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C. S. Johnson

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CANADA GOOSE MANAGEMENT, SENEY NATIONAL WILDLIFE REFUGE

C. S. Johnson

Seney National Wildlife Refuge, Germfask, Michigan

A cherished hope of persons associated with establishment of the Seney National Wildlife Refuge, Schoolcraft Co., Michigan, was that the Canada Goose (*Branta canadensis*) eventually could be induced to nest there; with a breeding colony now established it seems that this has been realized.

Located in the Seney Marshes of the Upper Peninsula, a scene of drastic timber cutting and ill-advised drainage early in this century, the Refuge today exemplifies what can be accomplished when the assistance of Nature is enlisted in wise use of the land. The expansive marshes again provide ideal habitats for many species of ducks and other wildlife as well as the backdrop to the Canada Goose experiment which culminated so successfully.

While the Refuge was still in early developmental stages, the experiment was launched on a sub-zero day late in January 1936 with 300 birds donated by Mr. Henry Wallace of Detroit, Michigan. The intense cold and the presence of coyotes and other predators on the refuge and nearby made confinement of the geese necessary. A 2-acre holding pen with a small water hole within the lee of a wooded hill was prepared and they remained there until spring. About 10,500 pounds of mixed grain, chopped alfalfa, oyster grit, and egg mash were fed. Some loss within such small quarters was inevitable and 14 died. As the breeding season approached, the birds

became more aggressive and much fighting ensued; 22 geese finally escaped through the fence to the open marshes where at least five pairs nested. A camp foreman brought in the young of one pair, and when attempts to return them to the parents failed, they were kept at refuge headquarters but only one was raised. Fourteen young were counted in the remaining four broods, but since they were at large in the marshes their fates were not known; however, numerous reports of the unusual observations of Canada Geese well down the Manistique River that autumn indicated the young were held to the locality by the pinioned parents.

Development of a permanent 400-acre pasture for the birds was started in the spring of 1936, and the remaining birds transferred to a 40-acre section on April 25; several tried unsuccessfully to nest. By autumn the fence was completed around the 400 acres which included three pools impounded by dikes; with the upland and marsh areas then in the enlarged pasture the geese were provided with good living quarters, as evinced by small winter loss in 1936-37, despite a rigorous season. Natural foods were supplemented during this second winter with a mixture of corn, barley and oats and as the 1937 breeding season drew near, egg mash and wheat sprouts were added to the diet to increase egg fertility.

Just before the 1937 nesting season,

26 pairs of geese were released into the completed pools near headquarters, to reduce competition for nesting sites within the goose enclosure and to serve as a check on nesting there. Later observations revealed satisfactory nesting in the pool areas, and 23 nests in the goose pasture. The refuge manager estimated at least 50 young reached flying age in 1937.

By the beginning of the 1938 season the original flock was reduced to 262 birds, but improved water conditions in that year were reflected in the increase of nesting within the pen, 51 nests being found within the enclosure. Sixteen young were raised by four pairs of pinioned birds at the headquarters pool where geese were released to test the value of food in holding them to a given area. Nineteen other young were seen on the open marshes, the progeny of birds nesting freely about the refuge water areas. In all not less than 95 young were produced on the refuge in 1938. Loss of goslings within the goose pen was very high, being attributed chiefly to fighting among the adults and separation of small young from their parents while enroute through the tall grass from their nests to water. On several occasions adult birds or pairs were seen leading 14 to 22 young obviously combinations of several broods or groups of strays.

The year 1939 was not a good one for the Canada Geese; there were 62 nests in the goose pen but the cold wet spring reduced production below that of the previous year. Optimum conditions prevailed in 1940. Previous development work had disturbed the nesting geese, especially shrub and tree clearance from parts of the goose pasture destined to

increase the feeding areas and improve nesting conditions. Better control of water levels on the refuge was possible in 1940 as the dikes were completed. Seventy nests were counted in the goose pasture and a total of 123 goslings banded. At least 25 additional young were raised at large on the refuge marshes.

Steadily improving conditions within the goose pasture continued in 1941; fewer nests were located (60), yet 131 young were banded from them. General observations indicated increased nesting over the refuge marshes and pools but the extensive nesting habitat developed by the restored marshes within the area made any really accurate estimate of production outside the goose pen quite impossible with the limited personnel.

The reduction in nesting within the goose pen noted in 1941 was more obvious in 1942; more important was the increasing numbers of young geese being produced over the refuge at large. With a skeleton force under wartime restrictions only 79 young and 16 young fliers were banded this year, although it was conservatively estimated that at least 200 geese were produced within the pen and on nearby refuge marshes. An additional 25 per cent could safely be added for those produced on outlying marshes of the refuge. When the pinioned birds were corralled in December 1942, only 160 could be accounted for.

High waters during the spring of 1943 resulted in poor nesting both within the enclosure and about the refuge marshes, with fewer young reaching the flying stage than in the previous season.

A check of the pinioned geese just previous to the 1944 breeding season

showed that only 100 remained of the original flock. Twenty-six nests were located in the goose pen where a high nesting success was noted; 103 young were produced in the pasture and at least 62 in Unit 1, an excellent nesting area, and a similar number in Units 2 and 3. Accurate count of the wide marshes of the refuge was impossible and these figures are purposely conservative.

The increased use of the refuge during the 1944 autumn migration period was most noticeable; an estimated 1,200 geese rested for varying intervals within the refuge pool areas.

The success of the experiment seemed assured in the spring of 1945, when only 45 of the original flock were left to nest; but Canada geese then were common on all water areas of the refuge and on many nearby marshes of the Upper Peninsula. Following the breeding season, immature birds were common on these areas. Late in October 1945, when feeding of the refuge geese began previous to their return to the goose pen for the winter, 1,120 were counted on the feeding areas. These undoubtedly were refuge bred geese as exhibited by their fearlessness of the refuge personnel and readiness with which they fed with the pinioned birds. Approximately 2,000 "wild" geese in several small flocks also used the refuge water areas during the autumn flight, but were easily distinguished from the "refuge" birds by their extreme wariness and disposition to take wing when approached. This number was reduced to 450 by November 21 and in January 1946 only 140 remained, the lowest wintering population in the history of the flock. Sixteen fliers appeared at the refuge headquarters feed-

ing area on March 7, 1946, and their numbers continued to increase until 234 birds were present. By April 10, there were 427 geese using Unit I, all but 25 of which appeared completely at home. Geese then were numerous in Units II and III, but the wild flocks seldom remained longer than three or four days and were most conspicuous by their fear of men.

The inverse relation of the number of young Canada geese produced to the number of pinioned birds is shown in Table 1.

TABLE 1.—CANADA GEESE ON SENEY NATIONAL WILDLIFE REFUGE, MICHIGAN.

<i>Year</i>	<i>Number of original flock</i>	<i>Young produced</i>
1936	286	15
1938	262	95
1940	221	148
1942	160	200
1944	100	227
1945	45	200

The banding of locally produced geese since 1941 was seriously hampered by wartime conditions; however, 482 goslings were banded of an estimated 2,000 produced on the refuge since 1936. Returns have been received on approximately 10 per cent of these from nine states and the Dominion of Canada. Seney-bred geese have been taken in James Bay, Canada and Warner Valley, Oregon, but heaviest returns have been from states along the Mississippi Flyway, Michigan and Arkansas leading. Nine per cent of the returns were from birds shot in the immediate vicinity of the refuge one or more years following their banding.

CONCLUSIONS

Ten years of study and management of the Canada goose at the Seney Na-

tion Wildlife Refuge yields the following conclusions:

1. Nesting birds cannot be crowded; not more than one nesting pair to each half acre or acre of nesting territory has been found desirable.
2. Seney-bred geese move mainly

along the Mississippi Flyway, but are of most importance to local hunters.

3. Birds produced on the refuge return to the area of origin following their southern migration, but further banding is needed to determine the percentage that returns.

TRAPPING WILD TURKEYS IN SOUTH CAROLINA¹

William P. Baldwin

U. S. Fish and Wildlife Service, McClellanville, South Carolina

Considering the scarcity of published data on trapping the wild turkey (*Meleagris gallopavo*), the following observations may interest wildlife managers in the Southeast. During five years since 1938 the writer has participated in trapping in several areas. On the Bull's Island unit of the Cape Romain National Wildlife Refuge (Charleston Co., South Carolina) the remnants of an introduced "impure" stock were live-trapped and removed; the island later was restocked with a good strain of wild birds from the adjacent Santee River section of the Francis Marion National Forest. Still later, some of their island offspring (Pl. 2, D) were trapped for release elsewhere, and others were captured and released on the island to test trapping techniques.

In August and September, 1943 the writer assisted with the trapping pro-

gram at the Kentucky Woodlands National Wildlife Refuge. Procedures employed there have been described by Sylvester and Lane (1946).

This article reflects the writer's interpretation of these experiences, with some reference to observations in Kentucky.

These notes are based on the capture of only 70 South Carolina turkeys, but the trapping often has been experimental and selective, and in both deciduous and broad-leaved evergreen forests, where the populations varied from one bird to 15 acres to one per 100 acres. Incorporated here also is the knowledge gained from several hundred hours of observation, from blinds, of turkeys feeding in and around traps.

BAITING

It is first necessary to select as trap sites places through which turkeys travel most commonly. On protected refuge areas, the natural terrain is most important, as are man-made features such as fence lines, truck rails, and clearings. The first Bull's Island trap, built in 1938, was near a truck trail on

¹ Most of the South Carolina work described here was performed by Andrew H. DuPre (refuge manager of Cape Romain), William L. Hills, and the writer, with assistance by Harold L. Blakey, Erwin Driggers, Waring W. Hills, Charles H. Mills, John Eadie, Jack R. Taylor, and Richard Nesbit.