

Foraging sites of Turkey Vultures *Cathartes aura* and Common Ravens *Corvus corax* in central Mexico

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Turkey Vultures *Cathartes aura* are probably the most abundant avian scavengers in semi-arid shrublands and woodlands in central Mexico, about two times more frequently seen than the next most common scavenger, Common Raven *Corvus corax*. The questions arise of what sustains this large number of scavenging birds, and whether road-killed animals along highways and secondary roads provide a reliable source of food.

In autumn 2005, from 5 to 10 November, we counted Turkey Vultures and other raptors along roads west from San Luis Potosí to Salinas, and north and west to Matehuala and San Cristóbal, and along the Guadalupe Mts, a total distance of about 600 km. We recorded whether Turkey Vultures were flying (circling) over rangelands or roads, and whether the birds were solitary or in groups. Turkey Vultures use carrion dispersed in space and time (Coleman & Fraser 1987) and thus cover large areas in their daily search for food. We assumed that birds flying slowly along roads or circling over roads, and flying slowly or circling over rangelands were foraging. Each observation was considered a single data point, regardless of the number of birds in the group. We also recorded any other raptors, including Common Ravens,

that were apparently associated with roads, and we recorded any animals killed on the roads.

We counted a total of 127 Turkey Vultures in 84 groups ranging from one to 11 birds in a group (Table 1). Most (75) birds appeared to be solitary. Of the total number of groups, 31 were circling over roads, or within about 50 m of the road, and 53 groups were circling over rangelands (Table 2), mostly far from roads. All birds associated with roads were singles or groups of two. The largest groups, of 6 to 11 birds, were all circling over small areas of rangeland, suggesting that they were congregating in the air over carcasses and had yet to descend to feed. No observations of Turkey Vultures actually feeding were made. Common Ravens were much less frequently seen in flight than Turkey Vultures, but larger numbers were actually seen, due to a single midday roost of at least 200 birds near Punteros.

Road-killed animals were surprisingly scarce, and only one Kit Fox *Vulpes macrotis*, a single Rock Squirrel *Spermophilus [Citellus] variegatus*, and three domestic dogs (all slightly larger than a Coyote *Canis latrans*) were seen. The only bird seen at a road kill was a Great-tailed Grackle *Quiscalus mexicanus* feeding on the Rock Squirrel carcass.

Table 1. Group sizes of Turkey Vultures occurring during road counts in central Mexico from 5 to 10 November 2005.

	No. of birds in group					
	1	2	3	4	5	>6
No. observations	75	4	1	0	0	4

Table 2. Observations of Turkey Vultures and Common Ravens in central Mexico.

Species	Over roads	Over rangelands
Turkey Vulture	31	53
Common Raven	15	22

Other raptors seen, not necessarily associated with roads, were Black Vultures *Coragyps atratus* (a group of 24, all in direct flight over rangeland), White-tailed Kite *Elanus leucurus* (1, perched on roadside pole), Red-tailed Hawk *Buteo jamaicensis* (4, circling over rangeland), Swainson's Hawk *B. swainsoni* (1, circling over rangeland), Harris' Hawk *Parabuteo unicinctus* (15, group sizes 2–4, all perched in open woodland), Crested Caracara *Polyborus plancus* (3, of which one was perched on a roadside pole, and two flying along the road) and American Kestrel *Falco sparverius* (1, perched on a roadside pole). We counted relatively few Black Vultures compared to numbers of Turkey Vultures. Road count censuses of the two species along roads in Los Mochis, in northern Mexico, showed similar densities to the birds in the San Luis Potosí area, but

not in the Gómez Palacios and La Michilia areas, where Turkey Vultures dominated (Hiraldo *et al.* 1991). Counts along roads in western Mexico similarly showed Turkey Vultures to be the commonest raptor, with the exception of southwestern Mexico, where Black Vultures were more common (Marin & Schmitt 1996).

In northern Mexico, Turkey Vultures selected small prey items in a cultivated area and carcasses of ungulates in desert and mountain areas, and apparently did not use road kills (Hiraldo *et al.* 1991). However, the high numbers of Turkey Vultures counted along roads (Hiraldo *et al.* 1991), suggests an association with roads in that region. The association of Turkey Vultures and Common Ravens with roads is widespread elsewhere in North America. There are records of Turkey Vultures having been killed on roads

in the USA in the 1930s (Sprunt 1937) implying that they may forage on certain types of roads. Home ranges of Turkey Vultures had proportionately more roads than woodland in southern Pennsylvania and northern Maryland (Coleman & Fraser 1989), suggesting that roads were an important part of their habitat. In the eastern Mojave Desert in California, both Turkey Vultures and Common Ravens were often observed soaring or perching near highways, and numbers of Common Ravens increased with increasing number of roads (Knight *et al.* 1999). Road-killed animals are a source of food for both Black and Turkey Vultures on the

Savannah River, South Carolina (DeVault *et al.* 2004) but it seems that utilising this source of food is geographically variable, and is infrequent in northern and central Mexico. Although proportionately more Common Ravens than Turkey Vultures were associated with roads in the San Luis Potosí area (Table 2), the difference is not significant. We suspect that roads and road-killed animals in the San Luis Potosí district are unimportant, in general, in the foraging economy of raptors, and do not offer a reliable source of food for the two most common scavengers, Turkey Vultures and Common Ravens in particular.

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