GENERAL NOTES

Goshawk predation on Sharp-tailed Grouse in the Nebraska sandhills.—There are few observations of Goshawks (*Accipiter gentilis*) preying on prairie grouse. Moran (1966. *Auk*, 83:137) observed a Goshawk kill a Greater Prairie Chicken (*Tympanuchus cupido*) in Wisconsin; this grouse was preyed upon in an area where it had taken refuge after being flushed from a booming ground. Ammann (1959. *J. Wildl. Mgmt.*, 23: 110–111) found a Goshawk feeding on a freshly killed male Sharp-tailed Grouse (*Pedioecetes phasianellus*) on a Michigan dancing ground; and Berger, Hamerstrom, and Hamerstrom (1963. *J. Wildl. Mgmt.*, 27:778–791) observed a Goshawk feeding on the hot carcass of a Greater Prairie Chicken on a booming ground in Wisconsin.

On 7 April 1966, I witnessed Goshawk predation on a Sharp-tailed Grouse on Display Ground 11 on the Bessey District of the Nebraska National Forest, Thomas County, Nebraska. The National Forest is located in the Sandhills and is described in a previous report (Blus, 1966. *Nebraska Bird Rev.*, 34:23–30). A male juvenile sharptail, which had flown from the display ground when I arrived by automobile at 6:15 AM, was taken by an immature hawk 100 yards from the display ground. The Goshawk, flying at an altitude of approximately 4 feet, hit the grouse on the ground. The grouse dragged the hawk for short distances on several occasions in attempting to escape. The hawk began to pull feathers from the breast of its prey about 10 minutes after the strike; the dead sharptail was taken from the hawk at this point.

In five years of prairie grouse study on the 90,000-acre National Forest, observations of seven single Goshawks and one pair were recorded; Goshawks were observed in four of the five years. Only two of these birds were seen in the 25,000 acres of planted coniferous plantations. In addition to the spring kill mentioned above, three hawks (a single and a pair) were observed feeding on two sharptail carcasses in winter; one hawk was relieved of a captured sharptail in winter; two were seen harassing sharptails on display grounds during spring; one was observed in late August flying over an area from which I flushed seven sharptails a few seconds previously; and one was not associated with either harassment or kill of Sharp-tailed Grouse. Karl Menzel (pers. comm.) rescued the captured sharptail mentioned above from a Goshawk in a coniferous plantation; the grouse was not seriously injured and was eventually released. Grange (1948. "Wisconsin Grouse Problems," p. 124) included the Goshawk among the most skillful grouse predators in Wisconsin; this also seems to hold true for Nebraska where Sharp-tailed Grouse are apparently among the preferred prey of this raptor.

Appreciation is expressed to Karl Menzel, C. Phillip Agee, and Carl Wolfe for editorial criticisms. This represents a contribution from Nebraska Pittman–Robertson Project W-33-R "Studies in the ecology and management of prairie grouse."—LAWRENCE J. BLUS, *Nebraska Game, Forestation and Parks Commission, Thedford, Nebraska, 18 October 1966.*

Regurgitation by Killdeer as a possible means of dispersal for seeds and aquatic organisms.—Gleason and Cronquist (1964. "The Natural Geography of Plants." Columbia Univ. Press, New York) suggest that transport via the external surfaces of waterbirds is the principal dispersal means for seeds of aquatic angiosperms. On the contrary, however, Schlichting (1960. *Trans. Amer. Microscopical Soc.*, 79:160–166) has found that mud and debris seldom remain on ducks suspended in air for more than 30 minutes. Resistant disseminules may be carried between aquatic habitats within the

intestinal tract of birds. Barriers to dispersal possibly exist, then, for aquatic organisms lacking resistance to avian digestive processes. A recent observation indicating that dispersal via the avian intestinal tract might be feasible for seeds and other aquatic organisms deficient in resistant disseminules prompted this note.

In the course of an investigation to determine and contrast the effects of avian digestion on disseminules of 23 aquatic angiosperm species, Killdeer (*Charadrius vociferus*) and Mallards (*Anas platyrhynchos*) were fed various seeds. Occasionally Killdeer were observed to regurgitate portions of their meal within one hour after ingestion. The small pellets apparently had not entered the proventriculus for they were not altered by digestive processes. Viable seeds of the plant species under investigation were discovered in each of the disgorged pellets. Regurgitation generally followed the feeding of large seeds or occurred when the birds gorged themselves. My observations of disgorgement by Mallards in the present study confirm an earlier report of this phenomenon by Malone (1966. *Wilson Bull.*, 78:227–228). Disgorgement, however, has not previously been observed among waders.

Little significance can be attached to this observation with respect to dispersal of aquatic plants since a majority of the species surveyed possess resistant seeds which survive passage through the avian intestinal tract. However, seeds (notably of upland plants) which failed to pass successfully through Killdeer remained viable after disgorgement. Seeds of *Ratibida columnifera, Samolus parviflorus, Cosmos bipinnatus,* and *Raphanus raphanistrum* each failed to pass successfully through the Killdeer intestinal tract, but were viable after regurgitation. Other aquatic organisms or their disseminules ingested by Killdeer, yet not capable of withstanding avian digestive processes, may also be dispersed by this method.

Transport via the crop of birds would be a highly advantageous means of overland transport for seeds of aquatic species, aquatic organisms, or other disseminules destroyed by avian digestion or by desiccation. Nevertheless, the occurrence and frequency of regurgitation are poorly documented. Further research is needed to elucidate this neglected mechanism of dissemination.—Victor L. de Vlaming, *Department of Biology, Texas Technological College, Lubbock, Texas. (Present address: Department of Zoology, University of California, Berkeley, California), 3 October 1966.*

Mourning Dove egg in nests of Catbird and Robin.—The Mourning Doves (*Zenaidura macroura*) occasionally utilize nests of other birds and squirrels as a platform for their own frail nest, and they often use old Mourning Dove nests again (Hanson and Kossack, 1963. Illinois Dept. of Conserv. Tech. Bull. 2).

In the spring and early summer of 1966, at Fremont, Nebraska, I observed the re-use of old nests several times. In addition, I observed one Mourning Dove egg placed in an old nest. This one egg was never incubated.

On 6 May, a Robin (*Turdus migratorius*) nest had no eggs at 0555. At 0545 on 7 May, a Mourning Dove was sitting on one Robin egg and one dove egg. The Robin laid three more eggs but the dove was never seen at this nest site again. Three of four Robin eggs hatched but the dove egg was unhatched after 17 days. It was opened and appeared to have been infertile.

On 30 May, a Mourning Dove was discovered incubating one egg in a Robin nest. She had added no nest material to the Robin nest. The egg hatched and the young bird was fledged on 16 June.