GIANT CANADA GOOSE RESTORATION IN IOWA

By Guy Zenner, Waterfowl Research Biologist

Giant Canada geese (*Branta canadensis maxima*) were the largest and most widely distributed of the 7 subspecies of Canada geese found in North American at the time of European settlement. Their historical nesting range covered most of the central part of the continent, including all of Iowa (Cooke 1906, Hanson 1965) (Fig. 1). Despite this bird's widespread distribution, the unregulated subsistence hunting, egg gathering, and wetland destruction that accompanied 19th century settlement of North America pushed it to near extinction. By 1900, the number of giant Canada geese nesting south of central Iowa were few (Cooke 1906) and extirpation progressed northward until these birds disappeared from the lower 48 states by the 1930's (Hanson 1965).

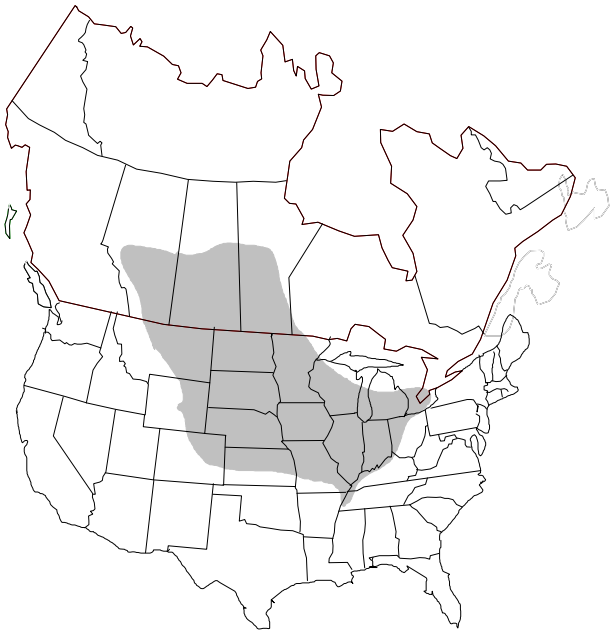

Fig. 1. Breeding range (shaded area) of giant Canada geese prior to European settlement (Hanson 1965).

The Iowa Conservation Commission, now the Iowa Department of Natural Resources (IDNR), initiated a program to restore giant Canada geese to their former nesting range in Iowa in 1964 (Bishop and Howing 1972). The restoration project began at the Ingham Lake Wildlife Management Area (WMA) (Fig. 2) with 16 pairs of pinioned giant Canada geese whose origins could be traced to geese taken from the wild in northern Iowa, southern Minnesota and South Dakota (Bishop and Howing 1972). The pinioned geese reproduced in a 14-acre pen and the young were permitted to fly and use surrounding habitats. To enhance the survival of the free-flying young geese, all public and private lands in a 120-mi.^{2} area around Ingham Lake were closed to Canada goose hunting in 1967 (Table 1). As a result of this program, the first nest of a free-flying giant Canada goose found in the wild in Iowa after 1900 was located in 1967 on a marsh 1 mile north of East Slough near Ingham Lake (Bishop and Howing 1972).

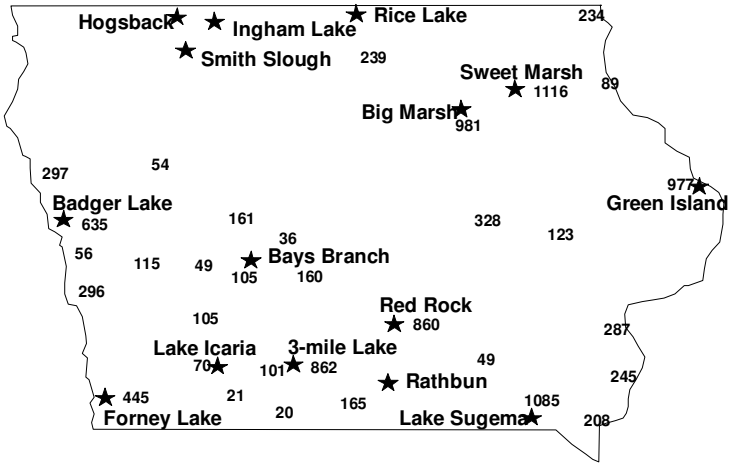

Fig. 2. Locations of giant Canada goose flocks and numbers of translocated geese by release site, 1964-98.

Similar methods were used to restore nesting populations of giant Canada geese to the Ruthven (Smith Slough), Spirit Lake (Hogsback) and Rice Lake areas in 1971-72 and to Rathbun Reservoir, Bays Branch and Lake Icaria in southern Iowa during 1977-79 (Fig. 2) (Bishop 1978). Additional flocks were

started at Red Rock Reservoir, Badger Lake, Green Island, Big Marsh, Sweet Marsh, Lake Sugema, 3-mile Lake, and Forney Lake between 1981 and 1994 by releasing flightless goslings at these sites rather than establishing penned flocks (Zenner and LaGrange 1998a).

In all these cases, large areas around the penned flocks or the release sites remained closed to Canada goose hunting (Table 1). In 2000, 15 areas around restoration sites, ranging in size from 18-322 mi.^{2}, remained closed to Canada goose hunting. In many cases, the size of the area that is presently closed to Canada goose hunting is only a fraction of its original size.

Management of closed areas has been a critical element of the giant Canada goose restoration program in Iowa. Giant Canada geese are particularly vulnerable to harvest on their natal areas; nearly 68% of the direct band recoveries of Iowa giant Canada geese during 1981-90 seasons were harvested in Iowa (LaGrange and Zenner 1998). (Direct band recoveries are banded birds recovered during the first hunting season after they were banded.) More than 50% of these geese were taken within the first 9 days of the season.

Table 1. Initial and persent size (mi.^{2}) of areas closed to Canda goose hunting around restoration sites, 1967-2008.

Restoration Site	Year Estab.[1]	Size Initial	2000	2008
Ingham Lake	1967	120	18	18
Smith Slough	1971	63	20	20
Hogsback	1971	57	33	16
Rice Lake	1972	113	28	28
Rathbun	1977	2	23	*Elimin.
Bays Branch	1978	150	26	26
Lake Icaria	1979	88	45	17
Red Rock	1981	3	155	*Elimin.
Badger Lake	1987	32	182	80
Green Island	1990	39	39	18
Lake Sugema	1992	322	322	87
Big Marsh	1994	68	68	32
Sweet Marsh	1994	130	130	61
Three-mile Lake	1995	69	69	16
Forney Lake	1996	66	66	*Elimin.

[1]Year the closed zone was established.
*Closed zone eliminated.

To accelerate the expansion of the Canada goose populations into unoccupied habitat, the IDNR translocated 14,500 geese to 38 sites during 1983-98 (Fig. 2). Geese were not released in urban areas despite requests by the public to do so. Neck-collar observations of marked translocated geese confirmed that successful nesting occurred within 3 years at many of these release sites.

Estimates of Iowa's giant Canada goose population have been made annually since the restoration program was initiated. Geese are counted from the ground by IDNR personnel during April and May on all major WMA's and estimates of geese on private lands are made by direct observation or consulting landowners. A statewide aerial survey was implemented in 1994. These estimates indicate that Iowa's giant Canada goose population has grown at average annual rates of 22%, 15%, 17% and 10% during 1970-79, 1980-89, 1990-99, and 2000-09, respectively. However, Canada goose spring population aerial survey conducted across Iowa during 2006-09 indicated that the population was stable from 2006-09. In 1975, giant

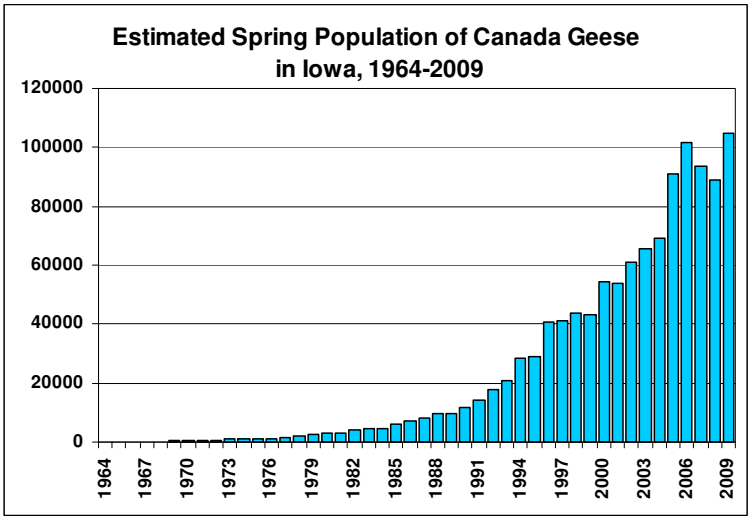

Fig. 3. Estimates of the giant Canada goose population in Iowa, 1964-2009

Canada geese nested in just 8 counties in northern Iowa. By 1985, they nested in 55 of Iowa's 99 counties. In 1993, at least 1 pair of Canada geese had been observed nesting in every county in Iowa (Zenner and LaGrange 1998a).

Since the restoration program was initiated, the highest densities of nesting giant Canada geese have been found in northwest and north-central Iowa. In addition to containing the oldest restoration flocks, these regions also have some of the most highly productive nesting habitat, i.e., prairie wetlands. Recent population increases in other parts of Iowa, however, have contributed substantially to the growth observed in the last two decades.

There are still parts of Iowa, particularly southern Iowa, where suitable nesting habitat is only sparsely populated with geese. Densities of nesting geese in these areas are much lower than in north-central and northwestern Iowa. Prairie marshes in north-central and northwestern Iowa usually contain an abundance of high-quality nest sites, like muskrat houses, that facilitate high densities of nesting geese and increase the odds of these birds hatching their nests. Marshes are less common landscape features in other parts of the state, so geese nesting outside Iowa's prairie pothole region are often less productive. Many wetlands found outside the prairie pothole region are located in river bottoms where periodic flooding can substantially reduce nest success. These factors, as well as higher predation rates on nests and goslings, appear to slow goose population growth outside the prairie pothole region.

Biology and Behavior

Like other geese, giant Canada geese are long-lived birds with low reproductive rates and high survival rates. Of the Canada geese that visit Iowa each year, giant Canada geese have the highest reproductive rate and highest survival rate (Table 2). Unlike interior Canada geese and Cackling geese that nest in sub-Arctic and Arctic environments where annual production is greatly influenced by weather conditions, giant Canada geese inhabit a temperate environment with relatively stable breeding habitat. Giant Canada geese also tolerate human disturbance and willingly nest in close proximity to each other (Klopman 1958, Ewaschuk and Boag 1972, Zenner and LaGrange 1998b). Combined with their willingness to use a wide variety of wetland habitats, these factors result in more consistent annual production from giant Canada geese than from Arctic and sub-Arctic nesting geese.

Giant Canada geese usually start nesting when 3 years old, although some may start when only two (Hanson 1965). Average clutch size is 5-6 eggs and usually 3 goslings survive to flight-stage (Bellrose 1976, Nigus and Dinsmore 1980). Nonbreeding geese and failed nesters often migrate north in late May or June to molt, some as far north as the coast of Hudson Bay in northern Manitoba. Female geese, accompanied by their mates, usually return to the area where they first learned to fly when they reach breeding age, thereby perpetuating or establishing a nesting population (Hanson 1965). This behavior, which is called homing, contributed significantly to the success of restoration programs, especially efforts to repopulate areas by translocating goslings. Adults and goslings have strong ties to natal areas and often remain near these areas until winter weather forces them to leave. Compared to the migrations of interior Canada geese and Cackling geese, most giant Canada geese migrate relatively short distances.

Table 2. A comparison of biological and population aspects of giant Canada geese (*B. c. maxima*) (large geese), interior Canada geese (*B. c. interior*) (medium geese) and Cackling geese (*B. h. hutchinsii*) (small geese) in the Mississippi Flyway.

Population Trait	Large Geese *B. c. maxima*	Medium Geese *B. c. interior*	Small Geese *B. c. hutchinsii*
Weight (pounds)	9-12	7-9	4-7
Nesting area	S. of latitude 54	Latitude 50-60	N. of latitude 60
Age at first nesting	2-3 years	2-5 years	2-5 years
Clutch size	5-7 eggs	3-5 eggs	3-5 eggs
Reproductive success	High, constant	Medium, fluctuates	Low, boom-bust
Migration distance	Short	Medium	Long
Wintering areas	Latitude 37-45	Latitude 35-43	S. of latitude 35
Exposure to hunting	50-120 days	160 days*	160 days*
Adult survival	0.9	0.7-0.9	0.7
Population trend	Increasing	Fluctuating	Fluctuating

*plus subsistence hunting

Giant Canada geese are primarily grazers, preferring the new growth of grasses, sedges and forbs. They select grazing sites that have good visibility so predators can be easily detected, especially when the goslings are flightless. During fall and winter, they feed extensively on waste grains in harvested fields. They also feed extensively on aquatic plants, primarily submergent plants and their tubers, when and where such forage is available. Their adaptable feeding behavior and tolerance for human disturbance has enabled them to successfully exploit many modern environments.

The giant Canada goose population in Iowa will probably slowly increase for the next few years as geese continue to move into unoccupied habitat. At some point, however, giant Canada geese will occupy most of the available habitat in Iowa and the population will stabilize. At that time, the restoration project will be complete.

If you could have flown over Iowa in 1800, you very likely would have seen giant Canada geese on many of the lakes, marshes and rivers across the state. If you had taken the same flight in 1900, you would not have seen any giant Canada geese and would have found the landscape dramatically altered. Now, at the beginning of a new century, you can once again see giant Canada geese on many of the states lakes, marshes and rivers. The population may not be fully restored, but it has come a long way in the past 40+ years. The restoration of the giant Canada goose population in Iowa and surrounding Midwest states is one of the major achievements of wildlife conservation in the 20th century.

LITERATURE CITED

Bellrose, F. C. 1976. Ducks, geese and swans of North America. Stackpole Books, Harrisburg, PA. 543pp.

Bishop, R. A. 1978. Giant Canada geese in Iowa. Iowa Conservationist. 37(10):5-12.

_____, and R. G. Howing. 1972. Re-establishment of the giant Canada goose in Iowa. Proc. Iowa Acad. Sci. 79:14-16.

Cooke, W. W. 1906. Distribution and migration of North American ducks, geese and swans. U.S. Biol. Surv. Bull. 26. 90pp.

Dinsmore, J. J. 1994. A country so full of game: the story of wildlife in Iowa. University of Iowa Press, Iowa City. 249pp

Ewaschuk, E. and D. A. Boag. 1972. Factors affecting hatching success of densely nesting Canada geese. J. Wildl. Manage. 36:1097-1106.

Hanson, H. C. 1965. The giant Canada goose. S. Ill. Univ. Press, Carbondale. 226pp.

Klopman, R. B. 1958. The nesting of the Canada goose at Dog Lake, Manitoba. Wilson Bull. 70:168-183.

LaGrange, T. G. and G. G. Zenner. 1998. Iowa's role in the harvest of several Canada goose populations in the western Mississippi Flyway. Pages 143-149 *in* D. H. Rusch, M. D. Samuel, D. D. Humburg, and B. D. Sullivan, eds. Biology and management of Canada geese. Proc. Int. Canada Goose Symp., Milwaukee, WI.

Nigus, T. A., and J. J. Dinsmore. 1980. Productivity of Canada geese in northwestern Iowa. Proc. Iowa Acad. Sci. 87:56-61.

Zenner, G. G. and T. G. LaGrange. 1998a. Giant Canada geese in Iowa: restoration, management, and distribution. Pages 303-309 *in* D. H. Rusch, M. D. Samuel, D. D. Humburg, and B. D. Sullivan, eds. Biology and management of Canada geese. Proc. Int. Canada Goose Symp., Milwaukee, WI.

Zenner, G. G. and T. G. LaGrange. 1998b. Densities and fates of Canada goose nests on islands in north-central Iowa. Pages 53-59 *in* D. H. Rusch, M. D. Samuel, D. D. Humburg, and B. D. Sullivan, eds. Biology and management of Canada geese. Proc. Int. Canada Goose Symp., Milwaukee, WI.