

## GENERAL NOTES

**Grasshoppers and crickets eaten by Utah birds.**—Many species of Utah birds are decidedly insectivorous. Studies of a large number of stomachs from such birds have indicated that the vast majority of insects eaten were injurious. The following report is based on laboratory examinations of the contents of bird stomachs collected throughout Utah from 1935 to 1940, inclusive. Birds are definitely important in reducing insect populations, especially when insects occur in large numbers, as is the case in insect outbreaks. Assuming 2.5 birds per acre as an average for Utah (which is lower than many estimates would place the figure), an estimated population of 131,500,000 birds would exist in this state. Birds consume large amounts of food each day; they undoubtedly consume many billion injurious insects through the farm and range areas of Utah each year, with consequent benefit to farm crops, range forage and home gardens. While recognizing the benefits derived from the feeding of birds, it is difficult to estimate accurately the *degree of control* over a large area, which birds exert upon any particular insect pest. In general, the benefits derived from birds in the control of insects undoubtedly are many times the loss occasioned by the feeding of a few species which attack crops, fish or useful birds.

Brewster's Egret, *Egretta thula brewsteri*.—One stomach from a bird collected in the meadows at Logan, on September 6, 1940, contained twelve warrior grasshoppers, *Camnula pellucida*.

White-faced Glossy Ibis (*Plegadis guarauna*).—One specimen collected on meadows at Kaneshville, July 23, 1940, contained two adult grasshoppers and one field cricket.

Western Red-tailed Hawk (*Buteo borealis calurus*).—Of seven stomachs examined, four contained Orthoptera, totaling 56 adult grasshoppers and one sand cricket.

Northern Red-shouldered Hawk (*Buteo lineatus lineatus*).—One specimen, collected at Elgin, Utah, September 28, 1939, contained five adult grasshoppers. This is an unusual record for Utah.

Swainson's Hawk (*Buteo swainsoni*).—Four of the ten stomachs examined contained 77 adult grasshoppers; one bird collected at Benson, July 31, 1940, contained 68 of these.

Desert Sparrow Hawk (*Falco sparverius phalaena*).—This is the most abundant hawk occurring in Utah, more than a hundred having been observed in one day of field study on several occasions. An examination of 197 stomachs showed 2,699 Orthoptera still recognizable, besides large amounts of well-digested fragments consisting chiefly of grasshopper parts; 2,417 grasshoppers were still recognizable in 185 stomachs; 231 field crickets were contained in 49 stomachs; and 50 sand crickets in eight stomachs; one katydid also was present. Grasshopper counts were based on caudal ends of abdomens as more of these were recognized than were heads or other parts. Evidently this bird takes the abdomen from many grasshoppers not entirely consumed, especially in areas where grasshoppers are abundant and easily captured.

Sage Grouse (*Centrocercus urophasianus*).—Three were collected in Mormon cricket areas; one contained 35 and another four Mormon cricket eggs; the other contained one sand cricket.

Ring-necked Pheasant (*Phasianus colchicus torquatus*).—Of ten examined, eight contained grasshoppers in either crop or gizzard, the total number being 13; one was a nymph.

Killdeer (*Oxyechus vociferus vociferus*).—Of five stomachs examined, two contained a total of five adult grasshoppers.

Western Willet (*Catoptrophorus semipalmatus inornatus*).—The one specimen collected contained one grasshopper.

California Gull (*Larus californicus*).—One specimen was taken on Tintic Mountain in 1940 in an area where from a few hundred to an estimated 2,000 gulls frequently were observed to congregate and feed upon Mormon crickets; the stomach of this specimen contained twelve mature Mormon crickets which constituted 100 per cent of the contained food. This stomach was very large and distended, filling most of the abdominal cavity of the bird.

Road-runner (*Geococcyx californianus*).—One specimen was collected at St. George on September 18, 1935; it contained three adult grasshoppers.

Burrowing Owl (*Speotyto cunicularia hybugaea*).—One specimen collected at Midvale, Utah, October 11, 1936, contained one grasshopper and one mouse.

Pacific Nighthawk (*Chordeiles minor hesperis*).—Four stomachs were examined; one contained nine winged grasshoppers, of which two were *Trimeritropus caeruleipennis*, two were *Disosteira carolina* and one *Melanoplus femur-rubrum*.

Lewis's Woodpecker (*Asyndesmus lewis*).—Of five stomachs examined, one contained an adult grasshopper.

Eastern Kingbird (*Tyrannus tyrannus*).—Fourteen stomachs were examined, eight of which contained nine adult grasshoppers.

Arkansas Kingbird (*Tyrannus verticalis*).—An examination of 55 stomachs revealed that 48 of them contained 110 grasshoppers, of which 105 were adult; six stomachs contained eight field crickets.

Say's Phoebe (*Sayornis saya*).—Four of the seven stomachs examined contained nine adult grasshoppers.

Western Wood Pewee (*Myiochanes richardsoni richardsoni*).—Two of the three stomachs examined each contained one adult grasshopper.

Desert Horned Lark (*Otocoris alpestris leucolaema*).—Examination of 62 stomachs showed eight to contain 16 Orthoptera, 14 adult and one nymphal grasshopper and one sand cricket.

Barn Swallow (*Hirundo erythrogaster*).—Fifty-four stomachs examined contained two recognizable field crickets and one snowy tree-cricket.

American Magpie (*Pica pica hudsonia*).—Only one of 16 juvenile magpie stomachs examined contained a grasshopper.

American Raven (*Corvus corax sinuatus*).—Often seen to feed upon Mormon crickets in Tooele and Juab Counties during recent years.

Rock Wren (*Salpinctes obsoletus obsoletus*).—Of the seventy-four stomachs examined, thirty contained 59 grasshopper adults and one nymph.

Western Mockingbird (*Mimus polyglottos leucopterus*).—Two stomachs contained one nymphal and four adult grasshoppers.

Catbird (*Dumetella carolinensis*).—One of two stomachs collected at Hooper contained two grasshoppers.

Sage Thrasher (*Oreoscoptes montanus*).—Thirty-nine stomachs were examined, thirty-two of which contained 61 adult and six nymphal grasshoppers and five field crickets.

Western Robin (*Turdus migratorius propinquus*).—Eleven stomachs yielded three adult grasshoppers and one field cricket.

Mountain Bluebird (*Sialia currucoides*).—One hundred and fifty stomachs examined contained 142 Orthoptera; 92 adult and seven nymphal grasshoppers were in 62 stomachs; 43 field crickets in 20 stomachs.

American Pipit (*Anthus spinoletta rubescens*).—Twenty-one of the 78 stomachs examined contained 36 Orthoptera, all field crickets.

Nevada Shrike (*Lanius ludovicianus nevadensis*).—Twenty-six stomachs were examined, 21 of which contained 55 adult and two nymphal grasshoppers, four field crickets and one sand cricket.

Western Meadowlark (*Sturnella neglecta*).—Forty-four of the 83 stomachs contained Orthoptera, 39 containing 73 adult and 6 nymphal grasshoppers; five field crickets and one sand cricket also were present in the additional five stomachs.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).—Two of the twelve stomachs collected contained three grasshoppers.

Thick-billed Redwing (*Agelaius phoeniceus fortis*).—Fifty-seven stomachs contained six grasshoppers in five stomachs and two field crickets in another.

Brewer's Blackbird (*Euphagus cyanocephalus cyanocephalus*).—One-hundred-five stomachs were examined; 40 contained Orthoptera, including 51 adult and 9 nymphal grasshoppers in 30 stomachs; the other ten stomachs held 16 field crickets.

Bullock's Oriole (*Icterus bullocki bullocki*).—One of the three stomachs examined held an adult grasshopper, another a nymph.

House Finch (*Carpodacus mexicanus frontalis*).—Of the 32 stomachs examined only one contained an Orthopteron, a grasshopper.

Western Vesper Sparrow (*Pooecetes gramineus confinis*).—Twenty of the 68 stomachs contained 32 adult and three nymphal grasshoppers. Several birds were collected while they still held a grasshopper in their beaks.

Western Lark Sparrow (*Chondestes grammacus strigatus*).—Fourteen of 17 stomachs examined held 28 adult and 6 nymphal grasshoppers.

Sage Sparrow (*Amphispiza nevadensis nevadensis*).—Of sixteen birds collected, one contained four grasshoppers.

Western Chipping Sparrow (*Spizella passerina arizonae*).—Of 207 stomachs examined, 15 contained Orthoptera, consisting of 15 adult and 5 nymphal grasshoppers and one field cricket.

White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*).—One grasshopper nymph was the only Orthopteron in the 68 stomachs examined.

Gambel's Sparrow (*Zonotrichia leucophrys gambeli*).—Twenty-eight of the 92 stomachs examined contained a total of 37 Orthoptera, all adult grasshoppers.—G. F. KNOWLTON AND F. C. HARMSTON, *Department of Entomology, Utah State Agricultural College, Logan, Utah.*

**Altitudinal nesting and breeding-range extension of the Wood Thrush.**—During the past two decades, the Wood Thrush (*Hylocichla mustelina*) has gradually extended its former breeding range northward into the upper reaches of the Green Mountains in Vermont and, perhaps, the White Mountains. Apparently escaping the notice of American ornithologists, these birds have definitely established themselves as regular summer residents in certain localities of northern Vermont where, twenty-two years ago, they were relatively unknown. And, strangely enough, the Wood Thrush has, in many cases, 'reversed the poles' and taken to altitudinal nesting in the more northern portions of its range, whereas it is decidedly of lowland distribution throughout the remainder of its domain.

During the latter weeks of June, 1942, I had the opportunity of studying the bird life in the region about Willoughby Lake, just south of Newport, Vermont, at the southern tip of Lake Memphremagog. I had prepared a list of 'probabilities' to be looked for in the region, in which the Wood Thrush was not included.