The Wilson Journal of Ornithology 125(4):800–808, 2013

ECOLOGY, BEHAVIOR, AND REPRODUCTION OF AN INTRODUCED POPULATION OF RED-VENTED BULBULS (*PYCNONOTUS CAFER*) IN HOUSTON, TEXAS

DANIEL M. BROOKS[1]

ABSTRACT.—Results are reported from a citizen-science program to study the ecology, behavior, and reproduction of an invasive population of Red-vented Bulbuls (*Pycnonotus cafer*) in Houston, Texas. The most frequent behaviors are foraging ($n = 69$), resting ($n = 45$), and calling ($n = 29$). The entire population occurred in urban areas. Bulbuls consumed berries ($n = 8$ species), fruits ($n = 5$), flowers ($n = 5$), and buds ($n = 4$); some insects are also included in the diet. Nine of the 20 species of identified plants consumed are exotics found within the native range of the bulbul, six are exotics found outside the native range, and five are native Texas species. The most common of the 35 species of plants that bulbuls perched in are bamboo (*Bambusa* sp.), crape myrtle (*Lagerstroemia indica*), edible fig (*Ficus carica*), and tallow (*Sapium sebiferum*). Flock size averaged 2.3 birds/flock (range = 1–22) and the largest flocks (12–22 birds) are in late summer and early winter. Bulbuls are not migrants; peak observations are during spring and summer, with lower numbers during October. General biology is similar between Houston bulbuls, native populations in Asia, and other invasive populations in the Northern Hemisphere. This alien population is not a serious agricultural pest or disperser of weedy seeds, does not compete with native species, and has not expanded beyond the Houston region in the continental United States. *Received 27 February 2013. Accepted 27 May 2013.*

Key words: avian ecology, citizen-science, invasive species, *Pycnonotus cafer*, Red-vented Bulbul.

The effects of invasive species upon native species and communities range from unharmful to devastating (Lockwood et al. 2007). The brown tree snake (*Boiga irregularis*), invasive to Guam among other Micronesian islands, is devastating to both endemic bird communities and human populations (Fritts and Rodda 1998). Monk Parakeets (*Myiopsitta monachus*), while not especially harmful to native birds, have caused extensive economic loss from their massive twig nests causing damage to electrical lines (Newman et al. 2008). Other invasive species such as European Starlings (*Sturnus vulgaris*) out-compete native cavity-nesting birds for limited nest sites (Cabe 1993).

The Red-vented Bulbul (*Pycnonotus cafer*; referred to as ''bulbul'' herein) is native to Pakistan, India, and Sri Lanka eastward to Viet Nam through southern China (Islam and Williams 2000, Fishpool and Tobias 2005). Throughout its native and introduced range, this species is found in a variety of habitats, including urban gardens and secondary growth (Islam and Williams 2000, Fishpool and Tobias 2005). Perhaps owing in part to its eurytopic habitat association, it is an established invasive species in areas of the Middle East and various tropical Pacific islands (Long 1981, Fishpool and Tobias 2005). A previously unstudied population is established in Houston, Texas.

In parts of their introduced ranges, bulbuls feed on a variety of cultivated plants and thus are in direct conflict with humans (Islam and Williams 2000). Additionally, invasive bulbuls are potential dispersers of weedy seeds and may compete with native birds (Islam and Williams 2000). While invasive populations of bulbuls have been studied in Polynesia (Dhondt 1976a, b, 1977; Watling 1977; Pernetta and Watling 1978) and Oahu (Bremer 1977; Williams 1983, 1987; Williams and Giddings 1984), ecological studies of invasive populations on any continental land mass are lacking.

Relatively little work has been done with alien birds in the state of Texas (c.f., Brooks 2009, 2012). In June 2008, I initiated the Texas Invasive Bird Project, a citizen-science study targeting six avian species invading the state, one of which is the Red-vented Bulbul. Using reports generated from this project, the objective of this study is to elucidate the ecology, behavior, and reproduction of the Red-vented Bulbul in Houston, Texas, USA, while hypothesizing this species is not currently an ecological threat in Houston.

METHODS

To document invasive bird species in the area, I designed a questionnaire to be made available at several local birdwatching clubs, annual birdwatching festivals, circulated on Texas birdwatching

[1] Houston Museum of Natural Science, Department of Vertebrate Zoology, 5555 Hermann Park Drive, Houston, TX 77030, USA; e-mail: dbrooks@hmns.org

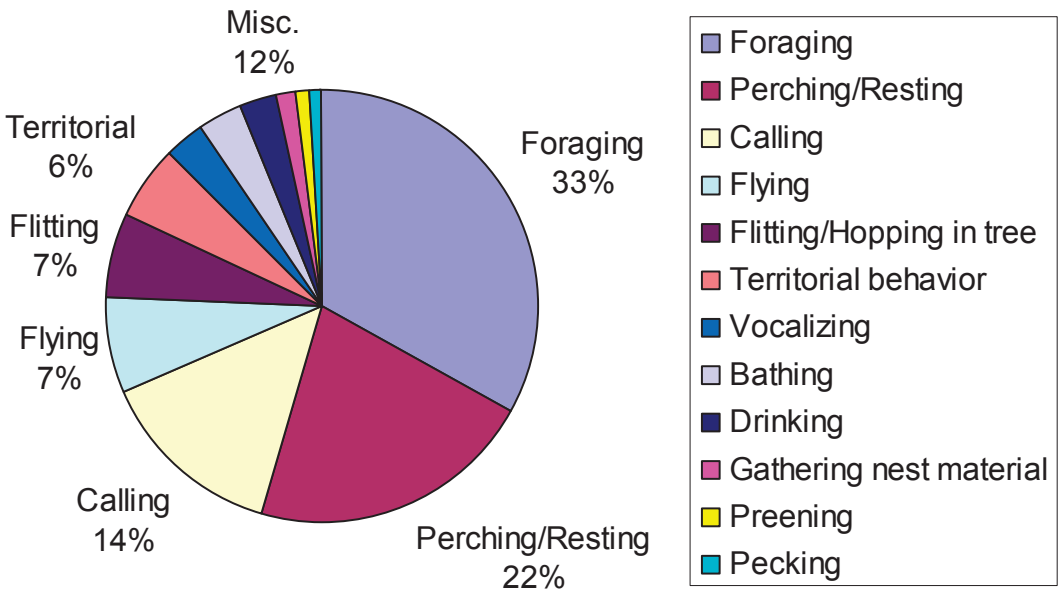

FIG. 1. Bulbul activity patterns in Houston, Texas (Jun 2008–May 2012).

internet list-servs, and posted on-line at: www.hmns.org/files/invasivebirds.doc. The majority of the questionnaire respondents fell into two broad categories: (1) birdwatchers who are familiar with bulbuls, and (2) horticulturists who maintain diverse gardens and enjoy the urban wildlife that visits. In cases of wildlife that could not be identified, most of the respondents sought help on the internet which ultimately led to the bulbul photograph on the questionnaire. When returning the questionnaire, most respondents indicated they were enthusiastic about being able to identify the bird they saw.

Respondents seemed honest and conservative; if they did not know the answer to a given question they left it blank or stated they did not know. In most cases, respondents included voucher photographs and/or a written description of the birds and habitat to confirm documentation. I proofed the citizen scientist data for accuracy to ensure that birds, plants, habitat, and abiotic parameters were accurately designated and identified by: (1) examining all photographs and (2) ground truthing ~15% of the sites via direct visits. In some cases, I was able to obtain plant, habitat, and abiotic parameter data from submitted photographs if those portions of the questionnaire were left blank. In a few cases where plants were not obvious, I confirmed species designation with museum staff botanist (N. Greig).

I tabularized results in respective sections of a database for analyses. Occasionally responses were anthropomorphized, whereupon I interpreted the information accordingly (e.g., ''two birds in love who spent the day chatting away'' = ''a vocalizing pair''). In cases where reports provided numerical data in feet, I converted the data to meters. In cases where numerical data were provided as a range, I used the average between the minimum and maximum (e.g., perched 20–25 feet = 22.5 feet = 6.8 m). I did not include insufficiently completed questionnaires in analyses.

Data used herein span 4 years (Jun 2008–May 2012) but information is still being collected for possible future analyses. Data for the distribution portion of this study spanned through February 2013 to ensure more thorough documentation of dispersal. I obtained older dates preceding the initiation of the study (Jun 2008) from respondents and eBird reports (eBird 2013).

RESULTS

The most frequent three of the 12 activities (Fig. 1) are foraging (n = 69), perching or resting (n = 45), and calling (n = 29).

Foraging.—Bulbuls consume berries (n = 8 species), fruits (n = 5), flowers (n = 5), and buds (n = 4; Table 1). Nine (45%) of the 20 species of identified plants are exotics found within the native range of the bulbul, whereas six (30%) are

TABLE 1. Plant species consumed and perched on by invasive Red-vented Bulbuls (*Pycnonotus cafer*) in Houston, Texas (2008–2012).

			Plants consumed[a]				Plants perched on			
							Numeric data	Relative data		
Plant species	Latin name	Origin[b]	Berry	Fruit	Flower	Bud	Perch ht (m)[c]	Low	High	No data
American beautyberry	*Callicarpa americana*	N	3							1
American elm	*Ulmus americana*	N							1	
American sycamore	*Platanus occidentalis*	N							1	
Azalea	*Rhododendron* sp.	N					1.3			
Bald cypress	*Taxodium distichum*	N						1	1	
Bamboo	*Bambusa* sp.	EB					5.2 (2.5–10) 8			6
Bamboo, Sacred	*Nandina domestica*	EB	1							1
Bauhinia	*Bauhinia* sp.	EB			6		2.5			7
Camphortree	*Cinnamomum camphora*	EB		1						2
Common hackberry	*Celtis occidentalis*	EB					8			1
Crapemyrtle	*Lagerstroemia indica*	EB			4	3	3.8 (1.7–6.7) 5		1	8
Edible fig	*Ficus carica*	EB		10			1.5		1	10
Elderberry	*Sambucus nigra*	N					3.2			
Firethorn	*Pyracantha* sp	EB	1							
Hibiscus, Chinese	*Hibiscus rosa*	EB			1		2.1 (1.5–2.7) 2			
Hibiscus, Terri's pink mallow	*Hibiscus paramutabilis*	EB				1	1.5			
Jasmine, Orange	*Murraya paniculata*	EB					1.8			
Kumquat	*Fortunella* sp.	EB					1			
Lantana	*Lantana camara*	EO	3							1
Lilac Chastetree	*Vitex agnus castus*	EO					1.8			
Magnolia, (Japanese)	*Magnolia* sp.	EB				2	3.6 (2.7–4.5) 2			1
Mallow, Wax	*Malvaviscus drummondii*	N	1							1
Mimosa	*Albizia* sp.	EB						1	1	
Mulberry	*Morus alba*	EB					2.4			
Oak	*Quercus* sp.	N					12.9 (6–28) 4		2	
Palm, Washington fan	*Washingtonia robusta*	EO		1	1					
Palm, Parlor	*Chamaedorea elegans*	EO		1			1.3			
Passion flower vine	*Passiflora incarnata*	N								1
Pear	*Pyrus* sp.	EO				1	7.6			1
Pecan	*Carya illinoinensis*	N					9.4 (5–12.5) 3		3	2
Pine	*Pinus* sp.	N						1		
Pine, Loblolly	*Pinus taeda*	N								1
Plum, Mexican	*Prunus mexicana*	N							1	
Redbud	*Cercis canadensis*	N					2.4			

TABLE 1. Continued.

Plant species	Latin name	Origin[b]	Plants consumed[a]				Plants perched on			
							Numeric data	Relative data		
			Berry	Fruit	Flower	Bud	Perch ht (m)[c]	Low	High	No data
Redcardinal	*Erythrina herbacea*	N			1		2.7			
Snailseed	*Cocculus carolinus*	N	1							
Tallow, Chinese	*Sapium sebiferum*	EB					20.2 (9–35) 6	2	2	2
Tomato	*Solanum lycopersicon*	EO	1							
Trumpet Creeper	*Campsis radicans*	N					3			
Yaupon	*Ilex vomitoria*	N	1							
Yucca, False	*Hesperaloe parviflora*	EO	1							1
Unidentified tree/shrub			1	1			3.4 (0.5–6.1) 7	1	2	5

[a] The number of reports (e.g., 1 or 2) for each food type is quantified in respective columns.
[b] EB = Exotic plant whose native range lies within the native distribution of the bulbul; EO = Exotic plant whose native range lies outside the native distribution of the bulbul; N = Native Texas plant.
[c] In cases where plant/perch height sample size was >1, data are reported as: mean (range) sample size.

exotics found outside the native range and five (25%) are native Texas plants (Table 1).

There are 12 cases of insectivory, at least six of which involve gleaning insects from a plant, including bamboo (*Bambusa* sp.) twice, and once each for edible fig (*Ficus carica*), Rangoon creeper (*Quisqualis indica*), and tomato (*Solanum lycopersicon*). Insects found on tomatoes were identified as stink bugs (Pentatomidae or Coreidae). Other modes of foraging include sallying for flying insects ($n = 2$) and masticating insect prey on the ground ($n = 1$) or a utility line ($n = 1$).

Habitat and Perch Use.—Nearly all ($n = 74$, 96%) of the 77 reports describe residential suburb as the primary habitat. Other cases include small fragments of secondary growth within a mosaic of urban parkland along White Oak Bayou ($n = 2$) and an individual flying across the street between parkland habitat and suburbs ($n = 1$).

Bulbuls perch on 35 species of plants. Species most frequently used for perching are bamboo and crape myrtle ($n = 14$ each), edible fig and tallow ($n = 12$ each, Table 1). Bulbuls perch in 15 different plant species (43%) native to Texas, 15 species (42%) of exotics found within the native range of the bulbul, and 5 species (14%) of exotic plants found outside the native range (Table 1). Mean perch height on plants is 6.2 m (range = 1.7–14.5, $n = 19$; Table 1). Of the 10 different categories of abiotic perches, the most frequent are phone and utility wires ($n = 17$) followed by bird baths and water fountains ($n = 9$; Table 2). Mean perch height on abiotic structures is 3.4 m (range = 1.2–9.1, $n = 23$; Table 2).

Seasonal Flock Dynamics.—Bulbuls are nonmigratory residents that are present throughout the year (Figs. 2, 3). The largest flocks (12–22 birds; Fig. 2) occur August–September and December–January. The flock of 22 birds in August was attracted by the fruits of a Washington fan palm (*Washingtonia robusta*). When the palm was removed the following day, the flock left the area.

Flock size averages 2.3 birds/flock (mode = 2, range = 1–22). There are no significant differences between pairs and singletons on any given month except for March ($X^2 = 3.6$, df. = 1, $P = 0.05$; Fig. 3). However pairs of birds are more frequent than singletons each month except for late summer through fall (Aug, Oct, and Nov) when singletons are more frequent (Fig. 3). Pairs of birds ($n = 63$) are significantly more frequent than singletons ($n = 40$; $X^2 = 5.3$, df. = 1, $P = 0.02$) when considering totals.

TABLE 2. Abiotic structures used for perching by invasive Red-vented Bulbuls (*Pycnonotus cafer*) in Houston, Texas (Jun 2008–May 2012).

	Numerical data	Relative data	
Abiotic structure	Perch height (m)[a]	Low	High
Bird feeder		3	
Water fountain/bath	3 (3) 9		
Vegetable garden		1	
Tomato garden cage	1.2		
Fence (chain link, decorative, trellis)	1.5 (0.5–2.3) 7		
Metal stake	2		
Phone/light pole			3
Utility/phone wire	7.2 (6–9.1) 4		13
Roof edge			1
Aluminum window frame	6.8		

[a] In cases where structure/perch height sample size was >1, data are reported as: mean (range) sample size.

Reproduction.—Courtship display was observed 18–25 March. Observers documented the gathering of nest material (e.g., pulling twigs from gutters) on 23 and 26 March, 12 April, and 17 May. On the latter date, the pair of bulbuls harassed a Blue Jay (*Cyanocitta cristata*) that was too close to the nest site. Single nests in early May and mid-July were in crape myrtle 3.3 and 3.0 m off the ground, respectively. The first was constructed of tightly woven grasses and pliable vegetation and the second was in the center of the tree. The pair observed in July repeatedly chased a Great-tailed Grackle (*Quiscalus mexicanus*) that would not leave the area, and they also mobbed an unidentified hawk flying over.

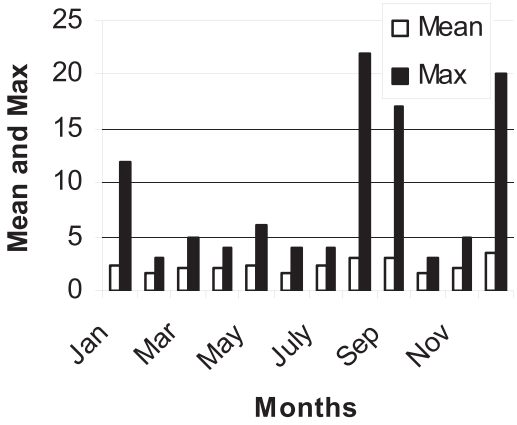

FIG. 2. Monthly mean and maximum values for flock size of bulbuls in Houston, Texas (Jun 2008–May 2012).

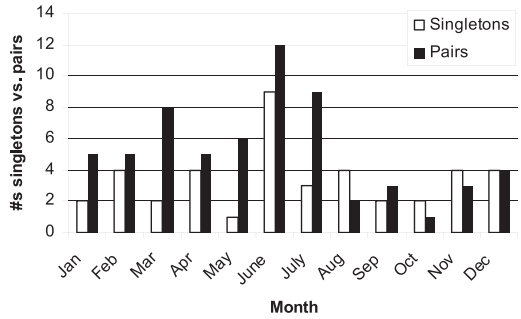

FIG. 3. Monthly abundance of singletons vs. pairs of bulbuls in Houston, Texas (Jun 2008–May 2012).

Observers reported observations of fledglings as follows: a female with fledgling (Mar), two adults with smaller sub-adult (21 Apr), a fledgling admitted to a wildlife rehabilitation clinic (24 Apr), two fledglings being fed crape myrtle (four observations spanning 13–17 Jul), a female observed feeding a ~7.5 cm tall fledgling (21 Jul), a fledgling admitted to a wildlife rehabilitation clinic (18 Aug), and a young bird that appeared to be begging for food (1 Sep).

Distribution.—A total of 117 different sites where bulbuls have been observed were plotted on a map (Fig. 4). Yet, the origin of the bulbuls in Houston is unknown. Ostensibly, some could have arrived on large cargo barges from southern Asia that docked in the Houston Ship Channel along the eastern reaches of Buffalo Bayou (Fig. 4). The bulbuls would then have gradually dispersed west and north along the bayou system towards White Oak Bayou, where the birds found plenty of safe urban gardens in an area known as the Heights (essentially north of White Oak Bayou and west of Little White Oak Bayou).

DISCUSSION

Comparisons with Bulbuls in their Native Range.—Only five of the 20 identified plants which bulbuls fed on are native to Texas. Nine of the remaining 16 are exotics found within the bulbul's native range. Fishpool and Tobias (2005) identified 65 plant genera known to be consumed by bulbuls, although feeding on exotic plants was not distinguished from those taken within the native range. Methods of insect capture and handling (i.e., sallying, gleaned from a plant, or brought to the ground for mastication) are also among the foraging behaviors observed in natural

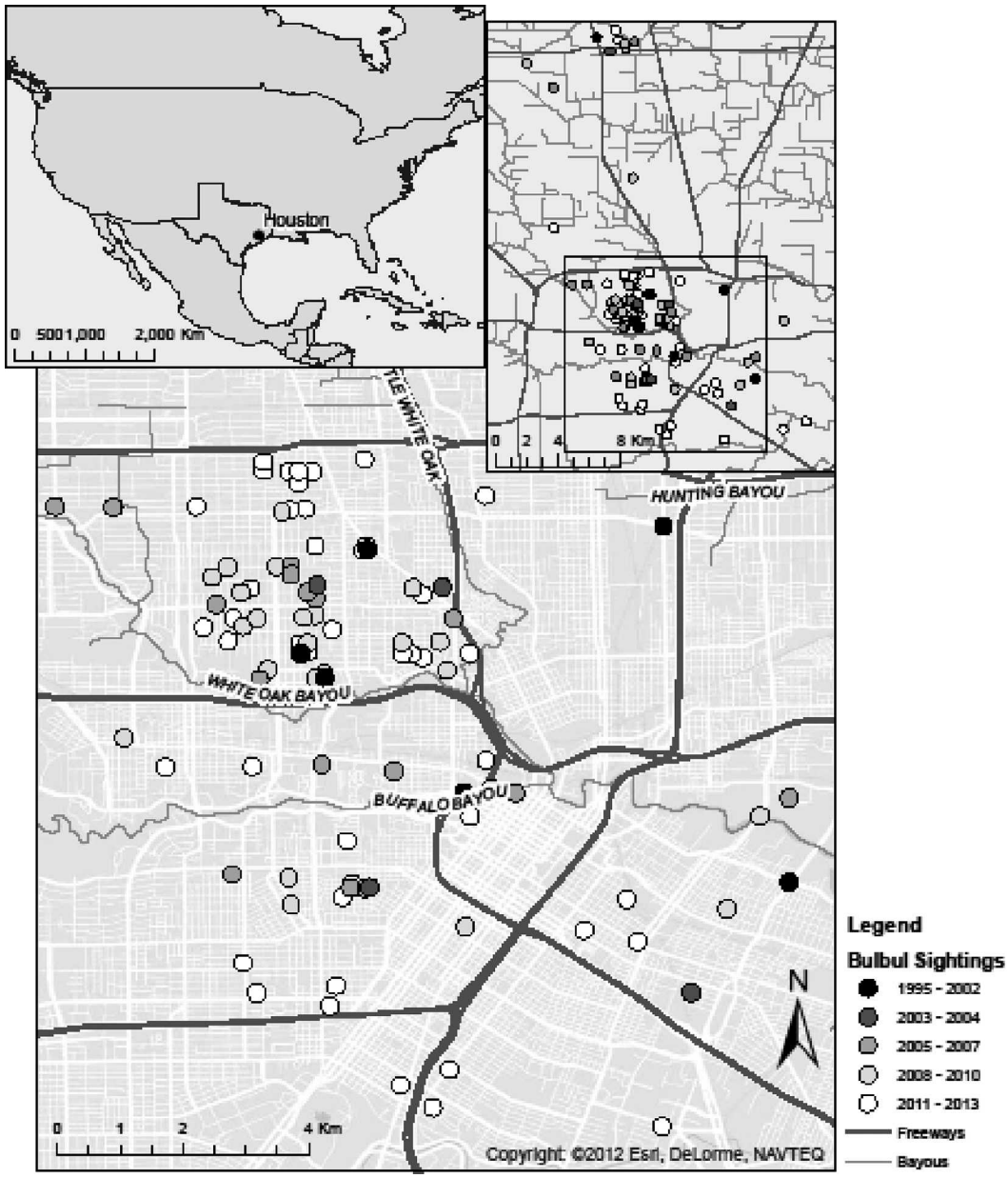

FIG. 4. Distribution of bulbuls within the city of Houston, Texas (Jun 2008–Feb 2013).

populations (c.f., Islam and Williams 2000, Fishpool and Tobias 2005).

In their native range, bulbuls are found from 0 to >2,000 m from forest edge, as well as gardens and cultivated areas (c.f., Islam and Williams 2000). Virtually all of the bulbuls in Houston are found in residential gardens at sea level, with the only other cases being fragments of secondary habitat in edge situations. Bulbuls in this study use a diverse array of plants (35 species) as perches. Although bulbuls perch in 15 species of native Texas plants and 15 indigenous to their native range, the four most commonly used as perches are invasive species (bamboo, crape myrtle, fig, and tallow) found within the natural range of the bulbul. These results corroborate the

model of invasive species succeeding in human-altered environments where ecological niches are available that were unexploited by native species (c.f., Lockwood et al. 2007).

In India and Pakistan, bulbuls form pairs from February through November (Ali and Ripley 1971). Similarly, in this study, pairs of birds are more abundant than singletons from January–September. In their native range, bulbuls are not highly gregarious during breeding season and are usually seen in pairs or small family parties, with larger gatherings (20–100 birds) occurring when food is seasonally abundant during the non-breeding season (c.f., Islam and Williams 2000). In Houston, the largest flocks are much smaller (maximum = 22) but are similarly observed outside the breeding season.

Bulbuls are year-round residents in Houston, as well as in their native range (Ali 1977). However, seasonal movements in their native range occur in response to environmental conditions, including following rain and moving altitudinally in response to seasonal shifts in temperature (Fishpool and Tobias 2005). It is possible that some seasonal local movements occur in the Houston populations, as some of the reports indicated that bulbuls are usually present during the same period interannually. For example, we observed a pair of birds on our property 18–22 March 2007 and again one year later on 24 March 2008. Whether this was the same pair of birds is unknown, yet such observations warrant banding studies to learn more about seasonal site fidelity.

Comparisons with other Invasive Populations of Bulbuls.—Red-vented Bulbuls are known to thrive in Arabia (U.A.E., Kuwait, Qatar, and Oman), Polynesia (Fiji, Samoa, and Tonga) and Oahu, Hawaii, with failed attempts to colonize parts of Australia and New Zealand (Long 1981, Fishpool and Tobias 2005). The congeneric Red-whiskered Bulbul (*P. jocosus*) is also an established invasive in parts of the Nicobar and Mascarene island chains, Australia, Singapore, Oahu, southern California, and Florida (Islam and Williams 2000). Overall, the Houston population is similar to other invasive populations of both Red-vented and Red-whiskered bulbuls. While subtle differences in breeding season occur between invasive populations of the two species, more extreme differences are found between Northern versus Southern Hemisphere populations regardless of species.

The Red-vented Bulbuls in Houston share foraging and roosting techniques with other invasive populations of bulbuls (Bremer 1977, Islam and Williams 2000); they exhibit similar general foraging habits (Carleton and Owre 1975, Watling 1977, Islam and Williams 2000) and inhabit similar suburban habitat, although Red-whiskered Bulbuls also utilize citrus orchards (Watling 1977, Williams and Giddings 1984, Islam and Williams 2000).

While dates of pair formation are similar between Red-vented Bulbuls in Houston and in their native range, invasive populations in the Southern Hemisphere form pair bonds November–January (Dhondt 1977, Watling 1977). A similar pattern is evident for Red-whiskered Bulbuls, with Northern Hemisphere pairs bonding winter through summer (late Feb–Jul in Florida, Jan–Aug in Oahu), and August–March in Australia in the Southern Hemisphere (Berger 1975, Carleton and Owre 1975, Long 1981, Islam and Williams 2000).

Red-whiskered Bulbuls begin nest-building in February in Oahu and Florida, and Red-vented Bulbuls begin in March in Oahu, Fiji (Carleton and Owre 1975, Watling 1977, Islam and Williams 2000), and Houston. Red-vented Bulbul fledgling periods are similar between Houston (Mar–Sep) and Oahu (typical months: Apr–Jun, extreme: Jan–Oct; Islam and Williams 2000). The fledgling period for Red-whiskered Bulbuls in Oahu is typically March through May (extreme: Feb–Aug), although late fledglings are rare in Oahu, and apparently do not occur at all in Florida (Islam and Williams 2000).

Both species are non-migratory (Long 1981). Flocks of 20–100 will gather at resource blooms (Watling 1977, Islam and Williams 2000), reflecting the case in Houston when a flock of 22 Red-vented Bulbuls gathered to feed at a fruiting Washington fan palm but left when the palm was removed.

Are Introduced Bulbuls a Threat in Houston?—Bulbuls are a well-established invasive species considered agricultural pests in parts of their invasive range such as Oahu. This reputation is because of their habit of consuming orchid and hibiscus buds (Denny 2010), two plants commercially farmed in Oahu. For example, bulbuls and the invasive Japanese White-eyes (*Zosterops japonicus*) damaged up to 75% of dendrobium orchids in plantations (Hawai'i Audubon Society 1989, Cummings et al. 1994). However, neither

orchids nor hibiscus are commercially farmed in Houston, thus bulbuls are not an economic threat to a Houston-based exotic plant industry.

Bulbuls are potential dispersers of noxious weedy seeds (Islam and Williams 2000). For example, captive bulbuls of the invasive population in Fiji successfully germinated the following species: spiked pepper (*Piper adancum*, 90% germinated), guava (*Psidium* sp., 87%), cape gooseberry (*Physalis peruviana*, 35%), and prickly nightshade (*Solanum torvum*, 28%; Watling 1977). While tropical weedy species are poorly established in Houston, it is important to note the potential that bulbuls have as successful seed dispersers. Additionally, tallow (a strongly *r*-selected invasive tree), despite being one of the most frequently used perch types, is not consumed by bulbuls, thus not likely to be dispersed.

Although Watling (1977) did not consider invasive bulbuls in Fiji to be a threat to native birds, Islam and Williams (2000) indicate they may be potentially harmful competitors in other areas. For example, certain lowland dwelling populations of O′ahu ′Amakihi (*Chlorodrepanis flava*; Lindsey et al. 1998) and Hawai′i ′Elepaio (*Chasiempis sandwichensis*; VanderWerf 1998) may both compete with introduced bulbuls in Oahu. Reports involving interspecific interactions in the population in Houston were very limited and therefore not described in detail. Of note however, aggression is displayed towards smaller more passive species at bird feeders, and larger species too close to a nesting pair which can stimulate mobbing behavior. Overall, Houston's population of bulbuls shows little agonistic aggression towards other species of birds.

Approximately one-half of all locations of bulbuls are concentrated in the Heights (north of White Oak Bayou and west of Little White Oak Bayou; Fig. 4). Several recent sightings (since 2011) are south of Buffalo Bayou, suggesting the range is expanding to the south. A second population in the Greenspoint area of Houston (far north, right inset; Fig. 4), although smaller than the Heights population, has also been present since the mid-1990s (eBird data, 7 Feb 2013). The origin of the population in Greenspoint is unknown, but it is possible that some escaped from captivity. There are two locations where bulbuls were documented midway between the Heights and Greenspoint populations, suggesting these two populations may be contiguous in the future.

It appears that Houston's introduced bulbul population is not currently an environmental threat, although they should be closely monitored in light of issues with other invasive populations. In the continental United States, this invasive species has not expanded beyond the city of Houston, and the most concentrated part of the population is stably harbored within a relatively small area (<20 km^2; Fig. 4). Maximum flock size is smaller, and large flocks are not encountered with any frequency in Houston, when compared to native Asian populations. Additionally, Houston's bulbuls do not deplete populations of native plants for consumption. It is possible that the birds are selecting species from within their natural range in Asia to perch in (bamboo, crape myrtle, fig and tallow) or consume (nine of 20 species).

ACKNOWLEDGMENTS

I am most grateful to A. Conn for producing the map, and also to N. Greig for helping to confirm some of the plant identifications. Kind thanks to J. Berner and D. Sarkozi for providing summarized eBird data, and to F. Collins, D. Sarkozi, J. Berner, and D. Shepler for help distributing data sheets and collecting data. This study would not have been possible without reports provided from the following individuals: J. Aplaca, J. Bailey, N. Baker, S. Ball, T. Barkin, L. Bedre, J. Berner, J. Bonilla, M. Brooks, N. Brown, A. Carillo, J. Clark, F. Collins, A. Crowe, D. Davey, D. Diggons, J. Dodson, C. Eckels, H. Elmore, R. Even, N. Frost, T. Goings, J. Granberry, N. Greig, E. Gronfor, R. Hadley, K. Hamel, J. Hart, T. Helm, R. Hill, D. Hollas, J. and L. Holley, J. Hull, H. Jarvis, J. Jasek, K. Kane, M. Kelinske, D. Kerr, R. Labs, K. Lea, D. Leflar, P. Lester, D. Logue, A. McGinnis, K. McNamara, S. Hall Mitchell, D. Moore, R. Neel, B. Nowak, C. Ottenweller, K. Prager, P. Randall, T. Ritenour, R. Rojas, S. Rosmarin, D. Sarkozi, M. Schell, J. Schneider, S. Schwaller, D. Shepler, A. Souza, E. Spalding, E. Stone, S. Szabo, R. Taylor, Tiko, L. Trendell, M. Turner, R. Vasquez, K. Walker, P. Wall, S. Watson, D. Webb, S. Yeliseev, and N. Zamarron. I am grateful to B. Honig, M. Bomberger Brown, J. Lockwood, S. Mayes, C. Geiselman, and two anonymous reviewers for critically reviewing or commenting on the manuscript.

LITERATURE CITED

ALI, S. 1977. Field guide to the birds of the eastern Himalayas. Oxford University Press, New York, USA.

ALI, S. AND S. D. RIPLEY. 1971. Handbook of the birds of India and Pakistan. Volume 6. Oxford University Press, New York, USA.

BERGER, A. J. 1975. Red-whiskered and Red-vented bulbuls on Oahu. Elepaio 36:16–19.

BREMER, D. 1977. Red-vented bulbuls roosting in a banyan tree. Elepaio 37:99.

BROOKS, D. M. 2009. Behavioral ecology of a Blue-crowned Conure (*Aratinga acuticaudatus*) in a subtropical urban landscape far from its natural range. Bulletin of the Texas Ornithological Society 42:78–82.

BROOKS, D. M. AND G. PAGE. 2012. High diversity of invasive passerids at a park in southeast Texas. Bulletin of the Texas Ornithological Society 45.

CABE, P. A. 1993. European Starling (*Sturnus vulgaris*). The birds of North America. Number 48.

CARLETON, A. R. AND O. T. OWRE. 1975. The Red-whiskered Bulbul in Florida: 1960–1971. Auk 92:40–57.

CUMMINGS, J. L., J. R. MASON, D. L. OTIS, J. E. DAVIS, AND T. J. OHASHI. 1994. Evaluation of methiocarb, ziram, and methyl anthranilate as bird repellents applied to dendrobium orchids. Wildlife Society Bulletin 22:633–638.

DENNY, J. 2010. Birds of Hawaii. University of Hawaii Press, Honolulu, USA.

DHONDT, A. 1976a. Bird notes from the kingdom of Tonga. Notornis 23:4–7.

DHONDT, A. 1976b. Bird observations in western Samoa. Notornis 23:29–43.

DHONDT, A. 1977. Breeding and postnuptial molt of the Red-vented Bulbul in western Samoa. Condor 79:257–260.

EBIRD. 2013. Ebird: Red-vented Bulbul. ebird.org/ebird/tx/map/revbul?neg=true&env.minX=&env.minY=&env.maxX=&env.maxY=&zh=false&gp=false&mr=1-12&bmo=1&emo=12&yr=1900-2013&byr=1900&eyr=2013 (accessed 21 Feb 2013).

FISHPOOL, L. D. C. AND J. A. TOBIAS. 2005. Family Pycnonotidae (Bulbuls). Pages 124–251 *in* Handbook of the birds of the world. Volume 10. Cuckoo-shrikes to thrushes (J. del Hoyo, A. Elliott, and D. Sargatal, Editors). Lynx Edicions, Barcelona, Spain.

FRITTS, T. H. AND G. H. RODDA. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecology and Systematics 29:113–140.

HAWAI'I AUDUBON SOCIETY. 1989. Hawaii's birds. Hawai'i Audubon Society, Honolulu, USA.

ISLAM, K. AND R. N. WILLIAMS. 2000. Red-vented Bulbul (*Pycnonotus cafer*). The birds of North America. Number 520.

LINDSEY, G. D., E. A. VANDERWERF, H. BAKER, AND P. E. BAKER. 1998. Hawaii (*Hemignathus virens*), Kaua'i (*H. kauaiensis*), O'ahu (*H. chloris*) and Greater Amakihi (*H. sagittirostris*). The birds of North America. Number 360.

LOCKWOOD, J., M. HOOPES AND M. MARCHETTI. 2007. Invasion ecology. Blackwell Publications, Boston, Massachusetts, USA.

LONG, J. L. 1981. Introduced birds of the world. Universe Books, New York, USA.

NEWMAN, J. R., C. M. NEWMAN, J. R. LINDSAY, B. MERCHANT, M. L. AVERY, AND S. PRUETT-JONES. 2008. Monk Parakeets: an expanding problem on power lines and other electrical utility structures. Pages 355–363 *in* Environmental concerns in rights-of-way management, Eighth International Symposium (J. W. Goodrich-Mahoney, L. Abrahamson, J. Ballard, and S. Tikalsky, Editors). Electric Power Research Institute, Palo Alto, California, USA.

PERNETTA, J. C. AND D. WATLING. 1978. The introduced and native terrestrial vertebrates of Fiji. Pacific Science 32:223–244.

VANDERWERF, E. A. 1998. Elepaio (*Chasiempis sandwichensis*). The birds of North America. Number 344.

WATLING, D. 1977. The ecology of the Red-vented Bulbul in Fiji. Thesis. University of Cambridge, Cambridge, United Kingdom.

WILLIAMS, R. N. 1983. Bulbul introductions on Oahu. Elepaio 43:89–90.

WILLIAMS, R. N. 1987. Alien birds on Oahu: 1944–1985. Elepaio 47:87–92.

WILLIAMS, R. N. AND L. V. GIDDINGS. 1984. Differential range expansion and population growth of bulbuls in Hawaii. Wilson Bulletin 96:647–655.