

## PREDATION BY FERAL CATS ON BIRDS AT ISLA SOCORRO, MEXICO

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Socorro Island, the largest and biologically most diverse of the four islands of the Revillagigedo Archipelago (Brattstrom 1990), confronts serious problems related to human activities. Eight endemic taxa of land birds now breed on Socorro: Yellow-crowned Night Heron, *Nyctanassa violacea graviorstris*; Socorro Red-tailed Hawk, *Buteo jamaicensis socorroensis*; Socorro Ground Dove, *Columbina passerina socorroensis*; Green Parakeet, *Aratinga holochlora brevipes*; Socorro Wren, *Thryomanes sissonii*; Socorro Mockingbird, *Mimodes graysoni*; Tropical Parula Warbler, *Parula pitiayumi graysoni*; and Socorro Towhee, *Pipilo erythrophthalmus socorroensis* (McLellan 1926, Jehl and Parkes 1982, Brattstrom 1990). Jehl and Parkes (1983) have proposed that domestic cats (*Felis catus*), introduced since 1957, are responsible for the extirpation of the endemic Socorro Dove, *Zenaida graysoni*, and reductions of other species, especially the Socorro Mockingbird. However, no quantitative data on predation by feral cats on Socorro Island have been previously reported in the literature. We present here an analysis of the diet of feral cats on Socorro Island.

Socorro Island, located approximately 450 km south of the tip of the peninsula of Baja California, covers about 14,000 hectares (16 × 11 km). This island is a volcanic cone whose highest point is Mount Evermann (1050 m). Climate is arid tropical with an average annual temperature of 24.8° C and average annual precipitation of 327.7 mm. Fresh water is found in the puddles formed after tropical storms and continuously in several caves.

From 16 to 28 February and from 7 to 12 May 1990 we conducted our field research on Socorro Island, intensively searching for scats, tracks, and other indirect evidence of feral cats, specially in the south portion of the island. We searched in *Croton* scrub (40 m elevation), disturbed grassland, and forest (650 m elevation). Presumably, the scats we found were from different individuals, as they were widely dispersed.

We found and analyzed 31 scats, comparing the remains of scales, bones, feathers, and hairs with those of the collection of Centro de Investigaciones Biológicas. Table 1 shows the occurrence of items in 31 scats found during February and May 1990. Feral cats were feeding mainly on House Mice (*Mus musculus*), endemic lizards (*Urosaurus auriculatus*), some birds, and also crabs, insects, scorpions, and various vegetable materials (Table 1). Birds were present in 22.6% of the cat scats (February and May samples combined). The Socorro Ground Dove and Tropical Parula Warbler were the two bird species found most often in the scats, five and three times, respectively. A recent colonizer, the Mourning Dove (*Zenaida macroura*), was present in two of the 31 analyzed scats. Although we did not find remains of another recent colonizer, the Northern Mockingbird (*Mimus polyglottus*), in May we found feathers of one in the field, presumably eaten by a feral cat. Jehl and Parkes (1982) reported predation by cats on Townsend's Shearwater (*Puffinus auricularis*), but we did not find evidence of this perhaps because our searches were not made near the shearwater colonies.

Our results suggest that predation on birds by feral cats is not very important. However, even limited predation may seriously affect a species as endangered as the Socorro Mockingbird. This species' population may be approximately 60–70 pairs (Castellanos and Rodriguez-Estrella 1990, L. Baptista pers. comm.), and we found evidence that it is preyed upon by Socorro Red-tailed Hawks (a Socorro Mockingbird

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**Table 1** Prey Remains Identified in 31 Scats of Feral Cats on Socorro Island, 1990

Prey	February (12 samples)		May (19 samples)	
	N <sup>a</sup>	%	N	%
Mammals	11	91.7	17	89.5
<i>Mus musculus</i>	9	75.0	17	89.5
<i>Felis catus</i>	2	16.7	0	0.0
Birds	3	25.0	4	21.1
<i>Columbina</i>	2	16.7	3	15.8
<i>Thryomanes</i>	1	8.3	1	5.3
<i>Parula</i>	2	16.7	1	5.3
<i>Mimodes</i>	1	8.3	0	0.0
<i>Zenaida macroura</i>	0	0.0	2	10.5
Reptiles	4	33.3	10	52.6
<i>Urosaurus auriculatus</i>	4	33.3	10	52.6
Invertebrates	9	75.0	14	73.7
Orthoptera	8	66.7	12	63.2
Lepidoptera	2	16.7	0	0.0
Coleoptera	2	16.7	4	21.1
Hymenoptera	1	8.3	1	5.3
Scorpiones	0	0.0	4	21.1
Decapoda	0	0.0	2	10.5
Miscellaneous	9	75.0	17	89.5
Seeds	1	8.3	4	21.1
Vegetable fibers	8	66.7	14	73.7
Unidentified animal matter	0	0.0	2	10.5

<sup>a</sup>Number of scats in which each species or item was identified.

wing and feathers showing predation by a hawk) and cats. The endemic Red-tailed Hawk and Socorro Mockingbird have presumably long been in predatory-prey equilibrium, while cats are of recent introduction. "Alien predation" (Moors and Atkinson 1984) by cats may be a serious problem because it could lead to declines in some bird species, as has happened with other island landbirds and seabirds (Jehl 1972, Taylor 1979, Diamond 1982, Moors and Atkinson 1984, Fitzgerald and Veitch 1985, Veitch 1985, Ebenhard 1988).

The population of feral cats seems to be densest in the southeast portion of the island apparently because this area is the zone most perturbed by human activities. Here water and domestic garbage are available for cats, and the food supply in human refuse may favor an increase of the cats' population. The actual numbers of cats is hard to determine, although their distribution on the island is increasing (Arnaud et al. unpubl. data). Because feral cats take their prey mainly on the ground, birds foraging on the ground, such as the endemic ground dove and wren, are especially vulnerable. The Socorro Wren population is very dense, but such is not the case for Socorro Ground Dove, which is still fairly common in the open lowlands of the island, especially in the southeast and eastern portions near the coast (W. Wehtje pers. comm.). This species is no longer as tame as reported by Villa (1960)—"son mansas y se les captura simplemente con las manos"—but it seems that their foraging and reproductive activities are normal. However, whenever we approached

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the ground doves, they immediately flew, suggesting that predation by cats is affecting the endemic dove's tameness and possibly its population size.

At the Centro de Investigaciones Biológicas we are studying the process of apparent extinction of some bird species, and we want to call the attention of the scientific community and organizations concerned with the conservation of biodiversity about the need to eradicate the feral cats from Socorro Island and thereby protect the endemic avifauna. Otherwise, cats may put in risk some of the land birds of the island, particularly the Socorro Mockingbird.

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