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CURRENT STATUS OF THE SOCORRO MOCKINGBIRD

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ABSTRACT.—The Socorro Mockingbird (*Mimodes graysoni*), and endangered endemic species, was the most widely distributed bird on Isla Socorro until 1978 when it was found to be declining. Predation by feral cats, introduced in the island about 1957, was thought to be the principal cause related to its decline. Although the Socorro Mockingbird was considered on the verge of extinction, in 1988–1990 we found a larger and more widely distributed population of the species in the island. We estimated that 50–60 pairs were present. *Received 24 March 1992, accepted 11 Sept. 1992.*

The Socorro Mockingbird (*Mimodes graysoni*), and endangered endemic species, was once the most abundant and widely distributed bird on Isla Socorro (McLellan 1926; Jehl and Parkes 1982, 1983). This condition apparently prevailed until at least 1958 (Grayson 1870–71, Anthony 1898, McLellan 1926, Hanna 1926, Brattstrom and Howell 1956, Villa 1960). By 1978 a dramatic change was noted. Jehl and Parkes (1982, 1983) found only two to nine Socorro Mockingbirds which were confined to patches of coastal fig trees, and they considered the species "on the verge of extinction." Furthermore, Jehl (1984) considered the species as endangered with scant possibility for recuperation. Jehl and Parkes (1982) discussed the role of the predation by feral cats on *Mimodes* but concluded that habitat destruction by sheep and potential competition with the Northern Mockingbird (*Mimus polyglottos*), a recent colonizer of Isla Socorro, had not affected Socorro Mockingbird abundance. In 1988–1990, we found a larger and more widely distributed population of Socorro Mockingbirds than reported in 1978 to 1981 by Jehl and Parkes (1982). We present our findings on the Socorro Mockingbird's status and some ecological notes on the species obtained during our visits to Isla Socorro, Mexico.

STUDY SITE AND METHODS

Isla Socorro lies approximately 450 km SSW of the tip of Baja California peninsula, Mexico (18°47′N, 110°57′W). It has an area of about 159 km^2 and is the largest of the four islands forming the Revillagigedo archipelago. Descriptions of the island can be found in Miranda (1960), Levin and Moran (1989) and Santaella and Sada (1991).

We explored the southern half of the island and some portions of the northwest and west sides (Fig. 1) in April (16–18), May (24–31), September (28–30), November (15–17) and December (14–17), 1988, and in February (16–28), May (7–12) and November (18–25), 1990. The population of the species was estimated by intensively searching for each Socorro Mockingbird. We walked through canyons, mixed scrub and forests where the *Mimodes*

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TABLE 1
STRUCTURAL FEATURES OF THE FOREST WHERE SOCORRO MOCKINGBIRDS WERE FOUND

Species	Mean height (m)	Crown cover (m^2/ha)	Crown cover (%)	Abundance	Density (%)
Bumelia socorrensis	8.75	4478.6	24.99	6	11.54
Guettarda insularis	6.28	2073.4	11.57	9	17.31
Ilex socorroensis	5.81	4754.2	26.53	8	15.38
Psidium socorrensis	6.06	5980.3	33.37	26	50.00
Zanthoxylum insulare	5.00	143.3	0.8	1	1.92
Unknown	5.00	492.9	2.75	20	3.85

could be present. In addition, a group from the California Academy of Sciences and UCLA used *Mimodes* vocalizations in several parts of the island to attract the species (L. Baptista, pers. comm.). We plotted all observations on quadrangle maps of the island.

We measured the vegetation structure of the area where Socorro Mockingbirds (N = 15) were observed most frequently foraging and displaying territorial behavior. The plot was located on the south slope of the Mount Evermann in a forest habitat at 600 m elevation. Only individuals taller than 0.5 m were registered for each plant species. Crown cover, density of the main plant species, heights of the trees, phenology and soil exposure were calculated on the 1000 m^2 sampled area. Size of the area was calculated by the Minimal Sample Area method (Mueller-Dombois and Ellenberg 1974).

RESULTS AND DISCUSSION

We observed between 20 and 25 Socorro Mockingbirds in February of 1990 and about 34 in November 1990. Considering that the northern part of the island has not been explored we believe a greater number of endemic mockingbirds inhabit the island today. We estimated conservatively a population of 50–60 pairs of *Mimodes* for the whole island. Most of the birds we detected were in the forest and mixed scrub vegetation between 300 and 750 m (N = 52), but some birds were registered at lower and higher altitudes (60–800 m elevation; N = 7); Webb and Howell (pers. comm.) observed two pairs in February 1988 in a chaparral-like scrub about 900–950 m elevation (Fig. 1). Structure of the forest where Socorro Mockingbirds were frequently recorded indicates that *Mimodes* inhabits mostly forest with trees 6–9 m tall, dominated by *Bumelia socorrensis* and *Psidium socorrensis* with *Guettarda insularis* and *Ilex socorroensis* as other important species (Table 1).

Mimodes was especially abundant in some small canyons, such as one located about 600 m elevation, 2.5 km west of the airstrip on the south slope of Mount Evermann, where we found up to 13 birds in about 5 ha. In November 1990, we identified 10 territories of *Mimodes* in this canyon, which we marked using colored flags. Pairs were interspaced by 60.2 ± 14.6 m (range 40–80 m). In contrast, we found isolated individuals in the

lowlands of the island where overgrazing by sheep is prevalent. A strong territoriality was observed in February and we suspect the Socorro Mockingbirds were nesting, because they were singing and carrying food in their bills. We failed, however, to locate any nests of *Mimodes.* Food included land crab remains, *Ilex, Bumelia* and *Cordia* fruits and small invertebrates, such as hemipterans and homopterans gleaned from the leaves, trunk and litter. On one occasion *Mimodes* was observed eating eggshell debris. The most commonly eaten fruit was that of *Bumelia.* Anthony (1898) reported a Socorro Mockingbird stomach containing lizard (*Urosaurus auriculatus*) remains. We saw no predation upon any bird species.

Jehl and Parkes (1982, 1983) consider that the *Mimodes* decline began in 1958, as a consequence of predation by feral cats introduced to the island in 1957. However, although Jehl and Parkes (1983) reported that feral cats could be found over most of the island, at the present time (1988–1990) the few sightings of cats and cat signs, most of them recorded near human settlements, seem to indicate a low density and a restricted distribution on the island (Veitch 1989; Arnaud, Alvarez and Castellanos, unpubl. data). Feral cat predation may have played a role in Socorro Mockingbird abundance, but we believe that other factors were also important. We suggest that one of the principal causes of *Mimodes* decline was the tremendous habitat disturbance induced by sheep overgrazing the island. This disturbance has lead to erosion and to a lack of vegetation in some areas, i.e., the *Psidium* forest has almost vanished in the lowlands since 1958 (see Miranda 1960). Almost one third of the island is now impacted by sheep overgrazing (Fig. 1); we did not find any Socorro Mockingbird in these areas. In contrast we found several *Mimodes* in the forests where the impact of sheep was low or moderate. In addition, the potential role of competition between *Mimodes* and the Northern Mockingbird should be considered. The latter apparently became established on Isla Socorro since 1978 (Jehl and Parkes 1982). At the present *Mimus* is very common and abundant elsewhere in the areas we explored on the island. In almost all sites where we observed *Mimodes,* the Northern Mockingbird was also present.

The habitat condition of the island has not improved between 1978–1990, and rather the habitat degradation has increased in some areas. In this situation the *Mimodes* population could hardly have been increased in numbers in this period. The low numbers of *Mimodes* found by Jehl and Parkes (1982, 1983) probably were a mistake because they spent few days in the field and surveyed a restricted area of the island.

Although the Socorro Mockingbird is not on the verge of extinction, the species is still endangered, because of the spread of erosion on the island caused by sheep overgrazing and the persistence of the feral cat

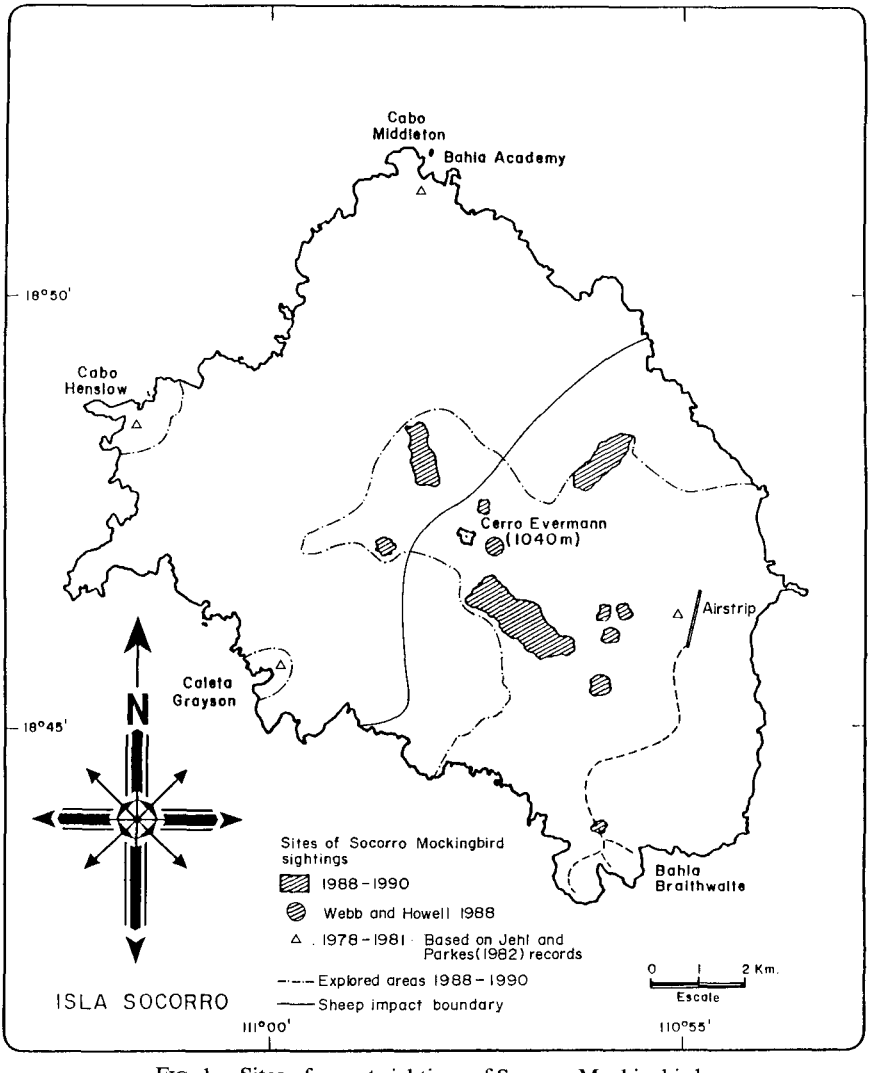

FIG. 1. Sites of recent sightings of Socorro Mockingbirds.

population. Our census revealed that Socorro Mockingbirds are common in certain areas that warrant immediate and effective protection; sheep and feral cats must be eliminated or controlled. Finally, a study of the relationships and interactions between *Mimodes* and *Mimus* should be conducted in order to understand the ecological relationships between the two.

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