nests. Homing experiments (Griffin, Auk 57:61–74, 1940; Billings, Auk 85:36–43, 1968) disclose that Leach's Storm Petrels have the ability to return to Kent Island from release points hundreds or thousands of kilometers away. These release points must be far beyond the range of colony odor. Navigation must be based on senses other than olfaction, therefore, until the petrels get within the general vicinity of their breeding island. The use of olfactory cues, suggested by the upwind approach patterns to Kent Island, probably operates only within a few tens or perhaps hundreds of kilometers of the breeding site.

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Effects of highways on Red-winged Blackbird and Horned Lark populations.—Human disturbances that alter the distributions of wildlife populations through habitat modification are widespread. One example is highways, which directly affect wildlife populations in the right-of-way area, but may also have important effects in adjacent areas.

We conducted bird censuses along county roads and interstate highways in central Illinois during 1976 to test the efficacy of several census techniques. Transects perpendicular to the road, 100 m wide and 500 m long, were divided into 100 × 100 m blocks. Clusters of transects were located at random along interstate and county roads in Champaign County, Illinois. All transects discussed here were in fall-plowed fields planted to row crops (mostly corn and soybeans). Censuses were completed before crops matured. Census protocols included 4 and 8 min random walk and 4 min straight walk counts. For random walk counts the observer spent 4 or 8 min in each plot and walked throughout the plot as seemed appropriate to obtain a count of the birds. The observer walked the center line of the transect, spending 4 min in each plot, for straight walk counts. Transects did not include any pavement or gravel shoulder areas.

Census data are partitioned into 2 periods: late winter–early spring (10 Feb.–11 Apr.) and late spring (25 May–20 June). Census times were distributed from 30 min before to 4 h after sunrise. Eighty-six bird counts (62 early, 24 late) were made on 18 different county road transects and 69 (61 early, 8 late) were made on 15 different interstate highway transects. The same census technique was used on all plots within a transect on a given day and separate records were kept of each of the 5 1-ha blocks along the transect. Thus, comparisons of data from blocks at different distances from the highway yield some insight into the effect of highways on bird distributions.

Although data were collected on a number of species, only Horned Larks (*Eremophila alpestris*) and Red-winged Blackbirds (*Agelaius phoeniceus*) were common enough to

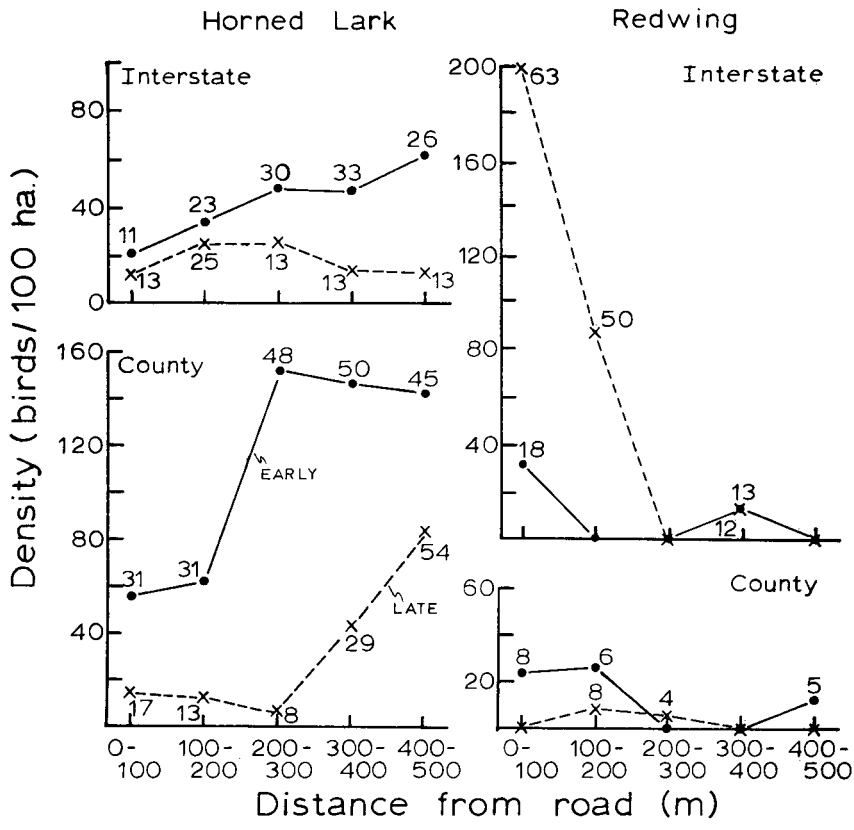

FIG. 1. Mean densities of Horned Lark and Red-winged Blackbird at varying distances from interstate and county highways in Illinois. Numbers indicate proportion of censuses that contained the species. Early censuses—10 Feb. to 11 Apr.; Late censuses—25 May to 20 June.

yield data sufficient for discussion here. Horned Larks, permanent residents in east-central Illinois, were observed throughout the study period. Migrating red-wings first arrived on 25 February.

Horned Lark densities increased with distance from the road for both county and interstate highways during the early census period and along county roads during the late census period; densities were generally higher along county than along interstate highways (Fig. 1).

Red-wing densities during the early census periods were generally low, with most birds observed near highways. During the late census period red-wings were very abundant in plots adjacent to interstate highways but rare or absent from distant interstate plots and throughout county road transects. The proportion of plots occupied

by each species also varied considerably with road type and distance from the road (Fig. 1). (Two large, migrating flocks of red-wings found in the 400–500 m distance range were not included in Fig. 1.) The increased abundance of red-wings near interstate highways was associated with the wide right-of-way which included 10–15 m of bluegrass (*Poa pratensis*), often with shrubs or small trees.

In central Illinois, as in much of the midwest, most privately owned land is intensely cultivated. Nesting success of red-wings is partially determined by the availability of sturdy nest support sites early in the year (Orians, Ecol. Monogr. 31:285–312, 1961; Goddard and Board, Wilson Bull. 79:283–289, 1967), and although row crops probably are excellent feeding grounds for blackbirds, they certainly do not provide suitable nest supports until late in the year. The existence of right-of-way zones with extensive grass habitat and scattered shrubs should enhance nesting success and increase population density of red-wings. Water did not seem to be a factor, as our roadside transects did not include areas of water, even adjacent to interstates. Observed variation in density is consistent with this expectation. Uncultivated land adjacent to county roads is often no more than 2–3 m wide and is less likely to provide suitable nest supports, and populations of red-wings along county roads were much lower than along interstate highways.

The Horned Lark nests on bare ground, and cultivation of land formerly heavily vegetated has allowed this species to increase in numbers (Graber and Graber, Bull. Ill. Nat. Hist. Surv. 28(3):477–478, 504, 1963). Horned Larks seem to be most common in large expanses of open ground well away from other habitat types. This may account for low densities of Horned Larks in plots adjacent to highways. Alternatively, highway noise may affect them, perhaps by interfering with vocal communications. Our data do not allow testing of these hypotheses.

Data presented here demonstrate that highways affect abundance of bird species and that the effect varies with species, highway type, season, and distance from the highway. Future construction programs for highways should consider effects on wildlife, both in the immediate highway right-of-way and in areas at least up to 500 m from the right-of-way.

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Observations on Plush-capped Finches in the Andes with a description of the juvenal and immature plumages.—The Plush-capped Finch (*Catamblyrhynchus diadema*) remains today poorly known and of uncertain taxonomic status despite a relatively wide geographical range in the Andean highlands from Venezuela to Bolivia. The only published statements known to us regarding the behavior of this species are in Van Tyne and Berger (Fundamentals of Ornithology, John Wiley and Sons, 1976) from Jelski (*in* Taczanowski, Ornithologie du Pérou, Rennes, France, 3:25, 1886): "They are met with in isolated pairs or mingled with flocks of other birds," and Goodfellow (Ibis, 8th series, 1:473, 1901): "We found them [3 ♂ ♂] singly in the higher trees," and a brief account by Schafer and Phelps (Boletín de la Soc. Venez. de