OBSERVATIONS OF WILD HYBRIDS BETWEEN CANADA AND BLUE GEESE

J. P. PREVETT

AND

C. D. MacINNES

University of Western Ontario
London 72, Ontario, Canada

Although Canada Geese (*Branta canadensis*) and Blue Geese (*Anser caerulescens*, including both "snow" and "blue" phases, after Cooch 1961) hybridize quite commonly in captivity (summarized in Gray 1958), we have found just one published report of wild hybrids (Nelson 1952). While searching flocks of Blue and small Canada Geese (*B. c. hutchinsii*) for neck bands in the central United States and on the arctic breeding grounds, we sighted 30 hybrids in 5 years. Detailed descriptions were recorded for 10 birds and some features were noted for a further 10. We were also able to examine in the hand four hybrids trapped at Sand Lake National Wildlife Refuge, South Dakota. In addition, we have included descriptions of two wild hybrids recorded by B. C. Lieff (pers. comm.) and a single hybrid specimen obtained by R. H. Kerbes (pers. comm.) on southwestern Baffin Island, N.W.T., during banding of molting geese in August 1968.

DESCRIPTION OF HYBRIDS

All but six of the hybrids appeared to be in adult plumage. They closely resembled hybrids described by Nelson (1952), showing both Blue and Canada Goose features. In overall body shape and plumage markings, most adults suggested Blue Geese with body coloration of Canada Geese. The head and neck were predominately white with variable amounts of black, particularly on the top and back of the head and on the hindneck. Upperparts were very similar to those of Canada Geese. The color was gray-brown, somewhat darker than in Canadas. Barring typical of Canada Geese, due to lighter tips of feathers, could be seen on the back and sides at close range. Some inner secondary coverts of two adults were white-edged as in Blue Geese, although faint on one bird. Tertials were not long or edged with white. Underparts of five adults were white or very pale gray from the breast to the belly but in the others were gray to gray-brown on the breast with white lower belly and crissum, more like a Canada Goose. The former possibly had a Snow Goose or "white-bellied" Blue Goose parent, whereas the latter probably had a Blue Goose parent. The color of the rectrices of six adults was dark brown to black; some feathers were white-tipped in at least three birds, but not broadly edged with white as in Blue Geese. Five also showed a white crescent on the rump in flight, like that of a Canada Goose.

Bill, foot, and leg color was variable. Bills usually appeared dark gray to black but were distinctly pinkish in six hybrids observed in the hand and at close range in the field. They were shorter and more slender than bills of Blue Geese and the characteristic "grin patch" of Blue Geese was either much reduced in size or absent. The Baffin Island specimen had longer, heavier tomial serrations than Canada Geese but much shorter than Blue Geese. Similarly, feet and legs of most adults appeared gray to black but pale pink in four birds and rather bright pink in another, close to that of a Blue Goose. Two hybrids with pinkish legs did not show pink on their bills. One adult observed at close range had dark-brown legs and feet, but with conspicuous pink on the webs.

Four apparent juvenile hybrids differed from adults mainly by their predominately dark-gray-brown heads and necks. Two had some white speckling on the head and one of these had faint but discernible gray cheek patches and inner secondary coverts edged with white. The bill of the latter had a Blue Goose profile and body size was larger than small Canada Geese with which it was associated but smaller than nearby large Canadas. A third juvenile hybrid closely resembled a juvenile Blue Goose but was browner, lacked white-edged tertials and secondary coverts, and on close inspection, a faint lighter brown cheek patch was evident. It is doubtful if this bird would have been identified as a hybrid under normal field conditions. It was held in captivity and upon assuming adult plumage resembled a "typical" hybrid with gray-brown body and white head and neck. A fourth possible juvenile hybrid had a black head and neck with white cheek patches; however, body color was somewhat paler and the head was larger and appeared coarser than a Canada Goose.

Two apparent hybrids observed together at McConnell River, N.W.T. (60°50′ N, 94°25′ W) by B. C. Lieff (pers. comm.) on 15 July 1970 were evidently yearling brood mates. One bird was still predominately in juvenile plumage. It had a dark-brown back and blackish neck and head but with a light, indistinctly defined cheek patch. Some white streaking was visible at a distance on the secondary coverts. The other yearling hybrid also had a dark-brown back but the head was predominately white and more white showed on the secondary coverts. Body shape and bill proportions of both were more like a Blue Goose but the necks seemed longer and finer.

Body size of hybrids appeared to be somewhat larger than small Canada Geese but rarely as large as Blue Geese, although Blue Geese were not always nearby for comparison. Also, the head and neck of most hybrids were heavier and more massive than in Canada Geese but finer than those of Blue Geese. Overall body proportions more closely resembled those of Blue Geese.

STATUS OF HYBRIDS

The status of most hybrids was not determined. Two, however, were in family groups. One family, consisting of a hybrid, a Canada Goose, and a Blue Goose (blue phase), was seen on 8 and 9 November 1969 at Sand Lake National Wildlife Refuge. The hybrid, with a white head and upper neck and gray breast, appeared to be in adult plumage, suggesting that it was a yearling still associated with its parents. An adult male hybrid mated with a Canada Goose at the McConnell River was seen on 18 and 20 July 1970 with four, then three goslings 2–3 weeks old. A second adult male was found on 24 June 1971 defending a female Canada Goose incubating six eggs. Although these must have been incubated for at least 10 days, none showed any development. Gray (1958) reports that several offspring from male Blue × female Canada Goose matings in captivity were sterile although hybrids from male Canada × female *A. c. caerulescens* crosses "may occasionally be fertile."

In addition to the two apparent yearlings observed together at McConnell River, we have recorded three other instances of two adult-plumage hybrids still possibly associated as brood-mates: on 29 November 1961 at Laguna Atascosa National Wildlife Refuge, Texas; 4 December 1969 at Salt Plains N.W.R.,

TABLE 1. Field counts of Blue × Canada Goose hybrids in flocks of small Canada Geese (*B. c. hutchinsii*).

	1961		1966–67		1967–68		1968–69		1969–70	
	Canada Geese	Hybrids	Canada Geese	Hybrids	Canada Geese	Hybrids	Canada Geese	Hybrids	Canada Geese	Hybrids
Northern States	18,511	2	–	–	9,718	1	–	–	3,331	0
North Texas-Oklahoma	19,955	6	1,343	0	–	–	–	–	5,330	2
Gulf Coast	6,154	4	5,445	0	3,528	0	7,123	1	7,965	1
Totals	44,620	12	6,788	0	13,246	1	7,123	1	16,626	3

Grand Total: 88,403 Canada Geese and 17 hybrids (0.02%)

Oklahoma; and in November 1961 when two hybrids were found next to each other under cannon nets during banding operations at Sand Lake N.W.R. A Canada Goose and a hybrid seen on the ground and flying together on 16 June 1967 at the McConnell River could have been a mated pair.

FREQUENCY OF HYBRIDS

All hybrids were associated with small Canada Geese (predominately *B. c. hutchinsii*) and most were sighted as flocks of this species were being closely searched for neck bands.

Although large numbers of Blue and small Canada Geese often occurred together on migration stopover and wintering areas, flocks did not freely mix, even when sharing the same field. The Blue Goose observed in the family party at Sand Lake National Wildlife Refuge was the only individual of this species in a flock of approximately 3000 small Canadas.

Twenty-six hybrids were observed in the central United States and along the Gulf Coast. One observation was from the Perry River, N.W.T. (67°20′ N, 102° W) and the remainder at McConnell River, N.W.T. Accurate counts were made to determine the ratio of banded to unmarked geese (see MacInnes 1966), thereby also providing an unbiased estimate of the frequency of hybrids among Canada Geese (table 1). This frequency (0.02%) is lower than that obtained by Nelson (1952) from the ratio of hybrids to Canada Geese shot at Sand Lake, N.W.R. in 1950 ($P < 0.05$) but is similar to the frequency of hybrids trapped with small Canada Geese for banding at Sand Lake from 1960 to 1970 ($P > 0.10$). The latter data, supplied by Lyle J. Schoonover (pers. comm.), show a frequency of 0.04% (5 hybrids in 13,108 Canada Geese). Each of these estimates is lower than rates of hybridization calculated for the closely related Ross' (*Anser rossii*) and Blue Goose (Trauger et al. 1971) and the similarly closely related Mallard (*Anas platyrhynchos*) and Black Duck (*Anas rubripes*) (Johnsgard 1967). If a hybridization rate including neck band frequency counts of Blue Geese was calculated, the figure would be much smaller. No hybrids have been sighted during counts of over 600,000 Blue Geese, although their superficial resemblance to Blue Geese might have allowed hybrids to escape notice in densely packed flocks.

A probable factor leading to occasional hybridization between Blue and Canada Geese is interspecific egg-dumping. Goslings hatched in nests of the opposite species could become imprinted to the wrong species-specific characteristics. Differences in courtship and pairing behavior between *Anser* and *Branta* are slight (Johnsgard 1963; Raveling 1967) and might not prevent interspecific pair formation involving individuals imprinted to the wrong species. Newly hatched blue goslings have been found in nests of Canada Geese four different times at the McConnell River. In three cases the blue gosling disappeared from the brood within a few days of hatching; once, however, the blue gosling was seen daily with its neckbanded "parents" and three Canada goslings and was later captured with them in a banding drive. *B. c. hutchinsii* and Blue Geese nest in close proximity to each other at several locations in the Canadian Arctic. Competition for nest sites between Canada and Blue Geese, particularly in late seasons when nesting habitat clears slowly making nest sites unavailable to many females ready to lay eggs, could be expected to result in a regular low incidence of egg-dumping and subsequent hybridization.

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