

## SITE FIDELITY OF WINTERING HENSLOW'S SPARROWS

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**Abstract.**—Little is known about the winter biology of many grassland bird species or about how alteration of winter habitat might be affecting populations. Therefore, we examined between-year and within-year winter site fidelity of the Henslow's Sparrow (*Ammodramus henslowii*) in Baldwin County, Alabama. In 1995, we banded 22 Henslow's Sparrows. In 1996, we banded 30 Henslow's Sparrows and recaptured 13 individuals a total of 20 times. All birds were recaptured in the site where they were originally banded. No movement between sites was detected. No birds banded in 1995 were recaptured in 1996. Our data suggest that Henslow's Sparrows tend to be site faithful within a winter, but not from one year to the next.

### FIDELIDAD DE INDIVIDUOS INVERNALES DE *AMMODRAMUS HENSLOWII*

**Sinopsis.**—Se conoce muy poco sobre la biología invernal de aves que habitan en yerbasales o de como la alteración del hábitat invernal afecta las poblaciones de éstos. Examinamos, dentro de un mismo año y entre años, la fidelidad por localidades del gorrión *Ammodramus henslowii* en un estudio que llevamos a cabo en el condado de Baldwin, Alabama. Durante el 1995, anillamos a 22 de estas aves. En el 1996 a 30 aves, y recapturamos a 13 de éstos en 20 ocasiones. Todas las aves fueron recapturadas en las localidades en donde fueron capturados originalmente. No se encontró movimiento entre localidades. Ninguna de las aves anilladas en el 1995 fue recapturada en el 1996. Nuestros datos sugieren que el gorrión estudiado tiende a guardar fidelidad por las áreas en donde pasa el invierno durante una misma temporada pero no así de un año para otro.

Winter site fidelity has been documented in many species of passerines. White-throated Sparrows (*Zonotrichia albicollis*) (Piper 1990, Piper and Wiley 1990), American Redstarts (*Setophaga ruticilla*), Black-throated Blue Warblers (*Dendroica caerulescens*) (Sherry and Holmes 1996), and Northern Waterthrushes (*Seiurus noveboracensis*) (Snow and Snow 1960), among other species of neotropical migrants, not only seem to remain in specific areas throughout the winter, but also return to those areas in consecutive years (McNeil 1982, Nickell 1968). Individual White-throated Sparrows even have home ranges of similar size in consecutive years (Piper 1990). Site fidelity offers advantages to individuals wintering in areas where resources are plentiful (Sherry and Holmes 1996). Correlations

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have been observed between site fidelity and dominance, subcutaneous fat levels, birds inhabiting certain areas within a study site (Piper and Wiley 1990), and areas with abundant resources (Sherry and Holmes 1996).

There is virtually no information regarding winter site fidelity in any of North America's grassland sparrow species, even though declines in many populations illustrate the need for such information (Askins 1993). Therefore, we examined winter site fidelity of the Henslow's Sparrow (*Ammodramus henslowii*), a short-distance migrant that breeds and winters in grasslands in eastern North America (Askins 1993, Herkert 1994, Hyde 1939, Robins 1971, Zimmerman 1988). Henslow's Sparrow populations have declined since the 1960s. Between 1980 and 1994, estimated annual declines range from 11%–22% (Askins 1993, Pruitt 1996, Tate 1981). In an effort to learn more about the winter biology of the Henslow's Sparrow, we examined winter site fidelity on lands intensively managed for timber production in 1995 and 1996. The objectives of our study were to determine if Henslow's Sparrows remain at a particular location within the same winter and to determine if Henslow's Sparrows return to those areas from one year to the next.

#### STUDY SITE AND METHODS

Our study area was located in Baldwin County, Alabama. International Paper Company intensively manages this area for timber production. Loblolly Pine (*Pinus taeda*) is most commonly planted, along with a few stands of Longleaf Pine (*Pinus palustris*). Trees are harvested in 25–30-yr rotations. After a stand is harvested, the site is prepared for replanting by burning the slash and bedding the area if the soil is moist or wet. Herbicides are sometimes used (Walter Dennis, International Paper Company, pers. comm.). We captured Henslow's Sparrows using mist nets and placed a U.S. Fish and Wildlife Service aluminum band on each bird. Sites were chosen by using information on Henslow Sparrow densities collected in a concurrent study on winter habitat selection. Sites with the highest densities of sparrows were used to maximize the number of birds captured. During the 1995 season, birds were banded in 10 sites between 28 February and 13 March. During 1996, birds were banded in nine sites between 11 January and 13 March. Five of the 10 sites used in 1995 were also used in 1996; the other sites were disturbed for timber management and no longer provided suitable habitat for Henslow's Sparrows. No Henslow's Sparrows were detected in the five disturbed sites during multiple visits and three 30-min surveys done in the concurrent study. The sites with the highest densities of Henslow's Sparrows were primarily in areas that had been cut and/or burned the previous year (i.e., had been left undisturbed for one growing season).

Eight mist nets were placed along the edge of suitable habitat. We used two methods to capture birds. In 1995 we drove birds into the nets using varying numbers of people walking side by side, concentrating on Henslow's Sparrows when they were flushed. In February 1996, on sites with few or no trees, we began capturing Henslow's Sparrows by dragging a

weighted rope between two people while moving towards the nets. This method made it possible for 2 people to thoroughly sample areas of 1–2 ha. The number of people participating and the amount of time spent at each site was recorded. Because of the different methods of capture and varying numbers of people involved, using standard net hours as a measurement of effort is useless. Because the same number of mist nets were used each time we trapped both years, our effort is reported in number of hours spent trapping without regard to the number of nets used. In 1995, we trapped a total of 21.5 h. In 1996, we trapped a total of 46.75 h. The normal approximation to the Mann-Whitney test (Zar 1984) was used to compare the mean date of capture for individuals that were recaptured versus those that were not recaptured. Only birds recaptured on the next visit were used in the analysis (i.e., birds recaptured on later visits were omitted). Individuals with no chance of being recaptured (i.e., habitat was not resampled after they were banded) also were omitted. This way all birds were equally likely to be recaptured.

#### RESULTS

During our first season, 22 Henslow's Sparrows were banded. We netted only once in seven of the sites and twice in the remaining three sites. No individuals were recaptured in 1995. In 1996, 30 Henslow's Sparrows were captured on four of the original ten sites and four additional sites that were not used in 1995 because they just been clear-cut and lacked adequate ground cover. Five of the six original sites without Henslow's Sparrows had been physically altered by timber management practices and no longer provided suitable habitat for the species. Thirteen individuals were recaptured a total of 20 times. No birds banded in 1995 were recaptured in 1996. All recaptures occurred in the site where the bird was originally banded. No movement was observed between sites, even though four areas were separated by less than 3 km. Six individuals were captured at least three times at the same site over periods of 24–61 d (Fig. 1). Three others were captured twice at the same site 20–43 d after initial capture (Fig. 1). The four remaining individuals were banded and recaptured within 7 d of initial capture.

Individuals that were recaptured on the subsequent visit to the site tended to be banded earlier in the season than those not recaptured ( $Z = 2.31$ ;  $P = 0.021$ ;  $n = 25$ ). The proportion of birds recaptured on the subsequent visit to the site was approximately 50% from January 12 (our first day banding) to mid-February and decreased to approximately 36% from mid-February to early March.

#### DISCUSSION

Our data suggest that Henslow's Sparrows are site faithful within the same season. Of the 30 birds banded in 1996, almost one half were recaptured at least once in the same site, and none were recaptured in different sites. If there were no site fidelity, we would have expected to catch a few birds in nearby sites that provide suitable habitat. Seventeen

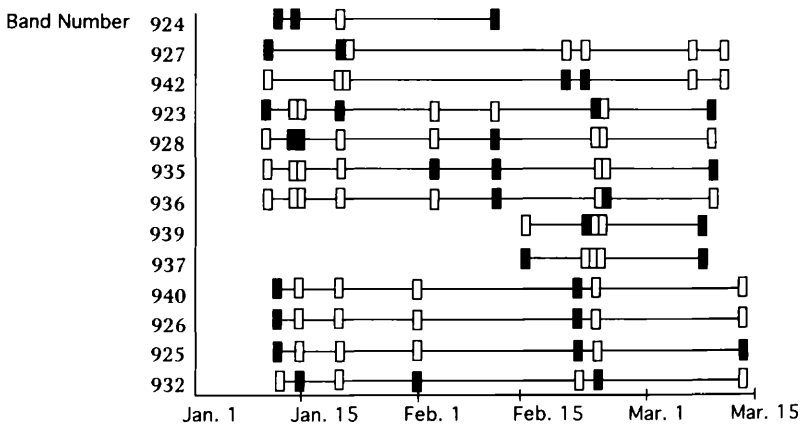


FIGURE 1. Capture histories of 13 Henslow's Sparrows at five sites in Baldwin County, Alabama. Rectangles represent banding visits to the site. Shaded rectangles show visits on which the bird was captured; unshaded rectangles show visits on which the individual was not captured. All birds were recaptured at the site where they were initially banded.

birds were not recaptured. Eleven of those birds were caught after 23 February. Birds were more likely to be recaptured on the subsequent visit to the site if they were caught earlier in the season. In late February of both years we observed Henslow's Sparrows in areas that were not occupied from early January to mid-February. An increase in the number of unbanded birds initially captured near the end of the season could be attributed to an influx of birds from outside of our study site, possibly associated with the onset of migration.

Species of birds that show strong site fidelity between years, such as White-crowned Sparrows and several species of Parulid warblers (Piper 1990, Piper and Wiley 1990, Nickell 1968, McNeil 1982, Snow and Snow 1960), occupy habitat that changes little from one year to the next. Our limited data suggest that Henslow's Sparrows were not site faithful from one winter to the next on our sites. Of 22 birds banded in 1995, 54% were caught in areas no longer providing suitable habitat in 1996, therefore greatly reducing our chances of collecting data supporting site fidelity. However, information gathered during the breeding season also indicates a lack of between-year site fidelity (Pruitt 1996). The Henslow's Sparrow is, and apparently always has been, a species of ephemeral habitats maintained by fire occurring at approximately 3–5-yr intervals (Clewell 1981, Horton 1995, Platt et al. 1988, Robbins and Meyers 1992, Waldrop et al. 1992). The life-span of an individual sparrow is likely greater than the period of time in which any particular area provides suitable habitat. This means that if Henslow's Sparrows were site faithful between years, every few years, their site would not provide adequate habitat due to fire disturbance. To survive, Henslow's Sparrows probably must be able to find new patches of suitable habitat between years. Under such con-

ditions one would not expect to see strong between-year site fidelity. From a management standpoint, disturbances such as the harvest of trees and prescribed burns that occur during the winter could be harmful to Henslow's Sparrows by forcing individuals to move once they have established a winter home range. However, these same areas could result in improved habitat in subsequent years.

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