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BREEDING POPULATION OF SOUTHEASTERN AMERICAN KESTRELS IN TUBULAR CROSS-ARMED TRANSMISSION TOWERS IN SOUTH-CENTRAL GEORGIA

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The American Kestrel (*Falco sparverius*) is found in grasslands, open pastures, meadows, and sandhills in Canada and the United States. However, the Southeastern American Kestrel subspecies, *F. s. paulus*, which has declined by more than 80% over much of its range in Florida (Hoffman and Collopy 1988), is restricted to the southeastern United States (Smallwood and Bird 2002). Earlier studies had shown populations of southeastern kestrels in southern Georgia to be exceptionally local and small (Breen and Parrish 1995, Breen et al. 1995, Breen and Parrish 1997). The Southeastern American Kestrel is considered a species of special concern in Florida (Smallwood and Bird 2002), and Alabama (Mirarchi 2004), and was recently listed in Georgia, as well (Georgia DNR 2008). *Falco s. paulus* is a permanent, nonmigratory resident of the southeast, whereas the nominate race (*F. s. sparverius*) is migratory, and winters in the southeast, but nests only in the upper mountain regions of Georgia (Beaton et al. 2003, Parrish et al. 2006, Parrish 2007) and elsewhere in the U.S. and Canada (Smallwood and Bird 2002). Kestrels are obligate secondary cavity nesters, and the lack of natural cavities in Georgia appears to be the major factor limiting their success in the state, as well as in the rest of the southeastern U.S. We have documented increases in the number of southeastern kestrel young produced over the past 15 yr (1993–2007) of a nest-box study in the Coastal Plain of Georgia, with increases from only three young fledged the first year, to 49 fledged the second year, and an average of nearly 100 nestlings produced each of the past 8 yr as a result of both an increase in the number of available nest boxes, and an increase in the number of kestrels using our nest boxes (Breen and Parrish 1997, Parrish 2007).

We previously reported a large number of kestrels nesting in the hollow, tubular cross-arms of 230-kV electrical transmission towers in south-central Georgia in 2003 and 2004 (Fig. 1, Snow and Parrish 2002, Maney and Parrish 2007). Based on these observations it was apparent that those nest sites contained the single largest population of Southeastern American Kestrels in Georgia, as well as all of southeastern United States, with the exception of Florida (Smallwood and Collopy 1993). The present study was undertaken to further assess the stability of kestrel nesting activity in those unusual electrical transmission towers in south-central Georgia, and to determine kestrel use of alternative nesting sites that were placed on nontubular cross-armed transmission towers along this transect.

STUDY AREA AND METHODS

Study Area. The study was conducted along a transect of H-shaped, 230-kV transmission towers (Fig. 1) that extends from Offerman (Pierce County) in the east (31°27′32″N, 82°08′53″W) to Plant Mitchell (Dougherty County) in the west (31°26′38″N, 82°08′53″W), near Putney. Nearly 80% (368 of 471) of the transmission towers along this approximately 180-km transect possess tubular cross-arms, and thus are potential nest sites for the kestrels. The transects of transmission towers on both the eastern and western ends (ca. 35 km each) consist of a single 230-kV line, with a 30-m right-of-way (ROW), whereas the middle section of transmission towers (ca. 110 km) has a second, nontubular power line that runs parallel to the tubular cross-armed towers, creating a ROW of about 60 m wide. Sixty-six of the 93 transmission towers on the east end, and 82 of the 94 towers on the west end have tubular cross-arms, which could be used by kestrels. Almost 78% of the transmission towers (220 of 284) are available as possible kestrel nest sites in the middle section of the transect. There are 334 towers between Offerman and Tifton (numbered 334E–1E) and 137 towers from Tifton to Plant Mitchell, near Putney, GA (numbered 137W–1W).

Monitoring of Transmission Towers. The transmission towers were visited at least once each month from March through August, in 2005, and twice per month from March through August in 2006. A spotting scope (15–45×, 60 mm) was used to observe each tubular cross-armed transmission tower. During each visit, we recorded the sex and total number of kestrels observed perched either on a usable tower or on the suspension lines between each of two towers. We noted when adult kestrels were observed copulating, when males were seen carrying food to adult females, when adults were observed entering the ends of the tubular cross-arms during incubation or with food for the nestlings, and when hatching-year (HY) juveniles were observed near the towers after fledging, especially in 2006 when more visits occurred.

Placement and Monitoring of Alternative Nest Site Structures. Construction requirements by the electrical company maintaining the transmission lines necessitated the removal of the tubular cross-arms at transmission tower

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