trees suitable for nesting, including former nest trees. This encroachment by Pileateds and other woodpeckers has often been associated with cavity trees that are near bottomland habitats. Colony 2 is adjacent to hardwood stream-river bottoms, and both Colonies 2 and 3 are surrounded by mature mesic forest.

Many mature pines, primarily Loblolly, occur at each of the three colonies, and have dbh, height, and age characteristics similar to those of the cavity trees (Tables 1-3). Small cleared areas around cavity trees have not prevented competition by Pileateds and other woodpeckers, and these species have usurped Red-cockaded Woodpecker use at many cavity trees. Consequently, all hardwood brush, sawtimber, and pulpwood were removed in 1984 at all three colonies. In addition, pine sawtimber and pulpwood were removed in 1984, and the basal area of pine was reduced to 21.4 to 24.4 m^2 as recommended in the Red-cockaded Woodpecker Recovery Plan. Future plans entail continued control of hardwoods by removal and by summer burning (after mid-July). It is hoped that proper management of habitat for the Red-cockaded Woodpecker will alleviate woodpecker competition at cavity trees and allow reuse of pines or use of new pine trees by the few remaining Red-cockaded Woodpeckers.

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Heterospecific Vocal Mimicry by Blue-gray Gnatcatchers

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Bent (1949) quoted Pickens who stated that the Blue-gray Gnatcatcher (*Polioptila caerulea*) has "decided powers of mimicry," imitates in "almost whispering tones," and may be called the "Little Mockingbird." Fehon (1955) stated "Gnatcatchers are good mimics and the notes of ten other species were recognized." Root (1969) did not state that the Blue-gray Gnatcatcher mimics but mentioned its territorial song, which is sometimes whispered, included "long rambling series of warbles, whistles, and calls which are commonly assumed to function as the Gnatcatcher's song." Root noted this whispered song is associated with courtship activities. Kroodsma and Baylis (1982) did not list the Blue-gray Gnatcatcher as a heterospecific vocal mimic in their comprehensive

review on vocal learning in birds, apparently because the accounts in Bent (1949) and Fehon (1955) were overlooked and unsupported by other evidence.

I have qualitative incidental observations of heterospecific vocal mimicry by Blue-gray Gnatcatchers from three states, Massachusetts, North Carolina, and South Carolina, with some details from the last state. Two pairs in 1982 and 1983 and one pair in 1984 had their territories in at least some portion of my yard in Six Mile, Pickens County, S.C. My yard was the center of one territory in each of the 3 years. On arrival in late March, males sang and established and patrolled their territories, often accompanied by their females as described by Root (1969). Song was delivered from many conspicuous and inconspicuous perches, most frequently from middle heights (3-9 m) in both deciduous and coniferous trees and adjacent open woodlands in upland habitat. The territorial song usually consisted of short, sibilant phrases and thin, wiry notes and was sung at normal volume or *sotto voce*. Singing bouts usually lasted 10 seconds to 5 minutes; brief bouts are much more common as males frequently shifted perches in the same tree or flew to different trees while patrolling territories (Root 1969). Song occasionally occurred during undulating flights between trees or shrubs. Territorial song declined in frequency once incubation began, as reported by Fehon (1955) and Root (1969).

The mimic territorial song of the Blue-gray Gnatcatcher occurred under the same circumstances as above, and consisted of territorial and nonterritorial songs and calls of other species incorporated in the gnatcatcher's song. Each mimetic element (i.e. song, part thereof, or call) was usually sung once without repetition. Mimetic elements may be sung consecutively with very brief pauses between elements, though elements of the gnatcatcher's own song or calls were always interspersed in the mimicked version of the territorial song. The tonal quality of the mimicked notes usually was not comparable to the model, but I have recognized mimicry of about 30 species that are sympatric with the Blue-gray Gnatcatcher. Examples of songs and calls mimicked, following the terminology of Terres (1980), were the "wheeeep" call of the Great Crested Flycatcher (*Myiarchus crinitus*), the "tea-kettle" element of the song of the Carolina Wren (*Thyrothorus ludovicianus*), the "mew" call of the Gray Catbird (*Dumetella carolinensis*), and elements from the song of the American Goldfinch (*Carduelis tristis*). The mimic territorial song was given throughout the day, but was most frequent from 30 minutes before sunrise to 90 minutes after sunrise. This is similar to the timing of whispered territorial song described by Root (1969). During the hour before sunrise and occasionally afterwards, gnatcatchers often sang completely hidden from view within a tree; in particular, individuals often sang *sotto voce* from within a 5-m Red Cedar (*Juniperus virginiana*).

Neighboring pairs or threesomes (two males and a female) often interacted as a loose group during courtship periods. Intraspecific agonistic interactions observed among males were countersinging and displacement of one male by another. Bouts of countersinging did involve use of the mimic territorial song. Both of the above behavioral patterns were also seen in a group of five birds (three males, two females) in deciduous and Red Cedar scrub on 19 March 1984 in Charleston County, S.C. The breeding status of these birds was unknown.

The qualitative evidence cited herein suggests that heterospecific vocal mimicry in the Blue-gray Gnatcatcher functions intraspecifically. Mimicry was most intense during the courtship period when males patrolled prospective or established territories and when

females frequently followed males. Countersinging and physical displacement among males was also most frequent during this period, as reported by Fehon (1955). I suggest that these behavior patterns are related to mate choice and intrasexual competition among males, both attributes of sexual selection. No other correlations with mimicry, either ecological or behavioral, could be discerned.

In summary, my observations of heterospecific vocal mimicry in the territorial song of Blue-gray Gnatcatchers support Bent's (1949) quotation of Pickens and the observations of Fehon (1955), are consistent with singing behavior described by Root (1969), and indicate that mimicry is widespread and "persistent" (i.e. most or all individuals probably mimic regularly; Baylis 1982).

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