

## NEST-SITE CHARACTERISTICS OF CRESTED CARACARAS IN LA PAMPA, ARGENTINA

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Crested Caracaras (*Caracara plancus*) range from the southern United States to southern South America and, although the natural history of North American populations has been described (Bent 1938, Brown and Amadon 1968, Morrison 1996), there has been little in-depth study of the species elsewhere. Nest characteristics for Crested Caracaras have been documented in Baja California (Rivera-Rodriguez and Rodriguez-Estrella 1998), Texas (Dickinson and Arnold 1996), Florida (Morrison 1996), and Argentine Patagonia (Travaini et al. 1994). Knowledge of the Argentine population is limited to Travaini et al. (1994) and several brief notes. In this paper, I describe characteristics of 17 Crested Caracara nests found during December 1998 and January 1999 in northern La Pampa, Argentina, and compare these characteristics with those observed in other populations.

### STUDY AREA

The landscape in the northern La Pampa panhandle (approximately 35°14'S, 63°57'W) is dominated by a mix of cattle ranching and row-crop agriculture. Common summer crops are alfalfa, sunflower, sorghum, and corn. Uncommon and isolated native mesquite (*Prosopis* spp.) trees and introduced Chinese elm (*Ulmus parvifolia*) are found along dirt and paved roads. Mesquite trees in fields have generally been removed for agriculture and few remain. Forested areas are generally groves of introduced eucalyptus (*Eucalyptus* spp.) trees, planted as shade areas for cattle, for wind breaks between fields, and as entrance corridors to estate houses. High winds and strong rains are common during the summer, particularly from the southeast. Annual rainfall is 828 mm, with 50% occurring from November through February. Summer temperatures range from 23–38°C.

### METHODS

Surveys for caracara nests were conducted by vehicle in December 1998 and January 1999. Surveys were conducted once, over approximately 420 km along a 2000 km<sup>2</sup> grid of public dirt and paved roads. Roads were buffered by 10 m of public land on each side, were fenced, and lay adjacent to private ranches. Private lands were not surveyed. All trees and shrubs along the roads were checked for caracara nests. Nests showing disrepair or no sign of occupancy during the breeding season were not

used in this analysis. For each occupied nest found (eggs, nestlings, fledglings, or adults at the nest), substrate height (base to the top of substrate), nest height (base to the egg level of the nest), and nest orientation (deviation from magnetic north grouped in 45° octants) were recorded. Nest and nest cup diameters were measured for five nests, two in mesquite and three in elm. Differences in nest heights between tree species were analyzed using a *t*-test. Nest orientation was examined using Rayleigh's test for circular uniformity (Zar 1996). All mean values are presented as mean ± standard error. A critical value of 0.05 was used for all analyses.

### RESULTS AND DISCUSSION

Seventeen caracara nests were found during road surveys. Thirteen nests were found in mesquite and four in elm. Nests were not found in other vegetation types. Nests were generally located in isolated trees and in the tallest vegetation in the immediate area. When nests were found in elms, no mesquite trees were in the vicinity. For two of the nests found in mesquite, a neighboring mesquite tree was located approximately 40 m away. Agricultural fields surrounded all nest trees. Nests were located more than 1 km from the nearest building, although buildings were not generally found near roads, but well inside private estate boundaries. Two nests were located 0.4 km apart.

The average height of the nest tree was 7.4 ± 0.4 m. Mesquite trees containing nests averaged 7.0 ± 1.4 m (*N* = 13) in height; elm trees with nests averaged 8.6 ± 1.7 m (*N* = 4). Mesquite trees were significantly shorter than elms (*t* = 1.870, *df* = 15, *P* < 0.05). Nests were located in the top third of trees, or the upper structural canopy, for both tree species. Nest height in mesquite trees averaged 5.5 ± 1.4 m; nest height in elm trees averaged 6.0 ± 0.8 m. Nest heights between tree species were not significantly different (*t* = 0.636, *df* = 15, *P* > 0.05). The average nest height was 5.6 ± 0.3 m.

Eight nests were oriented towards the northwest and northeast and six nests were oriented towards the southwest (Fig. 1). However, nest orientation did not differ from a uniform distribution (Rayleigh's *R* = 3.808, *N* = 17, *P* > 0.05).

Nests were typically constructed from twigs from the same species of nest tree, woven together with grass stalks. External diameter of nests averaged 58 ± 4 cm in width and 71 ± 6 cm in length. Nest cups averaged 31 ± 1 cm in width and 42 ± 4 cm in length. Internal area accounted for an average of 33 ± 4% of the nest area. The nest cup was lined with wool, grass, black baling

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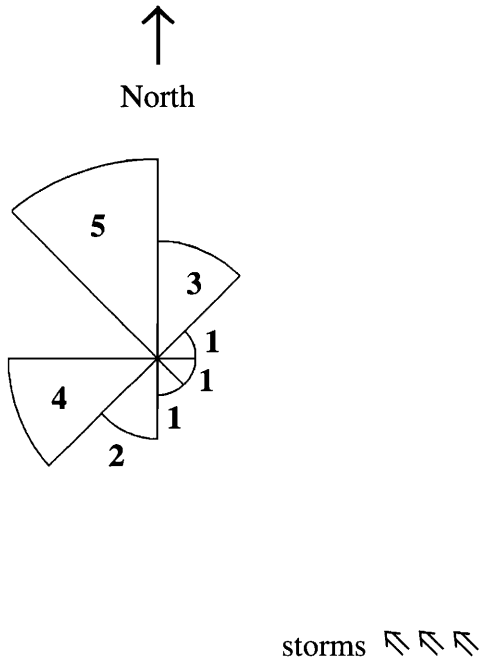


Figure 1. Nest orientation of Crested Caracaras in La Pampa, Argentina. Values are nests open within a 45° sector.

twine, and feathers. Black baling twine was the most common item used to line the nest cup. In one nest, a nestling was found entangled in black baling twine and required extrication. The same nest contained the corpse of a dead nestling with legs entangled in twine. An additional nest contained a dead nestling, also entangled in twine.

The landscape surrounding caracara nests in La Pampa was similar to that described for caracaras nesting in Florida and Texas (Dickinson and Arnold 1996, Morrison 1996); generally open grassland with low ground cover, a low density of tall vegetation, few trees, and scattered brush. Trees in this part of La Pampa have been typically removed from fields; they are found scattered along roadsides, or have been planted for aesthetic beauty, shade or as windbreaks near houses, barns, and corrals. Mesquite trees are more common in the landscape 100-km west in the province of San Luis.

Although mesquite trees used by caracaras were significantly shorter than elms, I obtained neither more detailed measurements of nest tree structure nor data to compare random trees that were not used for nesting. If roadside landscapes are fairly homogenous across this region, choice of the nest tree may be related primarily to structure and cover, not height. In general, mesquite branches are stouter, branch structure is more intertwined, and branches maintain their thorny configura-

tion, thereby providing better structure and cover for caracara nests. Use of elm trees may be related to other structural characteristics or may be a result of the lack of mesquite trees in the vicinity.

Nest dimensions are difficult to measure because nests are frequently reused in consecutive years and become layered in structure and quite large (Bent 1938, Dickinson and Arnold 1996, Morrison 1996). At the end of the nestling period, nestlings stomp the nest flat and it becomes difficult to measure the nest cup or to be sure the peripheral edges of the nest have not deteriorated (Morrison pers. comm.). Nest length in Texas averaged  $59 \pm 5$  cm and nest width averaged  $50 \pm 2$  cm ( $N = 5$ ; Dickinson and Arnold 1996). Florida nests measured 71.1 cm in diameter ( $N = 12$ ; Layne 1996). Nests measured in La Pampa were similar in size.

In both Florida and Patagonia, Crested Caracaras show a strong tendency to orient their nests away from prevailing winds (Travaini et al. 1994, Morrison 1996). During the breeding season in La Pampa, cold storms come from the southeast and warm humid winds come from the subtropical north. Although I found no significant dispersion from random for caracara nests in La Pampa, most nests were generally oriented away from the southeast and towards the north. Since in the Southern Hemisphere the sun crosses the northern sky during the day, the nests facing north are generally facing towards the warm part of the sky and warmer winds.

Across their range, Crested Caracaras use a variety of structural supports for their nests, but typically choose the tallest vegetation available and construct their nests near the top of the nest structure. In Patagonia, nests in aspen (*Populus tremuloides*) were in the lower half of the tree, although nests in *Nothofagus* spp. and *Berberis* spp. were found on top of the substrate (Travaini et al. 1994). In Florida, Texas, and La Pampa, nests were built below the nest-support canopy but tended toward the maximum structural height for the tree species. This suggested some preference for structure or cover in the nest tree, either large enough to support their bulky nests or with cover suitable for protecting young.

In La Pampa, urban growth has proceeded rapidly during the last two decades, resulting in fragmentation of private estates and landscape changes that include persistent loss of native flora. It is reasonable to suspect that the loss of mesquite and other trees resulting from conversion of native vegetation to pasture and agriculture represents loss of breeding structures suitable for use by Crested Caracaras. Although no population data are available for Crested Caracaras in La Pampa, such loss of suitable nest structures may ultimately have a negative influence on the population. Impacts of human activities on these caracaras were also indicated by observations of young becoming entangled in baling twine used to line nests.

RESÚMEN.—Hice un reconocimiento de aproximadamente 2000 km<sup>2</sup> a través de carreteras asfaltadas y de tier-

Table 1. A comparison of Crested Caracara nest and nest tree heights (mean  $\pm$  SE) from several locations across the species' range.

TREE SPECIES	TREE HT (m)	NEST HT (m)	N/T <sup>b</sup>	N	SOURCE <sup>c</sup>
<i>Pachycereus</i> spp.	9.7 $\pm$ 2.2	4.7 $\pm$ 0.8	0.50	18	1
<i>Yucca valida</i>	6.0	4.2	0.71	2	1
<i>Olneya tesota</i>	4.5	4.0	0.89	1	1
<i>Cercidium</i>					
<i>microphyllum</i>	6.0	5.3	0.88	1	1
<i>Washingtonia robusta</i>	9.0	8.5	0.94	1	1
<i>Rosa bracteata</i> <sup>a</sup>	4.3 $\pm$ 1.4	3.7 $\pm$ 1.2	0.86	6	2
<i>Populus tremuloides</i>	19.9 $\pm$ 7.8	8.0 $\pm$ 3.6	0.43	14	3
<i>Maytenus boaria</i>	6.0	4.5	0.76	1	3
<i>Araucaria araucaria</i>	13.0	9.0	0.70	1	3
<i>Berberis darwinii</i>	4.0			1	3
<i>Salix humboldtiana</i>	8.0	4.0	0.50	1	3
<i>Nothofagus</i> spp.	5.0	5.0	1.00	1	3
<i>Sabal palmetto</i>	7.3 $\pm$ 0.2	6.4 $\pm$ 0.2	0.88	83	4
<i>Taxodium distichum</i>	8.5	11	0.77	1	4
<i>Quercus virginiana</i>	8.6	9.3	0.92	1	4
<i>Prosopis</i> spp.	7.0 $\pm$ 1.4	5.5 $\pm$ 1.4	0.79	13	5
<i>Ulmus parvifolia</i>	8.6 $\pm$ 1.7	6.0 $\pm$ 0.8	0.70	4	5
		Mean	0.76		

<sup>a</sup> Includes one nest located in yaupon (*Ilex vomitoria*).

<sup>b</sup> N/T indicates the ratio of nest height to tree height.

<sup>c</sup> Sources: (1) Rivera-Rodriguez and Rodriguez-Estrella 1998, (2) Dickinson and Arnold 1996, (3) Travaini et al. 1994, (4) Morrison pers. comm., and (5) this study.

ra en el norte de La Provincia de La Pampa, Argentina. Encontré 17 nidos de carancho (*Caracara plancus*), 13 en *Prosopis* spp. y 4 en olmos (*Ulmus parvifolia*). El promedio de la altura de los árboles con nidos fue 7.4 m; el promedio de la altura de los nidos fue 5.6 m. Los olmos fueron más altos que los de *Prosopis* spp. (*Ulmus* 8.6 m; *Prosopis* 7.0 m) aunque la altura de los nidos no fué significativamente diferente (*Ulmus* 6.0 m; *Prosopis* 5.5 m). En general, la orientación de los nidos fué distinta a la dirección prevaleciente de los vientos, aunque con la prueba de Rayleigh, no encontré una dispersión significativamente diferente de la normal (Rayleigh's  $R = 3.808$ ,  $P > 0.05$ ). Encontré dos polluelos muertos en nidos en *Ulmus*, con las patas enredadas en cordel de nylon utilizado para embalar pacas de heno. En este reporte, comparé las características de los nidos de carancho en el norte de La Pampa, Argentina, con otras poblaciones de carancho a través de rango de distribución de esta especie.

[Traducción del autor]

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