migrating Zone-tailed Hawks are poorly understood (Johnson et al. 2000). Most observations of birds migrating in the Southwest have been made from montane forest locations such as HawkWatch International's sites in New Mexico's Sandia Mountains (in spring) and Manzano Mountains (in fall) (chapter 2). Several riparian canyon sites in the foothills of mountain ranges have multiple observations during spring or fall migration (NMOS 2008). Occasionally, however, individual migrants are observed in areas of little topographic relief such as the North Roosevelt (or Melrose) Migrant Trap, a small, isolated area of mature cottonwoods in Roosevelt County (Williams 1999).

## Life History

### Displays

Zone-tail pairs regularly engage in a variety of aerial displays, especially during courtship. These include dives, rolls, loops, and whirling, in which two birds lock talons and spin toward the ground. This whirling behavior was first reported in Zone-tailed Hawks by Hubbard (1974) based on observations made in New Mexico's Gila Valley. Clark (1984) suggested that it represented agonistic behavior between territorial breeding birds and intruders, rather than courtship behavior. However, Kennedy et al. (1995) document frequent displays between paired birds throughout the breeding season. Most displays are accompanied by loud, high-pitched vocalizations.

Human or other intruders in the vicinity of a nest will be met by one or both adults screaming their plaintive nasal cry while soaring overhead. Close approach to an active nest is likely to provoke rather more aggressive

and seemingly fearless responses: birds will dive at and even strike at intruders (Johnson et al. 2000). Wilson et al. (1993) reported a Zone-tailed Hawk family diving at a mountain lion (*Felis concolor*) in south Texas.

### Nesting

In the Southwest in general, many Zone-tailed Hawks arrive on their breeding territories in late March to early April (e.g., Kennedy et al. 1995). Pairs show strong fidelity to nest sites, and courtship and copulation often take place near old nests (Snyder and Glinski 1988). Nests are constructed of twigs and bark. Like numerous other hawks, Zone-tails decorate their nests with fresh green plant material, presumably to help reduce ectoparasite loads (Wimberger 1984).

While no studies of nest-site selection have been conducted in North America, information is available at the local scale of nests. Arizona nests (Millsap 1981) were located in mature ponderosa pine, Arizona alder (*Alnus obliquifolia*), cottonwood, and Arizona sycamore (*Platanus wrightii*) ranging from approximately 10 to 24 m (33 to 79 ft) tall and 51 to 98 cm (20 to 39 in) in diameter. Nests in north-central New Mexico were situated in ponderosa pines averaging 24 m tall (79 ft) and 60 cm (24 in) in diameter (Kennedy et al. 1995). Along the Gila River and in tributary canyons, nest trees included cottonwoods and Arizona sycamores



PHOTO 17.9

Zone-tailed Hawk pair in Steeple Rock Canyon, Hidalgo Co., 30 June 2003. PHOTOGRAPH: © ROBERT SHANTZ.



PHOTO 17.10

Zone-tailed Hawk in a nest in a cottonwood (*Populus fremontii*), Steeple Rock Canyon, Hidalgo Co., 17 May 2003. PHOTOGRAPH:

© ROBERT SHANTZ.



PHOTO 17.11

Zone-tailed Hawk in a nest in an Arizona sycamore (*Platanus wrightii*), Bitter Creek, Grant Co., 23 June 2007. PHOTOGRAPH:

© ROBERT SHANTZ.



PHOTO 17.12

Zone-tailed Hawk nest with adult feeding nestling, Bitter Creek, Grant Co., 23 June 2007.

PHOTOGRAPH: © ROBERT SHANTZ.

(see photos). In both north-central New Mexico (Kennedy et al. 1995) and the Cliff-Gila Valley (SHS and GS, unpubl. data), nests were consistently located within the top 25% of the supporting substrate, with many nests within the uppermost 10%. Nesting studies throughout the southwestern United States also consistently report the prevalence of cliffs or steep slopes in close proximity to nest trees. In Arizona, nests were situated in areas with steeper slopes than nests of Cooper's Hawks (*Accipiter cooperii*), Red-tailed Hawks, and Common Black-Hawks (Millsap 1981).

Egg-laying dates in the United States generally range from late March to mid May (Palmer 1988). First egg dates for the Jemez nests were estimated to be in the first week of May (Kennedy et al. 1995) and are likely to be similar elsewhere in New Mexico. One to three eggs (typically two) are laid and incubated primarily by the female for 28–35 days (Snyder and Glinski 1988; Johnson et al. 2000). The incubating female is fed by her mate. Once eggs hatch, the female continues to brood the young until they reach about 28 days old. Young fledge after 42 to 56 days in the nest, typically in July or August (Kennedy et al. 1995; Johnson et al. 2000). They continue to receive food from the parents until family units break up in September (Kennedy et al. 1995).

Male Zone-tailed Hawks do most of the hunting and provide most of the food through the nesting cycle. During incubation, the male delivers two to three prey items per day to the sitting female, taking her place on the eggs while she eats (Johnson et al. 2000). Once the eggs hatch, males typically deliver prey to the female in an aerial exchange away from the nest; she then returns to the nest to dismember the prey and feed it to the chicks (Kennedy et al. 1995; Johnson et al. 2000). Rates of prey delivery reported from New Mexico nests ranged from 4.8 to 8 prey items per day, depending on brood size and stage (Kennedy et al. 1995). As in many raptors, food shortage may induce siblicidal aggression among nestlings (Johnson et al. 2000).

### *Diet and Foraging*

Zone-tailed Hawks are primarily aerial hunters, scanning for prey while coursing 15–150 m (50–500 ft) over relatively open country such as fields, pastures, desert grasslands, or even open rocky areas in montane

forests (Zimmerman 1970; Snyder and Glinski 1988). In Arizona, Millsap (1981) observed that while riparian habitats provided primary nesting, roosting, and resting cover, most foraging occurred in adjacent uplands, up to 26 km (16 mi) from nests. Once a potential victim is spotted, the hawk drops into a steep stoop with partially closed wings. Occasionally Zone-tailed Hawks hunt from perches (Johnson et al. 2000).

The diet of Zone-tailed Hawks includes a variety of small to medium-sized mammals, birds, reptiles, and amphibians, augmented by an occasional invertebrate (Johnson et al. 2000). The relative importance of these various taxa in the diet varies among regions and habitats; typically Zone-tailed Hawks show a rather heavier use of birds and reptiles than do most sympatric *Buteo* hawks (Hiraldo et al. 1991; Johnson



PHOTO 17.13

Zone-tailed Hawk eating a ground squirrel, Steeple Rock Canyon north of Virden, Hidalgo Co., September 1992. The diet of the Zone-tailed Hawk has not been studied in southwestern New Mexico although hispid cotton rats (*Sigmodon hispidus*) may be important prey in parts of the Gila River Valley. In the Jemez Mountains, Zone-tailed Hawks prey on Red Crossbills (*Loxia curvirostra*), Northern Flickers (*Colaptes auratus*), and other birds, in addition to lizards and mammals such as the rock squirrel (*Spermophilus variegatus*). PHOTOGRAPH:

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The Zone-tailed Hawk's resemblance to the Turkey Vulture (*Cathartes aura*), both physically and behaviorally, may help the Zone-tailed Hawk during hunting. Used to the common and ubiquitous vultures, small animals may not recognize the Zone-tailed Hawk as the predator that it is until it is too late. Zone-tailed Hawks may also mingle with Turkey Vultures while hunting, further increasing prey deception. Zone-tailed Hawk in Steeple Rock Canyon, Hidalgo Co., 7 June 2003. PHOTOGRAPH:

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et al. 2000). Prey taken by Zone-tails range in size from mice and lizards (e.g., *Sceloporus* spp.) to ground squirrels (*Ammospermophilus* spp., *Spermophilus* spp.), cottontails (*Sylvilagus* spp.), and quail (*Callipepla* spp., *Cyrtonyx montezumae*) (Cottam 1947; Zimmerman 1976; Snyder and Snyder 1991; Johnson et al. 2000).

To date, the only published diet information from New Mexico is derived from Kennedy et al.'s (1995) study in the Jemez Mountains. Based on prey remains and castings at nest and roost sites as well as on prey deliveries at nests, the authors of that study documented extensive use of birds, mammals, and reptiles, although the relative importance of each of these taxonomic groups varied greatly with sampling method. Prey taxa heavily utilized by the Jemez Mountains Zone-tailed Hawk population included *Crotaphytus* lizards and *Tamias* chipmunks. Among the birds preyed upon by Zone-tailed Hawks in the Jemez Mountains were the Common Nighthawk (*Chordeiles minor*), Northern Flicker (*Colaptes auratus*), Steller's Jay (*Cyanocitta stelleri*), Western Scrub-Jay (*Aphelocoma californica*),

American Robin (*Turdus migratorius*), and Red Crossbill (*Loxia curvirostra*). The rock squirrel (*Spermophilus variegatus*) and Abert's squirrel (*Sciurus aberti*) were also identified as prey of the Zone-tailed Hawk in the Jemez Mountains (Kennedy et al. 1995).

In Durango, Mexico, Zone-tails feed extensively on cotton rats (Hiraldo et al. 1991), and the same may be true in at least some parts of the Gila River Valley. We frequently watched a Zone-tail pair that hunted over riparian pastures in the Cliff-Gila Valley carrying hispid cotton rats (*Sigmodon hispidus*) toward their nest; we never observed them with any other recognizable prey species. An early report by Anthony (1892) also noted that Zone-tails were numerous in April around prairie dog colonies near what is now Hatchita, suggesting they may have preyed on prairie dogs, although these rodents have not been reported as a prey species elsewhere (Johnson et al. 2000).

Zone-tailed Hawks not only resemble Turkey Vultures physically, but also in their flight style, exhibiting a strong dihedral and occasional rocking. Often they

soar among a group of Turkey Vultures while foraging, perhaps as camouflage. Willis (1963) postulated that the Zone-tail's strong physical resemblance to the Turkey Vulture may be a form of aggressive mimicry, which allows the hawk to closely approach potential prey that are habituated to the presence of the ubiquitous vultures (but see Mueller 1972). Snyder and Snyder (1991) report the capture success rate of Zone-tails in Arizona was significantly greater when soaring with vultures (30% successful) than when flying alone (7% successful), based on a sample of 55 observations. It is noteworthy that once a Zone-tail flying among vultures has spotted potential

prey (as indicated by its locking its gaze on one spot on the ground), it often continues soaring past until well beyond the intended victim, often beyond some cover, at which point it stoops back at an acute angle in a surprise attack (Snyder and Glinski 1988; SHS).

#### *Predation and Interspecific Interactions*

In New Mexico, we and others (see Johnson et al. 2000) have found Zone-tailed Hawks sharing their nesting habitats with a variety of other raptors, including Cooper's Hawk, Northern Goshawk (*Accipiter gentilis*), Red-

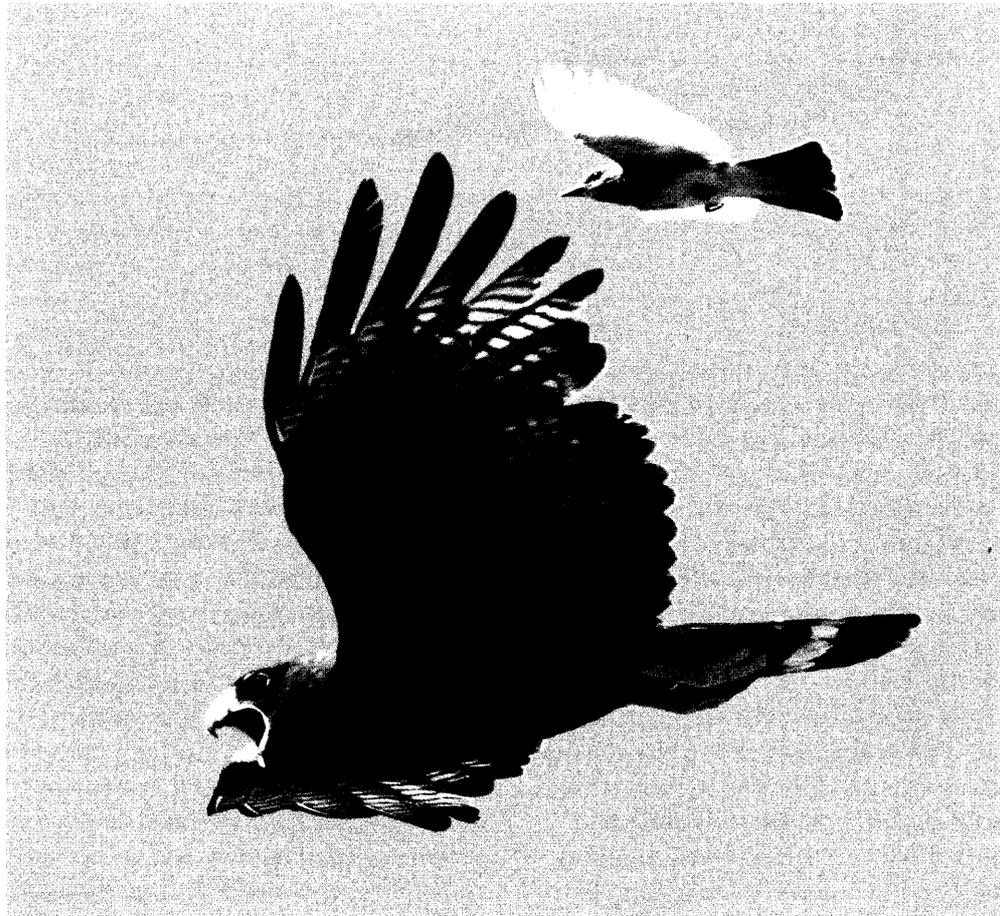


PHOTO 17.15

Zone-tailed Hawk being harassed by a Western Kingbird (*Tyrannus verticalis*), Bitter Creek, Grant Co., 23 June 2007.

PHOTOGRAPH: © ROBERT SHANTZ.

tailed Hawk, Swainson's Hawk (*Buteo swainsoni*), Common Black-Hawk, American Kestrel (*Falco sparverius*), Peregrine Falcon (*F. peregrinus*), Barn Owl (*Tyto alba*), Western Screech-Owl (*Megascops kennicottii*), Flammulated Owl (*Otus flammeolus*), and Great Horned Owl (*Bubo virginianus*). And yet, other than one Zone-tailed Hawk being chased by an American Kestrel in Grant County (Zimmerman 1976), we are not aware of any report of agonistic interactions with other raptors in the state. Elsewhere, Zone-tailed Hawks have been reported to aggressively defend nest sites from other raptors, ranging in size from Kestrels and Cooper's Hawks to Red-tailed Hawks and Golden Eagles (*Aquila chrysaetos*) (Johnson et al. 2000). A transient Zone-tail attacked an adult Bald Eagle (*Haliaeetus leucocephalus*) carrying a fish on the Verde River in Arizona, but was outmaneuvered by the eagle (Johnson et al. 2000). Miller (1952) reported evidence that nearly fledged young from an Arizona nest were taken by a Great Horned Owl. Apparently no other predation on Zone-tails has ever been documented.

Schnell (1994) noted that Common Black-Hawks occasionally nest in unoccupied Zone-tailed Hawk nests. We found the two species breeding sympatrically in the riparian forest along the Gila River in Grant County (chapter 12), with nests of Zone-tails and Black-Hawks as close as 39 m (128 ft) from each other (GS, unpubl. data). Yet in six years of intensive field work, we never observed any interactions between the two species. While Common Black-Hawks foraged along the river, Zone-tailed Hawks foraged away from the river and in the surrounding uplands. Thus the prey bases of the two species likely showed little overlap, with no severe competition for prey (Zimmerman 1970).

Among the Zone-tailed Hawk nests we monitored in the Gila River Valley, one was unusual, being situated in the midst of a large (25+ pairs) rookery of Great Blue Herons (*Ardea herodias*) in a mature cottonwood grove, apparently in a state of mutual tolerance between the two species. Matteson and others in Texas (see Johnson et al. 2000) also suggest a possible commensal relationship between Zone-tailed Hawks and both the Black-chinned Hummingbird (*Archilochus alexandri*) and the Broad-tailed Hummingbird (*Selasphorus platycercus*). These two hummingbirds are found to regularly visit Zone-tailed Hawk nests to forage for insects around prey remains.

## Status and Management

Zone-tailed Hawks occur at notably low densities. Kennedy et al. (1995) reported an apparent density of 1.51 pairs per 100 km<sup>2</sup> (39 mi<sup>2</sup>) in ponderosa pine forests of northern New Mexico, compared with estimates of 2.6 pairs per 100 km<sup>2</sup> in the Davis Mountains of Texas (Johnson et al. 2000) and 0.2 pairs per 100 km<sup>2</sup> in west-central Arizona (Millsap 1981). The minimum distance between active nests in northern New Mexico was 3.6 km (2.2 mi). In the Gila riparian corridor of Grant County, we found active nests within 2.5 km (1.5 mi) of each other (GS and SHS, unpubl. data). Smaller inter-nest distances have been reported elsewhere: 1.1 km (0.7 mi) in west Texas, and as little as 300 m (980 ft) in a western Arizona riparian area (Johnson et al. 2000). These small inter-nest distances probably result from a limited area of appropriate nesting habitat being concentrated in linear riparian systems coupled with presumably high prey availability in the vicinity.

Snyder (1998) suggested that perhaps a dozen pairs may nest in New Mexico. However, even without conducting comprehensive searches we knew of at least five distinct pairs in the portion of the Gila River Basin from the Burro Mountains east to the upper end of the Cliff-Gila Valley and south to Mangas Springs—an area of <50 km (~30 mi) of river valley representing just a small fraction of the primary breeding range within the southwestern corner of the state. Robert Shantz's photographs, illustrating this chapter, show that additional nesting occurs regularly in side canyons farther downstream, near the Arizona state line (see photos). In 1992, at least three active nests were reported from the Peloncillo Mountains and one active nest from the Animas Mountains (Williams 1992). Also in 1992, Kennedy et al. (1995) found five occupied nests (in eight territories) in the Jemez Mountains and on the adjacent Pajarito Plateau. With more breeding pairs from other locations, such as the Capitan, Sacramento, and Guadalupe mountains, there may be significantly more than a dozen breeding pairs in New Mexico. However, until comprehensive surveys are conducted throughout the state, the true number of Zone-tailed Hawks within New Mexico will remain a matter of speculation. Unfortunately, the Zone-tail's very low population density, cryptic appearance, large home range, and affinity

for remote, often rugged areas make it an exceptionally difficult species to census accurately.

The maximum potential reproductive rate of the Zone-tailed Hawk is rather limited by small brood sizes (even for a large raptor) and by having a single brood per season. Birds at the northern limit of their range in north-central New Mexico were further constrained by rather poor nest success: only a third of active territories successfully produced any young, for a meager productivity rate of 0.45 fledglings per occupied territory (Kennedy et al. 1995). In contrast, four of five nests found further south in Hidalgo County in 1992 were successful, although the actual productivity rate is unknown (Williams 1992). Matteson and Riley (1981) reported 0.78 and 1.14 fledglings per pair in two consecutive years in a Texas study. A sample of 22 nests in central Arizona averaged 1.85 fledglings per nest (Millsap 1981). Average productivity in New Mexico and whether it is enough to sustain the current population in the state remain unknown.

The Zone-tailed Hawk is listed in Texas as a Threatened Species (Johnson et al. 2000), and considered a Sensitive Species within U.S. Forest Service Region 3. Otherwise it has no special status. It has a Heritage ranking of S<sub>3</sub> in New Mexico (rare or uncommon within the state); in Arizona it ranks S<sub>4</sub> (fairly common). Zone-tails are considered “apparently secure” globally (G<sub>4</sub>). The Zone-tail occurs at such low densities, usually in remote areas, that it is relatively unaffected by human activities. Further, it appears to tolerate low levels of human disturbance around nest sites. For those reasons, Snyder and Glinski (1988) suggest that of the three border specialist raptors (Zone-tailed Hawk, Common Black-Hawk, and Gray Hawk [*Buteo nitidus*]), the Zone-tail may be the least vulnerable to extirpation within the United States. The riparian woodlands favored by these three hawks constitute one of the most endangered habitats in North America (Cartron et al. 2000); however, many of the montane areas where the Zone-tail also

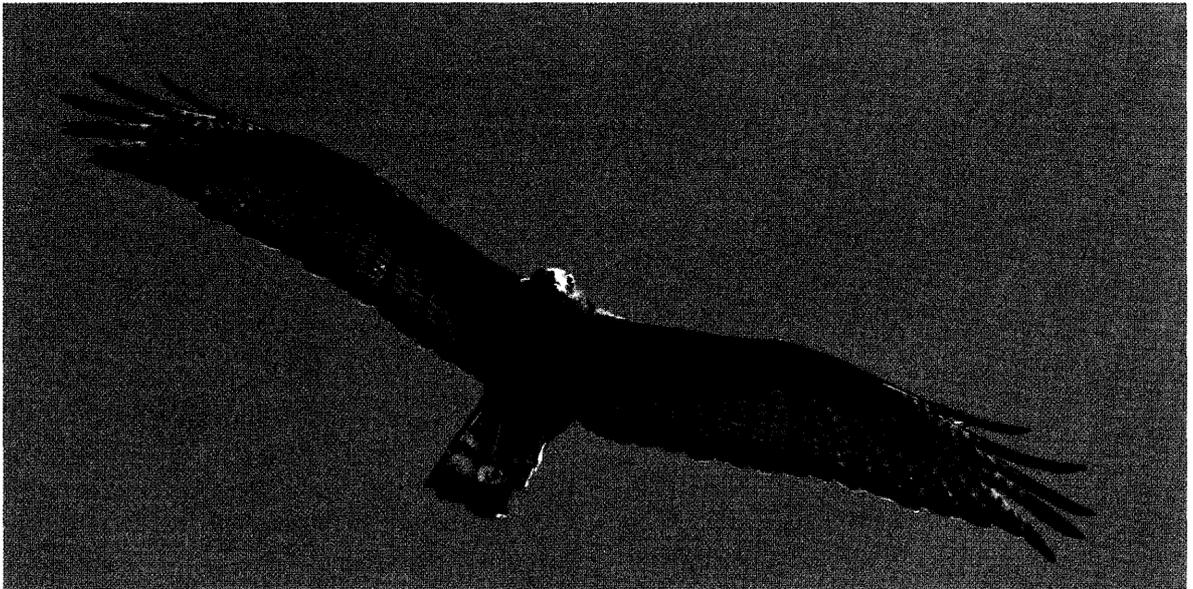


PHOTO 17.16

Zone-tailed Hawk released by Gila Wildlife Rescue, 25 November 2007. This bird was found emaciated near Cliff, Grant Co., and initially had to receive stomach tube feedings until it became stronger. Preparation for the release involved exercise in a flight cage.

PHOTOGRAPH: © DENNIS MILLER.

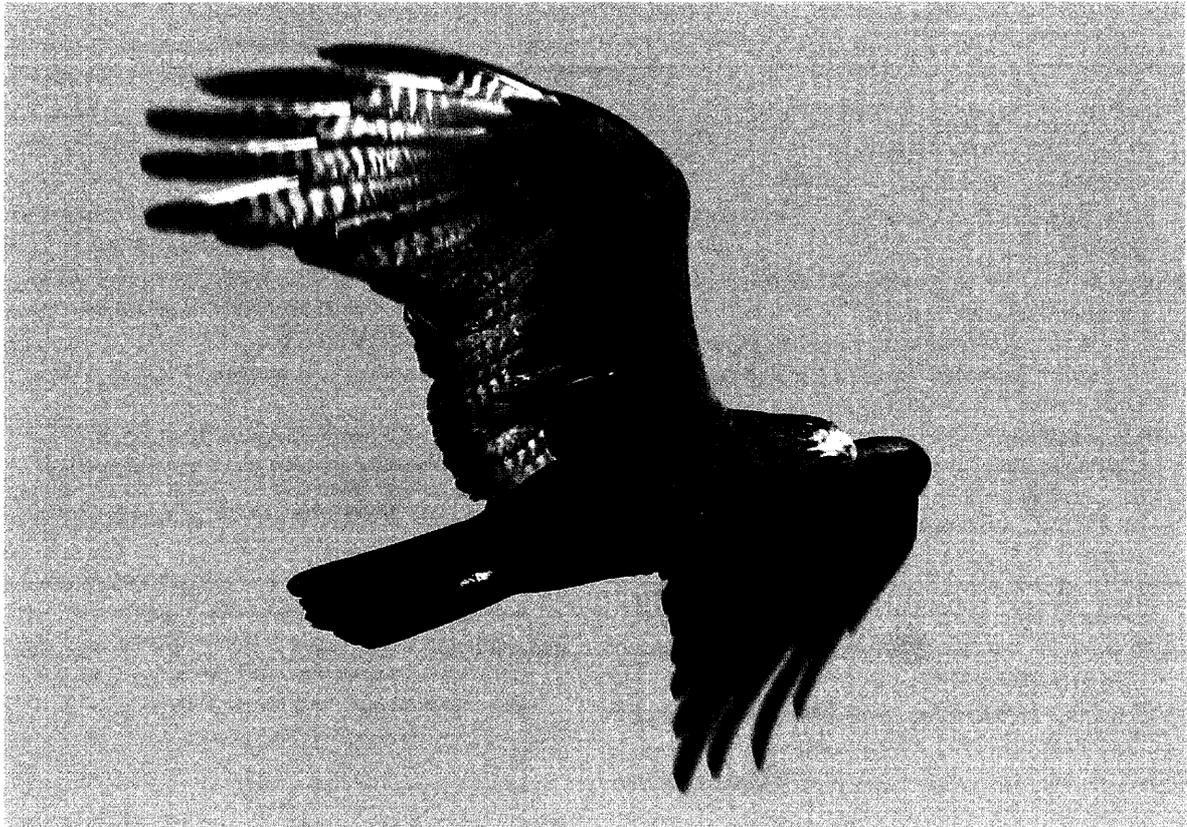


PHOTO 17.17

Zone-tailed Hawk in Steeple Rock Canyon, Hidalgo Co., 10 May 2003. The New Mexico Zone-tailed Hawk population is small, though population numbers are difficult to estimate.

PHOTOGRAPH: © ROBERT SHANTZ.

occurs are within National Forest or National Park Service lands, and thus protected from development and intensive human activity. The primary threat within the United States is probably illegal shooting; we know little about threats on the species' wintering grounds.

The Zone-tailed Hawk population in New Mexico may consist of substantially more than 12 pairs, but it is nonetheless small. Given also that observed productivity seems low in at least parts of the distribution in New Mexico, the species must be considered at risk in the state. Ensuring that this unique raptor remains a part of New Mexico's avifauna may require proactive management, including identification of the most productive territories for special protection. First and

foremost, however, a thorough census of existing and recent Zone-tailed Hawk territories is needed in New Mexico to provide a baseline for monitoring the species into the future.

### Acknowledgements

Suggestions and comments by J.-L. Cartron and R. R. Johnson greatly improved the first draft of this chapter. The authors' field work was conducted under the auspices of the U.S. Forest Service's Rocky Mountain Research Station, and funded by the Gila National Forest, Phelps-Dodge Corporation, and the National Fish and Wildlife Foundation.

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