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APÉNDICE E  
CENSO DEL GUABAIRO

**PRELIMINARY  
POPULATION ASSESSMENT PUERTO RICAN NIGHTJAR  
(CAPRIMULGUS NOCTITHERUS)  
AT THE LAS PARDAS SITE  
GUANICA, PUERTO RICO**

Prepared for  
**PR Land Administration**  
**San Juan, Puerto Rico**

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## INTRODUCTION

On May 10, 2004 the Puerto Rico Land Administration retained professional services to conduct a Population Assessment to determine the presence and population levels, if any, of the Puerto Rican Nightjar (Caprimulgus noctitherus), a federally listed endangered species, at the Las Pargas site, in Guanica, Puerto Rico. **Figure 1** presents the approximate location of the study area. This report summarizes the project approach, field activities and findings of the project. General recommendations are also included in this report.

## PROJECT APPROACH

The purpose of the population assessment was to disclose available, factual population information, conduct preliminary surveys utilizing dawn and dusk surveys along established transect routes and broadcasting a taped PR nightjar song to entice call-back behavior from male individuals during surveys. Obtained information was utilized to render an opinion regarding the population data collected and reviewed.

The population assessment included a review of available information, a site visit to establish appropriate transect routes, and conducting dawn and dusk surveys along the transects. The PR nightjar was detected in the property during the population assessment study.

## STUDY AREA

The study area is a tract of land of undulating and hilly coastal secondary dry scrub forest approximately 200 acres in size. The delimited area was deemed as having potential of harboring individuals of the Puerto Rican Nightjar, based on existing habitat conditions and the close proximity of extant nightjar populations. The Property lies along the coast on the northern side of the Ensenada Las Pargas and is easily reached via a dirt road off route PR325 leading from the Guanica Ensenada borough to the Playa Santa sector in the municipality of Guanica in Southwestern Puerto Rico. A general landscape of the area is shown in **Figure 2**.

## FIELD ACTIVITIES

Fixed station counts were conducted along existing access roads and trails during five nights and six dawns beginning the dawn of May 15, 2004 and ending on the dawn of May 21, 2004 along established transect routes. A total of thirty-eight (38) stations were established along the unpaved power line access road traversing the northern portion of the property from west to east, beginning at the west end of the property, near route PR-325. These census stations were designated with a number preceded with the letter **E**. Forty stations were located on the southern portion of the property along the coast. These census stations were designated with a number preceded by the letter **A**. Sampling stations were located at 100 foot intervals and marked with flagging tape. Census stations designated with the letter **E** increased in designated number from West to East. Census stations designated with the letter **A** increased in designated number from East to West. Sampling station locations are illustrated in the 1995 aerial photograph shown on **Figure 3**, and in the **Figure 4** topographic map. At each station, one, or two observers listened for nightjar calls a minimum of 40 seconds before moving to the next station. At stations where no nightjars were initially heard, a recording of nightjar calls was played back during 20 seconds to entice extant nightjars

Las Pargas site

to call back. If a nightjar was detected calling at a given station, the shortest distance to the individual was estimated to the nearest 50 m. Dawn transects were conducted beginning at 0300 hours (hrs) and ending no later than 0630 hrs. Dusk transects began no earlier than 1830 and ended no later than 2140 hrs. Summarized results of the census station counts are shown on **Table 1**.

The vegetation in the study area may be described as secondary dry coastal scrub forest throughout the property. It consists of dense secondary shrubs and trees ranging to about 30 ft in height where the dominant trees are Bursera simarouba ("Almacigo"), Prosopis juliflora ("Aroma"), and the dildo cactus Cephalocereus sp.

Two transect routes were established in vegetated areas along trails or dirt roads within an approximately 200 acre plot reportedly slated for a tourist development. Existing regulations require assessing endangered wildlife, if any, and developing mitigation strategies or actions, if applicable. Transect length ranged from 1140- to about 1200-m to cover the length (east-west) of the property and to detect calling nightjars along the approximately 600 m North-South width. Sequentially numbered flagging tape markers were placed in stations located at approximately 30-m (100 ft) intervals along existing routes to aid in the location of individual nightjars in the field. Stations were georeferenced with a global positioning unit (GPS). The data thus collected were incorporated in a geographical information system (GIS) for presentation and analysis.

Transects were run at dawn and dusk; dawn counts were consistently lower than dusk counts. Thus, transects run at dusk were utilized in the count estimates, as the maximum number of nightjars heard on any given transect route represents the minimum number of nightjars in the study area. A detection distance of approximately 300 m (50 m increments) was used to estimate the perpendicular location of calling birds from the transect route. Birds were tallied as either orthogonally north or south of

the sampling station at the estimated distance. Distances were calibrated by practicing with birds located at known distances along the marked transect routes by walking away from an individual calling from a known location. Although there is an inherent error present in estimating distances, the conclusion on whether nightjars are present on the property, or their numbers should not be affected by this error. A total of 5 and 6 transect runs were conducted at dusk and dawn, respectively, in the two transect routes.

Three experienced observers (two in one route, one in the other) participated in the study, so that both established routes were censused simultaneously at dusk and dawn.

At dusk, onset of nightjar calling varied between 1830 and 1842 hrs. A minimum of 5 minutes were allowed to pass after the first call was heard before beginning walking slowly along the marked transects, listening for calling birds. Transect routes were run under varying cloud cover conditions. No transects were run under rain; one transect run under windy conditions returned zero nightjar calls (May 17). During transect runs, distance to each calling bird was estimated from a position as perpendicular as possible between the calling bird and the transect route.

## RESULTS

Based on field observations conducted during this study and considering that any nightjar calling at a distance of approximately 300 m or less could be heard at this site, the maximum number of eight male nightjars that were detected (8 male-female pairs) may be considered the minimum number of nightjars inhabiting the approximately 200 acre study area. As shown on **Tables 1** and **1A**, the lowest versus the highest dusk count varied by a factor of a little more than about two (2).

The maximum number of nightjars for this area was calculated utilizing the dusk counts of May 18 and 19 2004 (8 nightjars). Estimated breeding territories or home ranges of breeding pairs of PR nightjars are larger than of 4.8 hectares (ha) and range to about 5.6 ha (Villegla 1989). It should be noted (**Figure 5**) that three of the eight detected male nightjars were located outside the target habitat area (approx. 200 acres in size).

Thus, the five pairs of PR nightjars detected on the (target) subject property are utilizing approximately 40 acres/pair, suggesting that less than optimal habitat is available at the site, as compared to about 8.0 ha reported in the literature as utilized by nightjars at or higher than 75 m above MSL (Noble et al., 1986) Noble et al., (1986) estimated that nightjars were utilizing about 18.8 ha between 25 and 75m above MSL on the Guanica Forest. Findings of this study are comparable to the findings of Noble et al. for the range of habitats found in the Guanica Forest (1 ha ~ 2.5 acre).

Within the approximately 200 acre lot slated for establishment of a tourist facility the number of birds heard on any given night at a given transect route was also relatively variable as shown in **Tables 1** and **1A**. Nightjars called relatively constantly, and appeared to forage within the thick understory of the dense secondary vegetation. Birds were only rarely observed sallying to trees in open areas (i.e., near the open salina near the west end of the study area).

## CONCLUSIONS

Based on field observations and the transect data obtained during this study, the Puerto Rican nightjar is present in the study area. As expected, based on experience and published reports, the species is more abundant in areas located at or above 25 M above MSL. More detailed studies would be necessary to specifically determine whether the species breeds in the area.

Nevertheless, and based on the proposed use for the area, several preventive measures are in order to maintain the presence of the Puerto Rican Nightjar in the area. These include; (1) avoiding excessive use of lighting and/or directing lighting to specific areas rather than utilizing floodlights, (2) planting dense foliage tree rows along the northern boundary of the development to minimize lighting intrusion into the nightjar habitat; these trees may need to be provided with irrigation and fertilizers to promote their rapid growth (3) good housekeeping practices as pertain to refuse management and disposal to discourage vertebrate pests such as cats, dogs, and mongooses from being attracted to the area, (4) maintaining surface water availability to stray animals at a minimum, together with an effective vertebrate pest control program, and (5) minimizing forest fragmentation (by reducing roadbulding to a minimum, and locating housing units in a minimum number of clusters). (6) Starting construction outside the known breeding season that lasts between early April to late July to avoid interfering with nightjar reproduction. Such construction coordination may help nightjars adjust to avoid construction areas and possibly nest further north. (7) Coordinate most construction to occur below the 25m above MSL elevation line. Careful and observant implementation of these measures should be adequate for the protection of the nightjar population at site.

## LITERATURE CITED

- Noble, Robert E., J.F. Vilella, and P.J. Swank. 1986. Status of the endangered Puerto Rican Nightjar in 1985. *Carib. J. Sci.* 22(3-4):137-143
- Vilella, J.F. 1989. The reproductive ecology and population biology of the Puerto Rican Nightjar, *Caprimulgus noctitherus*, Ph.D. dissertation. Louisiana State University. 160 pp.

**TABLE 1**  
**POWER LINE ACCESS ROAD CENSUS COUNTS (E-LINE)**  
**PUERTO RICAN NIGHTJAR POPULATION ASSESSMENT**  
**LAS PARDAS SITE**  
**GUANICA, PUERTO RICO**

Date	Time begin	Time End	Male Birds heard	Weather
5/15/04	0300	0620	3	Cloudy
5/15/04	1830	2120	4	"
5/16/04	0300	0618	2	"
5/16/04	1842	2125	4	"
5/17/04	0300	0630	0	Cloudy, windy"
5/17/04	1835	2130	0	"
5/18/04	0302	0620	3	Cloudy
5/18/04	1832	2130	4	"
5/19/04	0300	0620	3	"
5/19/04	1840	2125	4	"
5/20/04	0305	0640	2	Lightly cloudy
5/20/04	1835	2130	4	"
5/21/04	0310	0645	2	Cloudy

Notes:

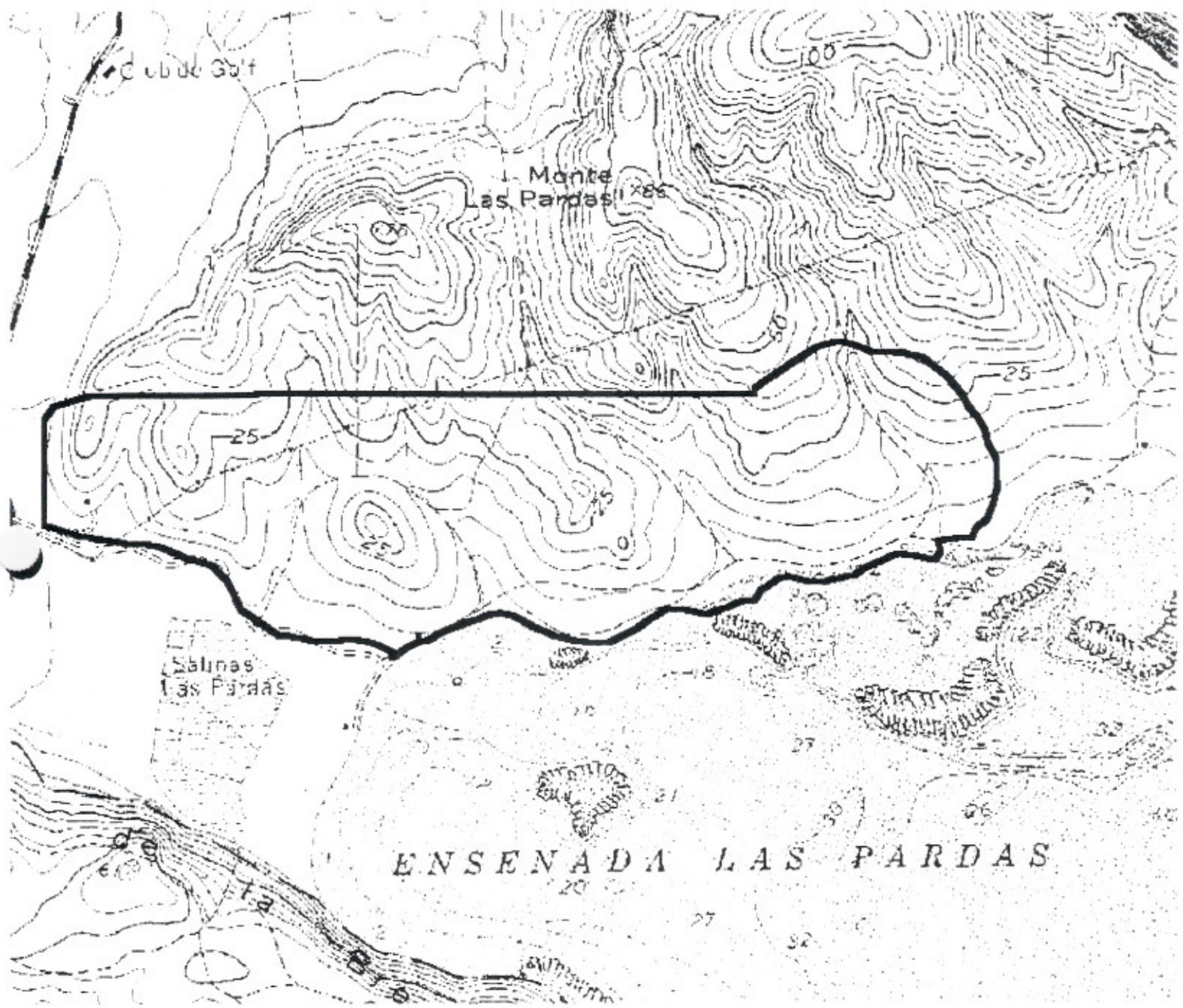
Censuses run on 5/17/04 returned zero (0) nightjar calls due to windy conditions.  
 Distance interval between sampling stations: Approximately 30 m (100 ft).  
 Length: Approximately 1.140 km.

**TABLE 1A**  
**SOUTHERN COASTAL TRAIL ACCESS ROAD CENSUS COUNTS (A-LINE)**  
**PUERTO RICAN NIGHTJAR POPULATION ASSESSMENT**  
**LAS PARDAS SITE**  
**GUANICA, PUERTO RICO**

Date	Time begin	Time End	Male Birds Heard	Weather
5/15/04	0302	0619	2	Cloudy
5/15/04	1828	2121	2	"
5/16/04	0305	0624	2	"
5/16/04	1840	2127	2	"
5/17/04	0305	0638	0	Cloudy, windy"
5/17/04	1832	2136	0	"
5/18/04	0300	0645	3	Cloudy
5/18/04	1835	2135	4	"
5/19/04	0300	0622	2	"
5/19/04	1842	2129	4	"
5/20/04	0300	0643	2	Lightly cloudy
5/20/04	1834	2135	4	"
5/21/04	0312	0649	1	Cloudy

Notes:

Censuses run on 5/17/04 returned zero (0) nightjar calls due to windy conditions.  
 Distance interval between sampling stations: Approximately 30 m (100 ft).  
 Length: Approximately 1.20 km.



**FIGURE 1**  
**SITE LOCATION MAP**  
**LAS PARDAS SITE PUERTO RICAN NIGHTJAR POPULATION ASSESSMENT**  
**GUANICA PUERTO RICO**  
(Guanica quadrangle, Approx. scale; 1:20,000)



FIGURE 2.  
GENERAL VIEW SHOWING HABITAT FEATURES DOMINATING THE LAS PARDAS SITE  
LANDSCAPE. NOTE THE SLOPING TERRAIN WITH DENSE SECONDARY FOREST GROWTH AND  
RELATIVELY LOW OVERSTORY.



FIGURE 3  
AERIAL PHOTOGRAPH SHOWING APPROXIMATE LOCATION OF TRANSECT  
COUNT SAMPLING STATIONS  
(Approx. scale 1:20,000)

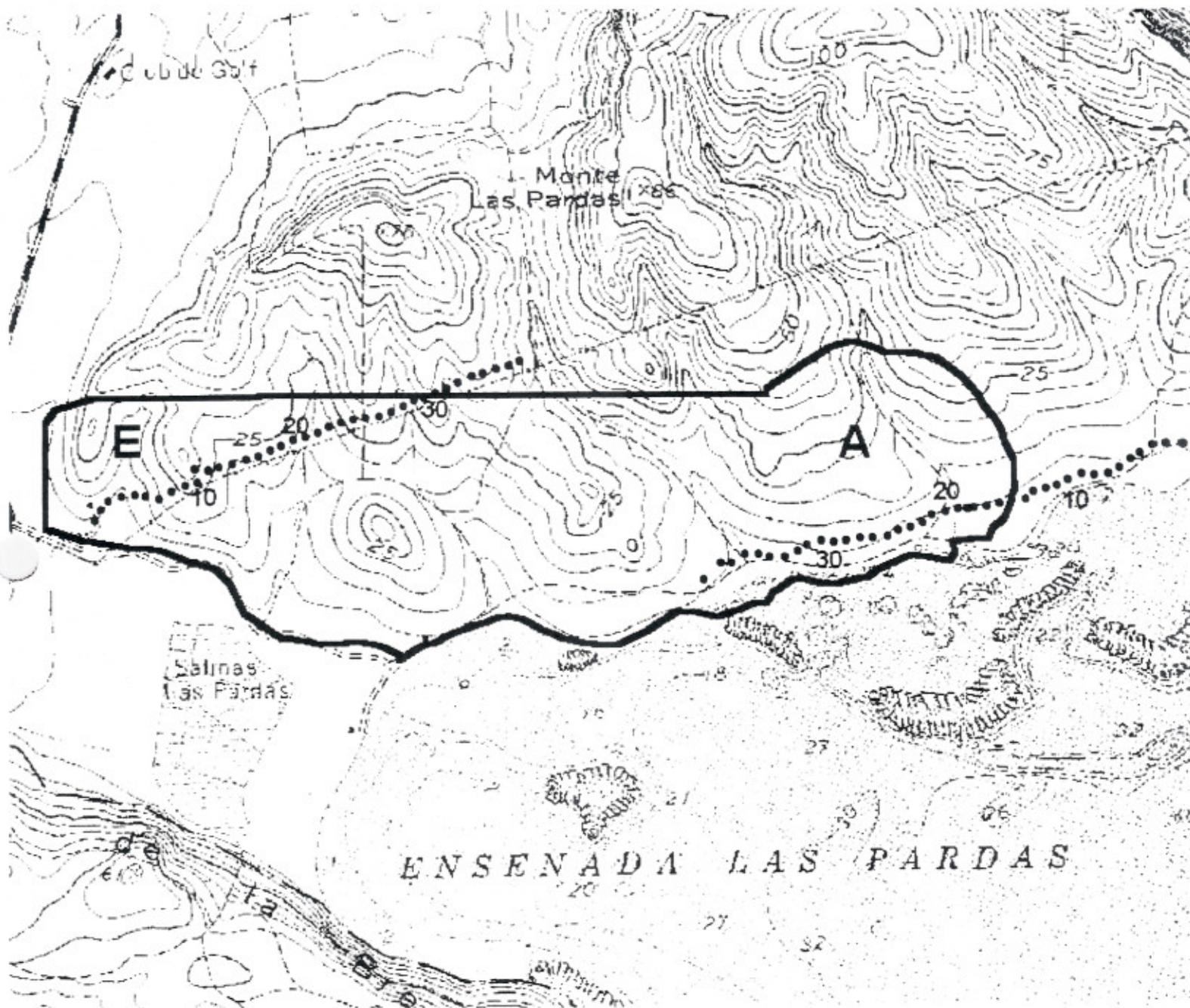


FIGURE 4  
TOPOGRAPHIC MAP SHOWING APPROXIMATE LOCATION OF TRANSECT  
COUNT SAMPLING STATIONS  
(Guanica Quadrangle, Approx. Scale 1:20,000)

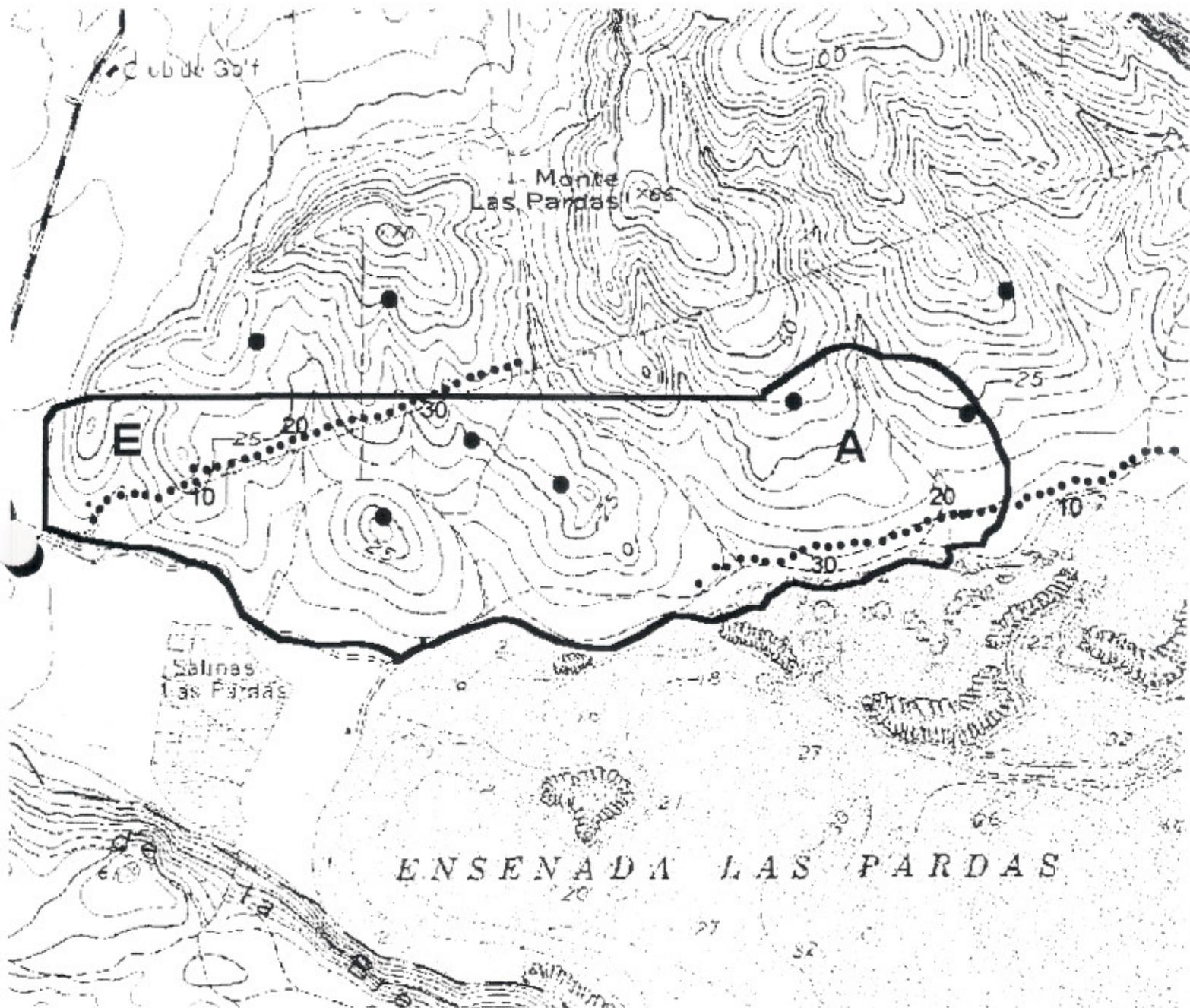


FIGURE 5  
 TOPOGRAPHIC MAP SHOWING APPROXIMATE LOCATION OF CALLING  
 NIGHTJAR MALES (BLUE DOTS); TRANSECT SAMPLING STATIONS SHOWN AS  
 REFERENCE

(Guanica Quadrangle, Approx. Scale 1:20,000)