

# RESULTS OF SNOW GOOSE BANDING ON THE SAGAVANIRKTOK RIVER DELTA, ALASKA, 2010

## FIELD REPORT

Prepared for

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## INTRODUCTION

Increasing numbers of Snow Geese in northern Alaska are fairly recent phenomena (see Ritchie et al. 2000, Ritchie et al. 2008). Colonies have been known to occur on a number of river deltas for decades (e.g., Sagavanirktok River, Johnson 2000; Ikpikpuk River, Ritchie et al. 2000), but have grown substantially only in the last decade. Because in some regions of the Arctic an over-abundance of Snow Geese has caused extensive damage to habitats used by geese and other wildlife (e.g., Batt 1997), closer monitoring of regional Snow Goose populations on the North Slope of Alaska is important.

Colony visits, brood-rearing surveys, and banding of Snow Geese all have contributed to past monitoring efforts at sites along the Arctic Coast between Kasegaluk Lagoon and Prudhoe Bay. These investigations have revealed substantial increases in local populations of Snow Geese, including birds nesting on Howe Island in the Sagavanirktok River delta (Rodrigues et al. 2007, Noel et al. 2004). First described in 1971 by Gavin (1976), Howe Island is the best known

Snow Goose colony in Alaska (Johnson and Noel 2005), although it is no longer the largest. In 2010, over 1,000 pairs of Snow Geese nested on Howe Island, similar to nest numbers recorded in 2008 (Blees et al. 2010). Prior to 2006, the number of Snow Goose nests in the Sagavanirktok River delta was highly variable and ranged between 0 and 455 (Rodrigues et al. 2007).

In the Sagavanirktok River delta from 1980–1993, efforts were made to band (and neck-collar) 100% of the annual breeding population (including goslings), and an analysis of that data indicated that colony growth at that time was attributable entirely to internal growth (Johnson 1995). However, the recent rapid rates of increase in the numbers of Snow Geese regionally strongly suggests increased immigration from populations outside of Alaska. In 2008, BP Exploration Alaska, Inc., initiated banding efforts in the Sagavanirktok River delta, to complement other banding efforts happening elsewhere on the Arctic Coastal Plain in assessing the growth of the Snow Goose population regionally. Banding occurred on the Ikpikpuk River delta between 2000–2008, until the colony was disrupted by brown bear predation in 2009 and 2010, and on the Colville River delta in 2008 and 2010. The Sagavanirktok River delta project was to continue for 3 years, although banding did not take place in 2009 because nest success was low (Rodrigues et al. 2009) and gosling survival minimal (ABR, unpublished data). Because of the lack of goslings, adult Snow Geese were able to pass through molting more quickly and were largely flight capable at the time of banding.

A long-term goal of banding Snow Geese on the Sagavanirktok River delta is to better understand recent growth of the Howe Island colony and to investigate the interrelationships among Snow Goose colonies in Alaska and with the rest of the Western Arctic population of Lesser Snow Geese. The Western Arctic population is composed mainly of birds produced in the very large colonies of western Canada and Wrangel Island, Russia. One objective of the 2010 field effort was to capture and band breeding Snow Geese with the expectation that band returns from this and other banding efforts (both previous and future) will better elucidate interrelationships between colonies. Also an important objective of this field work was to determine if Snow Geese are being affected by BP Liberty Seismic and Development work. Concerns were raised by stakeholders that the seismic work in the southern Beaufort Sea, from approximately Howe Island to Tigvariak Island, could negatively impact Snow Goose populations in that area (e.g., reduce productivity). Monitoring numbers of brood-rearing birds,

group composition (adults and goslings) and general measurements such as weights may provide comparative data among years and between different areas. This report briefly describes our banding activities and preliminary results of our captures on the Sagavanirktok River delta. Additional results (fall and winter recovery information) will be presented in the Annual Snow Goose Report prepared for the North Slope Borough Department of Wildlife Management.

## **STUDY AREA**

The general study area extended 40 km across the Sagavanirktok River and Kadleroshilik River deltas, from Heald Point to Tigvariak Island, and our banding activities focused within 7 km of the coastline (Figure 1). The Prudhoe Bay oilfield is immediately west of the study area and the Endicott Road crosses the delta, bisecting the study area into eastern and western subareas (Figure 1). Howe Island, where most of the Sagavanirktok River delta population nests in most years, is located in the western subarea of the study area.

The Sagavanirktok River drains into the Beaufort Sea in wide alluvial fans. Between channels, the delta has numerous ponds, small creeks, and sloughs. Coastal tundra habitats on the delta include extensive sedge communities, basin complexes, and salt marshes, with plant communities common to the Arctic Coastal Plain Ecoregion (Gallant et al. 1995).

## **METHODS**

We used a Bell 212 helicopter to assist in the capture of Snow Geese on the Sagavanirktok River delta on 1–4 August 2010. The helicopter was used to deploy 4–5 persons near a group of brood-rearing Snow Geese. While the geese fled, the ground team quickly fanned out and the helicopter moved ahead of the geese, bringing them to a standstill. At that point, 2 additional persons exited the aircraft and joined the others, circling the geese. When the birds were securely held, 2 people returned to the helicopter to retrieve nets and banding equipment, setting up a net enclosure with funnel-like entrance on a flat, relatively dry tundra site within 200 m of the captive Snow Geese. The ground crew then slowly walked the birds into the enclosure.

Once inside the enclosure, each bird was captured and processed by the banding crew. For each bird captured, we recorded the age, sex, and color phase. For a sample of birds, we also recorded tarsal, culmen, and 9<sup>th</sup> primary lengths, and weight. If captured adults were previously

banded, we recorded the USFWS metal band number. The USGS–BRD Bird Banding Lab was contacted for age and banding location of recaptured birds. Unmarked birds, both adults and goslings, were banded with size USFWS 7B aluminum butt-end bands. After banding, we placed each banded bird in a second netted enclosure, where they were held until the entire group was processed. To limit possible separation of goslings from their parents, birds were released *en masse* after banding was completed.

## RESULTS AND DISCUSSION

In 2010, we handled a total of 1,810 Snow Geese at 11 banding sites from the Sagavanirktok River delta east to the Kadleroshilik River, banding 717 goslings, 945 adults, and 4 birds whose age was not recorded (Table 1). Included in the total birds handled, we recaptured 144 previously banded birds. However, of these recaptures, 9 adults and 1 gosling had been captured earlier in our 2010 efforts, but had mixed in with another group and recaptured. Of these twice-captured birds, 8 (7 adults and 1 gosling) had been newly banded in 2010, and 2 were recaptures from 2008. Excluding these twice-captured birds meant that recaptures actually totaled 134 geese and unique birds handled totaled 1,800 geese (Table 1).

The number of birds captured at each banding site varied between 60 and 365 birds. Goslings comprised 40% of the total number of birds captured, with the percent of goslings in each group ranging from 11% to 57%. Goslings represented a smaller percentage of the total number of birds captured in 2010 compared to 2008, when goslings constituted 53% of all Snow Geese handled. The sex ratio among both age classes in 2010 was close to 1:1, but females were slightly more common (54%) among goslings. Among previously banded birds, the oldest known-age bird was 17 years old and was originally banded on the Sagavanirktok River delta.

Blue phase Snow Geese were uncommon in 2010: slightly less than 1% of the geese we captured (16 new birds [8 adults and 8 goslings] and 2 recaptures [both adults]) were blue phase birds. This was a lower percentage than in 2008 when blue phase geese represented 1.5% of the total birds captured. In recent years, blue phase geese also comprised >1% of the breeding population in the Ikpiqpuk Snow Goose colony (Ritchie et al. 2008). The proportion of blue phase geese breeding in Alaska appears to be increasing compared to 27 years ago, when the first

blue phase goose was banded on SRD (Johnson and Troy 1987). In 1981, only 3 of 411 birds (0.7%) captured on the Sagavanirktok River delta were blue phase.

Previously banded birds were also uncommon in 2010 (8% of all birds handled), but the percentage was greater than in our initial year (2008: 3%). Previously banded birds were found at all 11 banding sites. Of the recaptured birds, 99% were white phase Snow geese, 63% were female, 36% were male, and for 1% sex was not recorded. Most (87%) of the recaptured birds were previously banded in the study area in 2008, only 13% (18 birds) came from outside the area, including 17 white phase geese (8 males and 9 females) and 1 blue phase goose.

Of the 18 Snow Geese banded outside our study area, 8 birds (44%) were from the Ikpikpuk River delta/Piasuk River area ~200 km west, 6 birds (33%) were from the Northwest Territories, 1 bird was from the Colville River delta, and 1 from Nunavut (Table 2, Figure 2). For the remaining 2 birds, “Alaska” was listed as their original banding location. One was banded in 1993 and the other in 2001. These dates correspond with earlier banding efforts on the Sagavanirktok River delta, but geese banded during these efforts are still considered “foreign” by the banding laboratory because they were banded by a different team. Between 1980 and 1993, nearly 100% of the Sagavanirktok delta breeding population of Snow Geese was banded annually (5,780 total birds; Johnson 2000). In 2001, 72 Snow Geese were banded (Noel 2002). In 2008, we recaptured 8 geese that were originally banded by these previous efforts in the Sagavanirktok River delta area.

There were pronounced differences in gender composition based on original banding location in the recaptured birds considered “foreign” by the banding laboratory. For the Snow Geese banded originally in Alaska (Ikpikpuk River delta, Colville River delta, and earlier on the Sagavanirktok River delta), females were most common (73%, 8 of 11 birds, or 67% if the 2 geese banded earlier on the Sagavanirktok River delta are excluded). For geese originally banded in Canada (NW Territories and Nunavut), males were more common (86%, 6 of 7 geese). Snow Geese are known to have strong natal philopatry (Cooke et al. 1975) in which females are more likely to return to the region where they were born whereas males are likely to follow their mates.

In addition to the Snow Geese captured at the 11 banding sites, there were an estimated 1,200 failed or nonbreeding Snow Geese in 5 different groups within the study area in 2010.

These groups ranged in size from 50 to 500 birds. There was also a small brood-rearing group of 40 adults and 40 goslings that we did not capture as we knew that some of our banded birds had mixed in with this group after they were released and we did not want to subject them to the stress of capture again. Combined with Snow Geese we handled during banding, at least 3,000 Snow Geese were in the greater study area (Heald Point to Kadleroshilik River) in August 2010.

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Table 1. Summary of age, sex, and color phase of Snow Geese banded or recaptured at 11 sites in the Sagavanirktok River delta study area, Alaska, 2010.

Date	Location	Color Phase	New Bands						Recaptures <sup>a</sup>		All Birds			
			Adults			Gosls			Unknown		Adults		All Ages	
			Female	Male	Total	Female	Male	Total	Total	Total	Total	Total		
8/1/2010	West Howe Island	White	31	36	67	61	49	110			36		213	
		Blue	1	2	3	2	3	5			1		9	
		Subtotal	32	38	70	63	52	115			37		222	
8/2/2010	Endicott Road East #1	White	17	13	30	13	10	23			8		62	
		White	81	93	174	86	77	163			24		362	
		Blue	1	1	2		2	2					4	
	Subtotal	82	94	176	86	79	165			24		366		
8/3/2010	Endicott Road East #3	White	99	101	200	14	12	26			13		240	
		White	29	34	63	40	44	84			7		154	
		Blue				1		1					1	
	Subtotal	29	34	63	41	44	85			7		155		
8/4/2010	East Dock	White	9	12	21	20	14	34			4		60	
		White	70	64	134	31	31	62			16		212	
		Blue	1		1								1	
	Subtotal	71	64	135	31	31	62			16		213		
8/4/2010	Kadleroshilik Delta North	White	25	25	50	17	17	34			8		92	
		White	460	485	945	386	331	717			134		1,800	
		Total												

a. Recaptures exclude the 10 geese (9 adults and 1 gosling) captured on both 1 and 3 August 2010. Eight of these were newly banded birds and 2 were recaptures from 2008



Table 2. Band histories of “foreign” Snow Geese recaptured on the Sagavanirktok River delta, 2010.

Band Number	Banding Site			Recapture Site		
	Location	Date	Age <sup>a</sup>	Sex <sup>b</sup>	Color	Date
0977-86569	Sagavanirktok River Delta	8/1/1993			White	Sag North Delta/Central Delta #2, AK
0807-63362	Deadhorse (28 mi east), AK	8/3/2001	ASY	F	White	Kadleroshilik Delta East (#1), AK
1937-13300	Kalubik Creek, AK	8/1/2008	AHY	F	White	Endicott Road East, Sag #2, AK
1847-03024	Eastern Ikpikpuk River Delta, AK	8/4/2007	AHY	F	White	Kadleroshilik Delta North (#2), AK
1847-03273	Eastern Ikpikpuk River Delta, AK	8/4/2007	AHY	F	White	West Howe Island/BRA8, AK
1847-03293	Eastern Ikpikpuk River Delta, AK	8/4/2007	AHY	M	White	West Howe Island/BRA8, AK
0977-24139	Western Ikpikpuk River Delta, AK	7/31/2002	AHY	F	White	Kadleroshilik Delta North (#2), AK
0867-24342	Western Ikpikpuk River Delta, AK	8/1/2002	AHY	F	White	West Howe Island/BRA8, AK
1587-53532	Western Ikpikpuk River Delta, AK	8/1/2003	L	F	White	Endicott Road East, Sag #3, AK
1847-01857	Western Ikpikpuk River Delta, AK	8/4/2006	L	M	White	Endicott Road East, Sag #3, AK
1847-02008	Western Ikpikpuk River Delta, AK	8/1/2007	AHY	M	White	West Howe Island/BRA8, AK
1557-07190	Banks Island, NWT	7/15/1998	AHY	M	White	Kadleroshilik Delta East (#1), AK
1587-48067	Banks Island, NWT	7/11/2002	AHY	M	White	Kadleroshilik Delta North (#2), AK
1587-47889	Banks Island, NWT	7/12/2002	AHY	F	White	Endicott Road East, Sag #3, AK
1587-49538	Banks Island, NWT	7/17/2003	AHY	M	White	Endicott Road East, Sag #3, AK
1847-10341	Banks Island, NWT	7/12/2006	AHY	M	White	Kadleroshilik Delta East (#1), AK
1557-63578	Northwest Territories	7/16/2001			White	West Howe Island/BRA8, AK
1727-52708	Nunuvut	7/25/2007	AHY	M	Blue	Sag North Delta/Central Delta #2, AK

a Age refers to age at time of banding: L = local, not flight-capable gosling; AHY = after-hatch year; ASY = after second year

b Sex refers to sex at time of banding: F = female, M = male