one nest the male alone fed the young. During incubation, territory defense and display flights were lacking, but appeared again after the young were hatched.

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CANADA GOOSE NESTS AND EGGS

BY CECIL S. WILLIAMS AND MARCUS C. NELSON

ASIDE from Bent's (1925) summarization, few comparative records of Canada Goose nest and egg sizes are found in the literature. It is felt, therefore, that the measurements of 174 eggs and more than 100 nests of geese breeding in northern Utah, and the comments on them, will be of interest.

Approximately 1100 pairs of Canada Geese (*Branta canadensis*) breed in Box Elder County, which is one of the northernmost in Utah. Two of the more productive breeding localities in the county are the Bear River Migratory Bird Refuge and the Bear River Silts lying between Brigham City and the Refuge. It was from nests on these two areas that the data herein presented were obtained. Although they constitute but a very small part of the available breeding grounds in the county, they are quite similar to the others, and it is unlikely that the factors influencing the goose population on the various areas differ markedly.

Studies on and in the vicinity of the Bear River Refuge during recent years have indicated some of the major attributes of good goose-breeding areas. Although these are of little concern to the present discussion, they are briefly enumerated for completeness: (1) a browsing area available to nesting birds and to paired adults prior to the nesting season; (2) an aquatic feeding area during the brooding period; (3) a brooding environment of open water and resting banks; (4) molting cover (emergents); (5) a browsing area for broods after they are on the wing (this may be the same as 1); (6) nesting sites isolated from interference; (7) nesting sites providing firm foundations; (8) nesting sites with good to excellent visibility. All these items seem to be essential, or at least very important, in determining breeding populations. Nesting sites are also selected for their proximity to channels and to open ponds that provide avenues to the brooding areas. Muskrat lodges are influential ecological factors, adding considerably to the nesting value of certain emergent environments, notably cat-tail and alkali bulrush.

Since the Canada Goose seldom constructs its nest of foreign materials, it is probable that nesting sites are selected on the basis of their inherent qualities and not on how they might be altered. The available nesting environments vary considerably in meeting the nesting requirements. In areas where suitable food, brooding cover, and molting cover are abundant, preference has been shown to hardstem bulrush, in which the nests are usually located on top of matted culms. Other plant environments utilized were saltgrass, weeds, banks, cat-tails, and alkali bulrush. As has been stated, muskrat lodges contribute considerable value to the two last-named covers.

Almost invariably the materials of which nests are constructed are of the plants in which the nests are located. Additional bolstering materials of other species are used if near at hand. Nests in saltgrass were found to have been occasionally strengthened with cocklebburs, sunflower stems, and wire grass. In one instance, cow dung was used; in another, sago-pondweed that had been deposited on a channel bank by high waters of the previous year. Sticks and debris stranded in this manner probably influenced the selection of a few sites on more or less barren weedy banks. Foreign material was not used in nests in emergent vegetation except when located at borders or in mixed cover type. In two instances old heron nests were used; in another instance, that of a Marsh Hawk; and ten nests were on the sites of old goose nests.

The dull gray down is usually present in the nest soon after the first eggs are laid. By the time the clutch is complete and incubation begins, the nest consists of an outer loose framework of vegetation comparatively free of down; an inner layer of the thick warm down that serves as a blanket for the eggs during absences of the incubating bird; and a compact intermediate layer of smaller fragments of vegetation interwoven with down, which provides the actual form of the cup. Down is added to the nest structure all through the incubation period, especially if winds blow away some from the nest lining. Surrounding vegetation is also taken after incubation starts, as was evidenced by many nests, especially those in saltgrass, so that the nests become encircled by a clipped area as the season advances.

In Table 1 are presented the data obtained on depths of nests, cup diameters, and overall measurements.

It will be noted that two inches and five inches probably approach the lower and upper thresholds of nest depths. The random variations of nest depths between these points are possibly due to the

TABLE 1.—NEST MEASUREMENTS

Depth		*Diameter (cup)*		*Diameter (overall)*	
Inches	*Number*	*Inches*	*Number*	*Inches*	*Number*
				15	6
				16	2
	4			17	1
2.00	—	6.0	1	18	4
2.25	18	6.5	—	19	1
2.50	7	7.0	6	20	3
2.75	22	7.5	5	21	5
3.00	4	8.0	11	22	11
3.25	19	8.5	24	23	6
3.50	3	9.0	33	24	5
3.75	16	9.5	4	25	9
4.00	2	10.0	16	26	6
4.25	5	10.5	3	27	6
4.50	1	11.0	3	28	4
4.75	4	11.5		29	4
5.00		12.0		30	8
		12.5		31	5
		13.0	2	32	4
				33	1
				34	2
				36	4
				37	1
Average	Total	Average	Total	Average	Total
3.2	105	8.9	108	25	100

availability of loose nesting materials. Cover type itself would seem to have little correlation since the range of difference between the cover-type means amounts to only 0.4 inch. The mean depth for all the nests was 3.2 inches, a figure that probably approximates the usual means for goose nests in mixed cover types.

Frequency figures of nest-cup diameters in Table 1 point to a rather definite mean of 8.9 inches for all cover types. There is, however, a range difference of 1.8 inches between the means of different covers, which indicates that smaller cups may be expected in weeds and saltgrass than in the emergents. Average diameters for the various covers were: hardstem bulrush, 8.2 inches; weeds, 8.5; saltgrass, 9.0; cat-tail, 9.0; and alkali bulrush, 10.0. Since few nest peripheries are exactly circular, the overall nest measurements were taken at the widest points. As will be noted in Table 1 where outside diameters

are tabulated, nests vary in width from 15 to 44 inches, and the average of 25 inches does not give an impression of stability. This is probably due to variations caused by the cover types themselves, whose means show a difference in range of 7.6 inches. Nests amidst emergent vegetation had the highest averages, being 27.9, 26.5, and 28.0 inches for hardstem bulrush, alkali bulrush, and cat-tails, respectively. Saltgrass averaged 23.1 inches, and weeds 21.3 inches.

TABLE 2.—EGG MEASUREMENTS

Length		*Width*	
Millimeters	*Number*	*Millimeters*	*Number*
80	3	54	1
81	2	55	5
82	2	56	6
83	4	57	14
84	12	58	23
85	14	59	54
86	24	60	41
87	24	61	22
88	18	62	6
89	24	63	1
90	17	64	—
91	11	65	1
92	12		
93	2		
94	2		
95	2		
100	1		
Average	Total	Average	Total
87.2	174	59.1	174

The eggs, which usually are a dull white when first laid, soon become stained with plant juices and dirt. It is often possible during the early stages of incubation to tell the order in which the eggs of a clutch were laid by the degree to which each is stained. The outer surfaces of the eggs are much smoother than those of the Ruddy Duck and attain a glossy appearance over the dirt as incubation progresses. Bent's (1925) compilation gives the average width and length of 84 wild Canada Goose eggs from various collections as 58.2 and 85.7 millimeters, respectively. As is evident from Table 2, the figures of this study compare favorably with his findings, the averages being 59.1 mm. in width and 87.2 mm. in length. The range

of variation in widths and lengths amounts to 11 and 20 mm., respectively. The measurements of the longest egg were 100 x 65 mm., and those of the shortest 80 x 56 mm. The widest egg was also the longest, but the narrowest measured 95 x 54 mm. Eggs in the same clutch did not show great variation in shape or measurements. One notable exception to this occurred in a clutch of four eggs, the individual measurements of which were as follows: 82 x 59; 87 x 59; 82 x 59; and 100 x 65 mm. It is interesting to note that the last-mentioned egg, an abnormally large one, hatched along with the others.

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RECORDS FROM THE TUCSON REGION OF ARIZONA

BY GEORGE MIKSCH SUTTON

THE writer spent a delightful month (May 16 to June 16) in the spring of 1940, becoming acquainted with the birds of south-central Arizona. In the present paper are listed some of the species noted during the earlier part of this period in the immediate vicinity of Tucson (from May 16 to 19) and in the Santa Rita Mountains, south of Tucson (from May 20 to June 4). Mr. Allan R. Phillips has been good enough to assist in choosing from the writer's extensive notes those data that appear to be deserving of publication at this time, as well as in checking carefully the subspecific identifications of all specimens collected.

Blue-winged Teal, *Querquedula discors.*—Adult male seen flying across an open field in farmlands south of Tucson, May 16. Adult male seen at Binghamton Pond, near Fort Lowell, May 17.

Lesser Yellow-legs, *Tringa flavipes.*—One seen at close range at Binghamton Pond, May 18. The few published records of this species from Arizona are all fall records.

Elf Owl, *Micropallas whitneyi whitneyi.*—Noted repeatedly in oak and other deciduous woodland in Madera Canyon in the Santa Rita mountains at from 4000 to about 5000 feet. May 20–25. Several breed-