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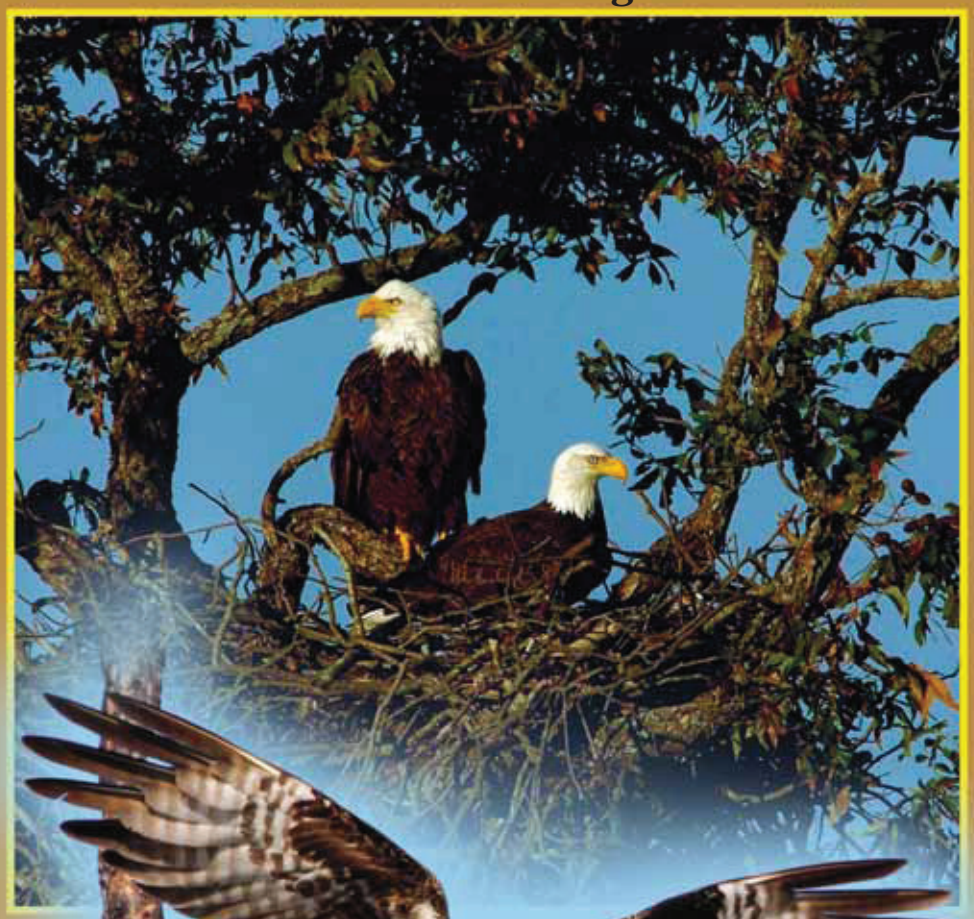

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BEHAVIORAL ECOLOGY OF A BLUE-CROWNED PARAKEET (*ARATINGA ACUTICAUDATA*) IN A SUBTROPICAL URBAN LANDSCAPE FAR FROM IT'S NATURAL RANGE

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ABSTRACT.—I tracked an escaped captive Blue-crowned Parakeet (*Aratinga acuticaudata*) for several months in suburban Houston, Texas, to study aspects of its behavioral ecology. The parakeet was in flight 6% of detections and perched 94%, primarily in a tree, and less frequently on a power line or roof top. Tree species most frequently perched in were pecan (*Carya illinoinensis*), and less frequently in hackberry (*Celtis occidentalis*) or water oak (*Quercus niger*). The parakeet was associated with Rock Doves (*Columba livia*) 11 times (mean flock size = 22.8, r = 3–40). Total MCP home range size of perched locations was ~200 m^2, with the main core area of use ~10 m^2. Comparisons are made with a feral individual that lived among a flock of Red-masked Parakeets (*A. erythrogenys*) in San Francisco.

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Introduced birds are interesting study subjects, as they are outside their natural range and consequently are forced to adapt ecologically or perish. Whether the species fails or thrives in the new environment is a strong indicator of its niche breadth. Indeed, some introduced species that are successful pose an environmental threat as they displace native species (e.g., collared dove, *Streptopelia* sp.), whereas others never really have the numbers to comprise a substantial founder populations (e.g., several species of parrots and finches). While individuals of species introduced in small numbers fail to establish a stable population, their persistence, even if non-permanent, is of interest in terms of how they adapt and live within the new environment (Brooks 2008).

The Blue-crowned Parakeet (*Aratinga acuticaudata*) has a wide range with three allopatric populations in the Guiana Shield of northern South America, northeastern Brazil, and the Chaco (Forshaw 1989). Despite its abundance in at least some areas (c.f., Brooks 1998), there have been relatively few studies on this species. However, Carillo (2007) studied factors affecting reproduction in the Critically Endangered Margarita Island subspecies (*A. acuticaudata neoxena*); whereas Garrett et al. (1997) studied food habits of an introduced population in southern California. However, no studies have focused on certain aspects of behavioral ecology, such as preferred perch type or home range (Forshaw 1989), albeit in a suburban environment far from the species natural distribution. Herein I provide behavioral and ecological observations on an individual Blue-crowned Parakeet that escaped from its owner's house in suburban Houston, Texas.

METHODS

The study area encompassed the following streets borders, all in Houston, Tx (77019): Haddon St. (north border), Woodhead St. (east), Indiana St (south) and McDuffie St. (west). Searches for the parakeet were made during several months (22 June–24 November 2005), and were generally done twice a week (r = 1–4 times/wk) with one or more days between consecutive searches. I rode a standard one-speed bicycle approximately 1–2 km each morning no later than 1 h after sunrise looking for the parakeet. Searches were made in the area where the parakeet was last seen, and then listening for its unmistakable dawn calls until it could be located with its voice. Upon spotting the bird, its location and perch type (including identification of tree, where applicable) was noted, as well as any additional observations (behavior, other species associated with, etc.). For the sake of comparison, data are included for a single *A. acuticaudata* that lived with a very large feral flock of Red-masked Parakeets (*A. erythrogenys*) in San Francisco (Bittner 2005, in litt.), and this group will be referred to as 'the SF population', below.

RESULTS AND DISCUSSION

The parakeet was located 37 times during 31 d of searches, observed once/day except for 6 d when it was observed twice during a given morning.

The parakeet was in flight upon detection twice (6%) and was perched 32 times (94%). Of the 32 observations where the parakeet was perched, it was mostly found in a tree, with less frequent observations on a power line or roof top (Table 1). Most of the observations of the parakeet perching in a tree involved foraging on young fruits or resting; however, it was also observed sunbathing in the crown of a large hackberry once (1 November 2005). More than two-thirds of the trees the parakeet was perched in were pecans (*Carya illinoinensis*), with a few observations in a hackberry (*Celtis occidentalis*), water oak (*Quercus niger*), or unspecified (pecan or hackberry; Table 2). The SF population roosted most frequently in poplar (*Populus sp.*), and used loquat (*Eriobotrya* sp.), pine (*Pinus* sp.), eucalyptus (*Eucalyptus sp.*) and cypress (*Cupressus* sp.) trees to a lesser degree, nesting almost exclusively in palm trees (Bittner in litt.).

Table 1. General perch type used by the Blue-crowned Parakeet in Houston, Texas.

Perch	**#**	**%**
Tree	20	62%
Power line	7	22%
Roof	5	16%
Total	**32**	**100%**

Table 2. Tree species used for perching by the Blue-crowned Parakeet in Houston, Texas.

Tree Species	**#**	**%**
Pecan (*Carya illinoinensis*)	14	70%
Hackberry (*Celtis occidentalis*)	2	10%
Water oak (*Quercus niger*)	2	10%
Unidentified	2	10%
Total	**20**	**100%**

The parakeet was associated with Rock Doves (*Columba livia*) 11 times, with flock size of the perched doves averaging 22.8 (r = 3–40). The majority of the observations (n = 8, 73%) involving the parakeet's association with the doves were during the latter half of the study (September–November), when the parakeet was being offered peanuts each morning by an elderly lady who fed the doves each morning. The parakeet was not observed in association with any other species during the study duration. While doves are not related to *Aratinga*, the parakeet may have associated with a large flock of birds to reduce predator risk, even if they were unrelated. However, if there had been other psittacids in the area, it is likely the parakeet would have associated with such confamilials. For example, as mentioned previously, an individual feral *A. acuticaudata* lived in association with a flock of Red-masked Parakeets (*A. erythrogenys*) (Bittner 2005).

Total home range size as measured with a minimum convex polygon of perched locations was approximately 200 m^2 (Fig. 1). On 8 August 2005 the bird flew in a broad circle spanning approximately 400 m^2 (2 square blocks). In contrast, a home range of approximately 35–55 km^2 was found for the SF population (Bittner in lit.). While home range size will fluctuate substantially with flock size, it also may vary depending upon season and resource availability. Seasonal movements apparently do not occur in nature however for *A. acuticaudata*. For example, in the Paraguayan Chaco this species was present at the same study site year round (Brooks 1997).

Site fidelity of the parakeet was comparatively conservative, with the main core of use being approximately 10 m^2 (Fig. 1). The reason for the small area of core usage was due to the consistent resource of peanuts being offered by the elderly lady. A newly escaped psittacid would have much broader core use, or lack any form of site fidelity entirely. For example, an escaped pet Green-winged Macaw (*Ara chloroptera*) was reported at no less than four individual locations, with a flight path exceeding 6 km (Fig. 2). The first location was

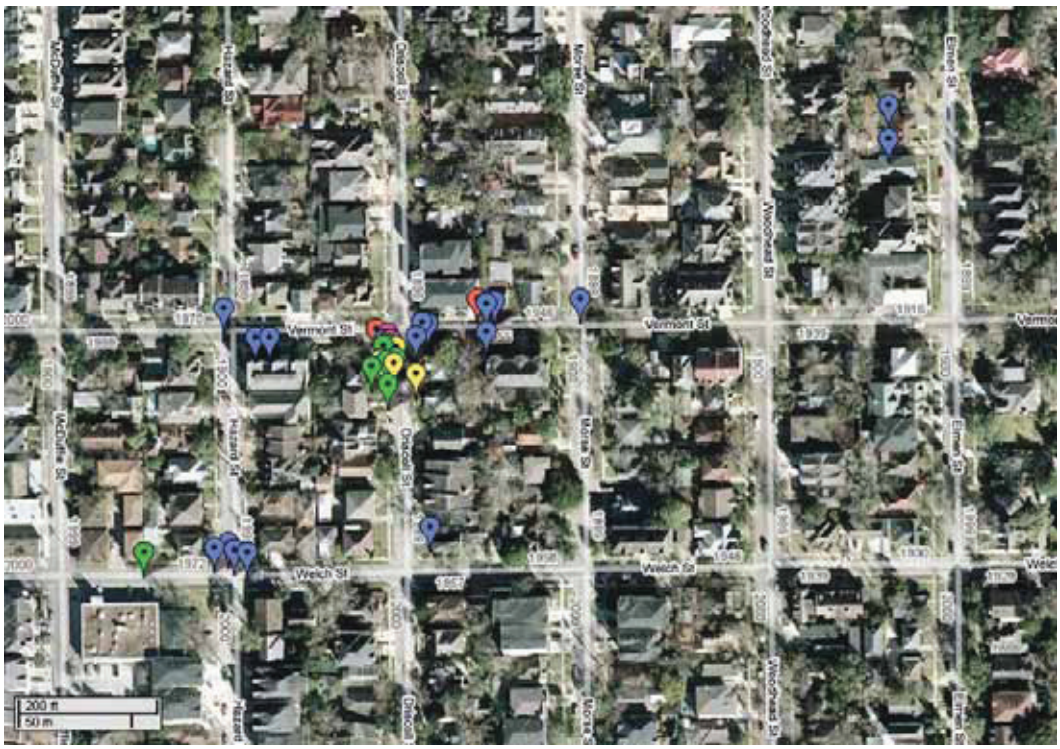

Figure 1. Map of the study region with scale in the lower left corner. **Color Key:** blue = pecan tree (*Carya illinoinensis*), red = hackberry tree (*Celtis occidentalis*), purple = water oak tree (*Quercus niger*), green = phone line, yellow = roof top. Image google.com.

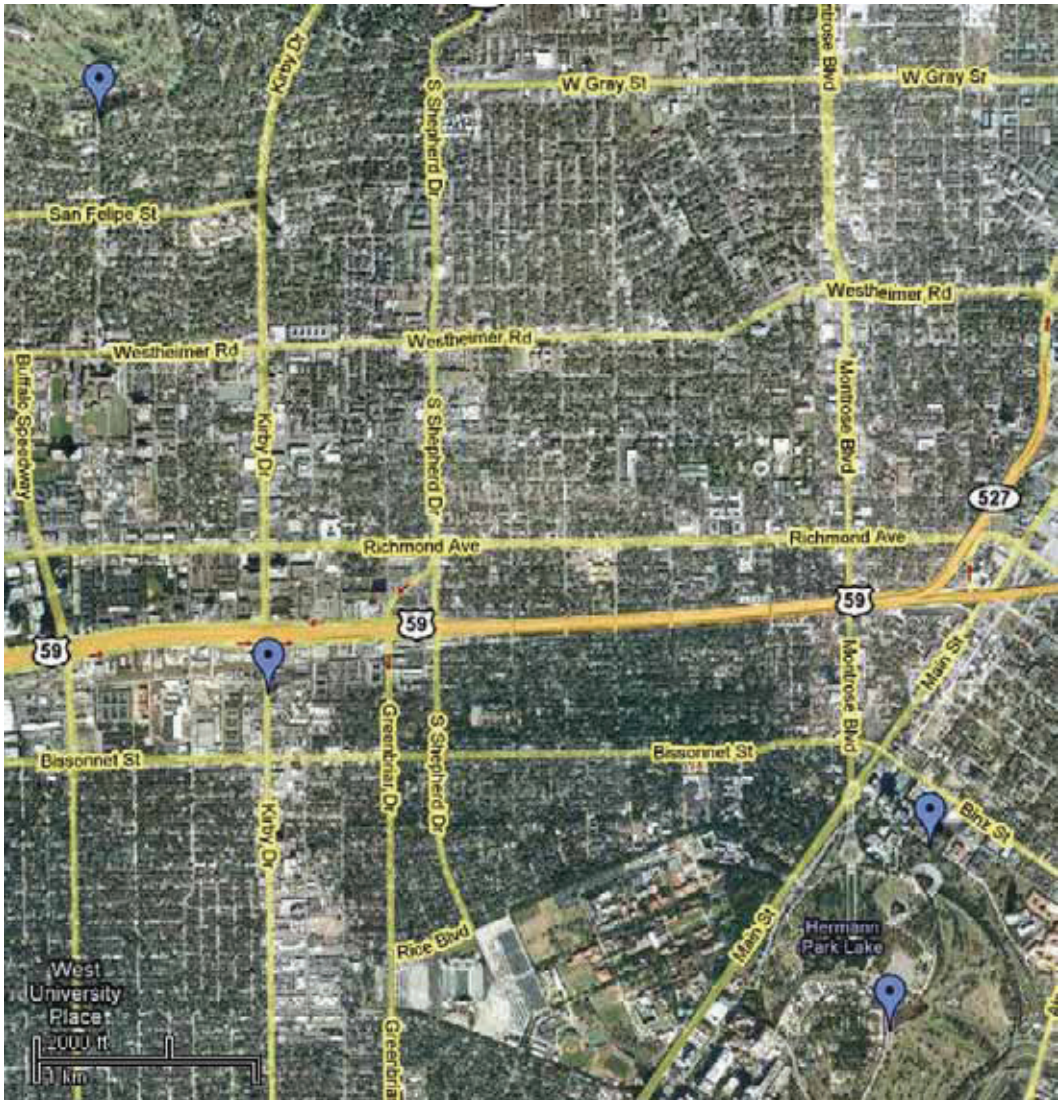

Figure 2. Map of site locations of an escaped Green-winged Macaw (*Ara chloroptera*), spring 1995 (D. Brooks and L. Schoen, unpubl. data). Image google.com.

the high-rise apartment the bird escaped from, and the last two reports were from members of the public dining outdoors on restaurant patios when the tame bird flew onto their table begging for food (D. Brooks and L. Schoen, unpubl. data).

This study provides observations of an urban Blue-crowned Parakeet which were unknown prior, including preferred perch type and tree species, and home range size. Even though the study area is not indicative of the parakeet's true range of distribution, it will be interesting to see whether the data differ from the species in its natural habitat. Comparative studies await data recorded within the natural range of distribution.

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THE EFFECTS OF BODY SIZE AND ROOST SITE ON WINTER DIE-OFF OF CAVE SWALLOWS

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ABSTRACT.—An unusually cold and wet weather event occurred in San Marcos, Texas, USA during January 2007, resulting in large numbers of dead Cave Swallows (*Petrochelidon fulva*). Surveys of all known roosting areas within the city limits revealed a complete die-off of Cave Swallows; we collected 123 dead swallows from eight roost sites. Measurements of dead swallows indicated the birds that died along Interstate underpasses during the cold spell had smaller bodies yet were heavier than those in a parking garage. Thermometers placed at the two roosting site types revealed that the underpasses were ~5 °C colder than the parking garage site during the coldest part of the day. Extreme temperatures may have affected Cave Swallows using underpasses more so than swallows roosting in the parking garage. Higher post-mortem body condition (log mass/log tarsus length) may suggest death from starvation for birds in garage and cold exposure for birds under bridges. Future studies that examine environmental differences between multiple roost sites may provide stronger support for our findings and have implications for northward range expansions of species in the face of global climate change.

The effects of winter mortality have long been speculated as a driving force in the evolution of animal morphology in temperate climes (Darwin 1859). Cave Swallows (*Petrochelidon fulva*), at the northernmost extent of the their range in Texas and New Mexico, occasionally encounter extreme low temperatures and long periods of precipitation in winter and early spring (Witzeman et al. 1979, West 1995). Historically, caves serve as primary nesting and roosting sites for Cave Swallows, but breeding colonies have been reported in sinkholes, under bridges, in culverts, and similar structures (West 1995). Human-made structures have been hypothesized to facilitate the northward expansion of Cave Swallows (Martin and Martin 1978, Martin 1981, West 1995). Cave Swallows expanded their breeding range in Texas dramatically and colonized portions of central and south Texas by the 1990s (West 1995, McNair and Post 2001, Kosciuch et al. 2006). Most Cave Swallows are resident, but breeding populations in New Mexico and Texas may migrate south in winter (West 1995).

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