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Daily movements of Northern Bobwhite broods in southern Texas.—Understanding the potential mobility of individuals is important when describing the spatial distribution of a species' habitat components. Information concerning the daily movements of Northern Bobwhite (*Colinus virginianus*) broods is lacking, making descriptions of optimum brood habitat difficult. We here present information on daily home ranges and minimum distances traveled of radio-marked Northern Bobwhite broods in southern Texas.

Study area and methods.—We conducted field work from March through August 1989 and 1990 on the Zachry Randado Ranch in Jim Hogg and Zapata counties, Texas. The dominant plant community on the ranch was mesquite (*Prosopis glandulosa*)-mixed brush (Drawe and Higginbotham 1980). Annual precipitation in the area averages 58.2 cm and summer temperatures are high (July mean is 31°C) (N.O.A.A. 1989–1990).

Adult bobwhite were captured with grain sorghum-baited funnel traps (Wilbur 1967) during March and April. Captured females were fitted with backpack-mounted radio transmitters (Marshall and Kupa 1963) weighing either 4.3 or 8.5 g in 1989 and 4.3 g in 1990. Radio-marked females were located 2–6 times/week, and consecutive identical location estimates identified hens that were incubating.

If a radio-marked female hatched at least one egg, we waited until chicks were 3–6 days old before monitoring the brood. Thereafter, we obtained one location series/week for broods until they reached six weeks of age. A location series consisted of five location estimates/day, with one location each during 03:00–06:00, 08:00–09:30, 12:00–14:00, 18:00–20:00, and 22:00–23:00 CST. We estimated brood locations by approaching within approximately 30 m of the radio-marked female and then partially circling its estimated location (White and Garrott 1990:42). Location estimates were plotted on an aerial photograph of the study area (scale 1:4800).

We examined night roost sites to learn if radio-marked females and their chicks became separated. If no chick feces were found at the sites, separation was confirmed by flushing females and directly observing chicks or if hens exhibited brood-tending behavior (short, fluttering flight and excited calling).

Minimum daily distances moved by broods were estimated by adding the distances between the five location estimates in a daily series. Daily home ranges were calculated using the minimum convex polygon method (Hayne 1949) using program HOME RANGE (Samuel et al. 1985). We compared means of movement variables for ≤2-week-old broods (prefledging) with those for ≥three-week-old young (postfledging) using Wilcoxon tests (Zar 1984:139). We used a $P \leq 0.1$ significance level to discern differences between means.

Results.—Sixteen daily location series were analyzed for five broods (1–5 series/brood). Mean home ranges ($P = 0.072$) and distances traveled ($P = 0.020$) differed with brood age. Daily home ranges and minimum distances traveled averaged 0.7 ± 0.4 ha (±SE) and 277 ± 65 m, respectively, for prefledging broods (N = 7). These variables averaged 1.4 ± 0.4 ha (N = 9) and 589 ± 74 m, respectively, for postfledging broods.

Discussion.—Lehmann (1984:106) hypothesized that Northern Bobwhite broods moved "no farther than necessary to find satisfactory accommodations," but did not attempt to quantify movements. Bell et al. (1985) reported daily distances traveled by adult bobwhites in Louisiana averaged 370 m in spring, which is generally less than the broods we studied traveled when they were > one week old. This discrepancy may be because we used five radiolocations for distance estimation rather than the three used by Bell et al. Crim and Seitz (1972) found daily ranges of adult bobwhites of both sexes averaged 1.6 ha, which is approximately equal to our ≥three-week-old daily brood ranges.

The positive association between brood age and movements is similar to that reported for Ring-necked Pheasants (*Phasianus colchicus*) (Warner 1984) and Gray Partridges (*Perdix perdix*) (Church 1980). Warner (1984) also found that pheasant broods moved less in fine-grained than in coarse-grained landscapes. Habitat types (e.g., brush and herbaceous vegetation) on our study area were well interspersed (i.e., distances from any point on our study area to a mature brush-herbaceous vegetation edge were generally <125 m). Thus, if this association is also valid for Northern Bobwhites, we would expect movements of the broods we studied to be small relative to those of broods in areas where habitat types are less interspersed (e.g., cropland).

Our data lacked spatial and, to a lesser extent, temporal replication. Future research on Northern Bobwhites should describe brood movements in other regions and landscape patterns within the species' range.

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Correlation between raptor and songbird numbers at a migratory stopover site.—Certain landscape features, such as coastlines, often concentrate raptors during their migration (Mueller and Berger 1967, Dunne and Clark 1977, Bednarz et al. 1990). A number of falconiform species that cross the Gulf of Mexico during both the spring and fall migrations have been seen on the barrier islands that parallel the northern Gulf of Mexico (Moore et al. 1990). These islands are important stopover areas for migrating songbirds (Moore and Kerlinger 1987) because they represent their first opportunity to rest and replenish depleted fat stores following trans-Gulf flight. The islands may also be important for migrating hawks by virtue of the concentration of songbird migrants (Kerlinger 1989). Passerine migrants are an important resource for raptors during migration, and migrating raptors have been observed hunting at stopover sites (Hunt and Ward 1988, Lindström 1989, Moore et al. 1990).

I examined the co-occurrence of raptors and songbirds during migration by observing the passage and behavior of raptors at a migratory stopover site. The work was conducted on East Ship Island (ESI), a barrier island which lies approximately 19 km from the Mississippi coast (see Kuenzi et al. 1991), between 2 April and 6 May 1991. Although the focus of research on the island was the stopover ecology of songbirds, I and three field assistants noted the presence and behavior of raptors throughout the daylight hours. We identified the species, whether or not it was flying (an indicator of predatory activity), any attacks on migrants, and evidence of feeding on migrants. Some individual raptors may have been counted more than once as the raptors were not marked.

We counted 50 Merlin (*Falco columbarius*) and 55 Peregrine Falcon (*F. peregrinus*) observations. Five American Kestrels (*F. sparverius*) and three Swallow-tailed Kites (*Elanoides forficatus*) were also seen, but their numbers do not permit statistical analysis. Falcon sight-