

20 were seen on Sept. 29 at Lake Francis at the south-east end of Lake Manitoba when it seems that the species enjoys better conditions. Though undoubtedly overshooting has had a powerful influence in the depletion of the grouse of the prairie provinces it was probably not the whole cause. Throughout the provinces of Manitoba, Alberta and British Columbia we heard practically the same report in 1917. A great abundance of grouse of all kinds followed by sudden disappearance. Coincident with this were unusual numbers of Goshawks and Horned Owls through the late fall and winter of 1916-17 and the failure of the rabbits of all kinds both locally and throughout the north. The connection between all this is obvious. The regularly re-occurring dying of the rabbits through the well known rabbit disease deprived the large raptorial birds of their usual food supply, and they were forced to come into more southern sections and turn their attention to the only food to be found there, the grouse, with the result that the latter were practically cleaned out. The story is remarkably consistent wherever we obtained first-hand evidence, and applied as well to the lonely reaches of the Red Deer river valley, the preserved areas of Dominion Parks, where shooters rarely or never penetrated, as to sections adjacent to dense settlement where the sportsmen would be a most important factor. When limited to animal or steam locomotion the radius of action of the shooter is comparatively small and in the vast extent of the western provinces there remain large expanses where the birds can live practically undisturbed. By use of the automobile, however, there is little chance of retaining sanctity for any purely natural reservation. However, it cannot be doubted that this particular and present low ebb in upland game life is due more to natural causes than to man. Caution must be used in advocating the destruction of large hawks for it is only a few winter species that can be unhesitatingly condemned. The summer hawks do little if any damage† and will be discussed under their proper headings.

86. *MOURNING DOVE, *Zenaidura macroura*.

Not uncommon, they were seen in small numbers on every visit and as late as Sept. 28, in 1918.

87. *MARSH HAWK, *Circus hudsonius*.

This is the commonest hawk of the locality and it was seldom that one or more were not in sight. They seemed to have well defined beats over which they worked regularly at stated times of the day. There were several nests in the vicinity of our camp, one of which was found, though later broken up by some animal of prey of considerable size, as there was evidence of a severe struggle about the nest. A

very pretty sight was witnessed several times. One hawk, usually the male, with a mouse or other prey in its talons approached the nesting marsh calling loudly. It was answered by its mate who rose from the nest and came to the call. They circled and manoeuvred a minute and then, as the female passed beneath her mate, he dropped what he held and she with a quick reach of her talon, caught it in the air and returned to the nest or an adjoining knoll to feed it to the young or to herself. Sometimes several attempts would be made by the two birds to get into the proper relative position, but the upper bird never dropped the prey until he was satisfied that conditions were favorable nor, when he did drop it, did we ever see his mate miss the catch. Marsh Hawks were still common when I returned in the autumn of 1917 and when Young left in early October, 1918.

88. *SHARP-SHINNED HAWK, *Accipiter velox*.

In 1917, one bird seen on May 25th and other individuals on various days during the September visit. In 1918, Young noted occasional individuals throughout the summer except from June 2, to Aug. 5.

89. GOSHAWK, *Astur atricapillus*.

Though no Goshawks were seen in 1917, Young noted two on Aug. 21, 1918. We received such detailed accounts of the number of "large gray hawks" that visited the country the winter of 1916-17 that there could be little doubt as to the identity. Without question these birds together with Horned and Snowy Owls, were the immediate cause of the scarcity of Prairie Chicken, and Sharp-tailed and Ruffed Grouse. This bird is a brush hunter and doubtless accounted for many Ruffed and Sharp-tailed Grouse in the poplar bluffs by day, while the Horned Owls took many by night that roosted in insufficient cover whilst the Snowy Owl that is largely a diurnal hunter scoured the more open places. The trio made a combination that is difficult for any grouse to escape. As mentioned before, doubtless these birds came from the north in such unusual numbers in search of food on the depletion of their usual rabbit supplies. To date, February, 1919, we have received no notification of another flight of these birds. On the contrary all reports point towards an increase of rabbits, and a decrease of destructive raptorial birds in the more settled communities, and we assume that it will be several years before the latter become a serious menace again.

90. *RED-TAILED HAWK, *Buteo borealis*.

Next to the Marsh Hawk this was the hawk most often seen. They were shy, though still not quite as wary as the individuals we are in the habit of meeting in the eastern provinces. They nest in some of

†See Hawks of the Canadian Prairie Provinces, by P. A. Taverner, Mus. Bull. No. 28, Geological Survey, Dept. of Mines, Ottawa, Aug., 1918.