MOVEMENTS OF HOUSE SPARROWS CAPTURED AT AN EXPERIMENTAL GRAIN STATION IN FARGO, NORTH DAKOTA

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Abstract: From 2 August through 1 October 1993 we banded and leg flagged 362 house sparrows (126 adults, 236 juveniles) captured in a decoy trap at an experimental grain station on the campus of North Dakota State University, Fargo (NDSU). We documented sightings of leg-flagged birds between 3 August 1993 and 14 December 1994. Over this period, 56 (66%) of the total 76 observations of leg-flagged birds were on the NDSU campus; 21 (28%) of the 76 observations occurred between March and December 1994, a minimum of 5 months after the leg flags were attached and following the 1993-1994 winter. Of the 21 observations in 1994, 16 (76%) occurred on campus. The farthest sighting of a leg-flagged bird was 6.5 km (4 mi.) from the trap site. The data indicated that we captured and marked a localized population. A concerted effort based on trapping could reduce house sparrow damage on the small, experimental plots of cereal grains and sunflower grown at the station.

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Key words: birds, damage, decoy traps, experimental crops, leg-flags, movements, *Passer domesticus.*

House sparrows (*Passer domesticus*) were established in North America through multiple introductions in the mid- to late 1800s. Although the population has declined significantly since its peak of 150 million in the 1930s and 1940s, house sparrows still remain among the 10 most counted species on the North American Breeding Bird Survey. They ranked 7th in total counts on all U.S. routes in 2005 (USGS-PWRC 2007). Usually considered a minor "nuisance" species, they occasionally become a serious problem in urban and agricultural settings (Fitzwater 1994). In late summer they gather in large flocks and feed heavily on maturing cereal grains and sunflower (Wiens and Dyer 1977, Summers-Smith 1988). Damage is usually confined to field edges and is often slight; however, when the damage occurs on experimental crops it is exacerbated because the crops are small and have significant multi-year investments in genetic research and development

(Royall 1969). House sparrows are non-migratory with limited natal dispersal (Lowther 1979, Fleischer et al. 1984, Summers-Smith 1988). Thus, it is conceivable that house sparrow populations could be effectively managed by live trapping (Royall 1969). Trapping efficacy depends on the magnitude of local movements and dispersal of the targeted population. We investigated movements of house sparrows captured in 1993 at an experimental grain station on the campus of North Dakota State University, Fargo (NDSU). Plots of experimental cereal grains and sunflower, which had been grown on the campus site for several years, were being damaged by house sparrows.

METHODS

We captured the birds using a modified Australian crow trap (*see* Royall 1969) run continuously from 2 August to 1 October 1993 (60 trap days). We moved the trap once from its initial site by a barley field to a sunflower field because house sparrows reduced their use of the barley field soon after it was harvested. The trap was always placed at the edges of the fields. We prebaited the trap site with bird food (a mixture of sunflower meats, brown rice, and cracked corn) for 2 days before placing the trap. We allowed the birds to use the trap freely for 2 days by leaving the entry door open. The trap itself and the area immediately surrounding the trap were baited daily with fresh bird food (300 g, 10 oz.). The trap was also equipped with perches, shade covering, and water troughs. To increase the effectiveness of the trap, 4 house sparrows were used as trap decoys. We checked the trap in the morning and afternoon to replace food and water and process newly captured birds. The captured birds were leg tagged with a green-colored 1.2 x 4.0-cm (0.5 x 1.5 in.) strip of fabric and released immediately at the site. The flagging was attached around the bird's right leg with 2 nylon fasteners (Cummings 1986). A U.S. Fish & Wildlife Service aluminum band was placed on the left leg. In addition to using our own observations for resighting marked birds, we distributed handbills and used The Fargo Forum, a daily newspaper, to notify the public and provide instruction for reporting observations to the lead author (LMM).

In an attempt to recapture birds that had been caught and marked in 1993, we also trapped in 1994 in the same vicinity of the 1993 trap site. Although we observed 2 birds marked in 1993 by the trap, none were captured in 1994 (n = 175; 45 adults, 130 juveniles; 28 trap days from 9 August to 6 September 1994). The birds captured in 1994 were also leg flagged, but with a different color than used in 1993. We did not record sightings of leg-flagged birds marked in 1994.

RESULTS

In 1993 we banded and leg flagged 362 house sparrows (126 adults, 236 juveniles). The first house sparrow captured was on 2 August and the last on 14 September. We made 68 recaptures, with some individuals recaptured several times. Sightings of leg flags were reported from 3 August 1993 until 14 December 1994, approximately 2 weeks before we concluded data collection for the study. Over this period we had 76 sightings with the majority of these (n = 50, 66%) occurring on the NDSU campus. Twenty-one sightings occurred between March 1994 and December 1994 (i.e., following the 1993-1994 winter), representing 28% of the total number of observations; 16 (76%) were on the NDSU campus. The farthest sighting of a leg-flagged bird was 6.5 km (4 miles) from the campus.

DISCUSSION

Previous studies have shown that during winter house sparrows rarely travel more than 6 km (3.6 mi.) to reach food sources (Weaver 1939), and most house sparrows will spend their lives within 4 km (2.5 mi.) of their natal sites. None of the leg-flagged birds were observed beyond 6.5-km (4 mi.) from the trap site, which supports the earlier results of Weaver (1939) showing that house sparrows have a limited range. The media outlet that we used to notify the public had a broad distribution, both within Fargo and in the communities surrounding Fargo, thus we believe that the 6.5-km radius encompassed a large proportion of the leg-marked population. Numerous sightings of leg flags in 1994 indicated that the marked house sparrows were apparently able to find suitable feeding and roosting sites that allowed their survival during fall and winter in Fargo.

Decoy traps placed at the experimental field plots on the NDSU campus should reduce damage to the plots because the house sparrow population is localized (Royall 1969). In 1993, we were able to catch over 300 house sparrows (excluding recaptures) with one trap. We periodically counted house sparrows in the experimental plots during August 1993 and found a peak number of 1,750. Thus, our single-trap effort in 1993 captured 17% of the peak count; most of the captures were juveniles. The proportion of juveniles captured in 1993 was 0.65; in 1994 it was 0.74. These proportions were close to what would be expected in the at-large population, according to an estimate of 5.75 fledglings per breeding pair per season (Singer and Yom-Tov 1988).

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Cover: on the left a white-lined sphinx moth pollinating purple loosestrife (an invasive species); on the right is a clear-wing moth pollinating a gayfeather (a native to North American prairies). Artwork by Rick Simonson.