



# Yukon Flats National Wildlife Refuge Report Trumpeter Swan Survey, Yukon Flats, Alaska – 2016

Nikki Guldager

---



Photo by Jim Akaran

Yukon Flats National Wildlife Refuge  
101 12<sup>th</sup> Avenue, Room 264  
Fairbanks, Alaska 99701



February, 2017

## TRUMPETER SWAN SURVEY OF THE YUKON FLATS, ALASKA – 2016

---

*Data and conclusions presented in this report are preliminary and are not for publication or citation in published manuscripts without permission from the author.*

### INTRODUCTION

Statewide trumpeter swan (*Cygnus buccinators*) surveys have been conducted by U.S. Fish and Wildlife Service (USFWS), Division of Migratory Bird Management (MBM) every 5 years since 1975. During this time the trumpeter swan population in Alaska has increased exponentially (Conant et al. 2007, Schmidt et al. 2009). Yukon Flats has over 30,000 wetlands that are diverse in character relative to other areas in interior Alaska, from the ubiquitous black spruce bogs to brackish ephemeral wetlands surrounded by meadows of grasses and sedges. Though the swan population has expanded significantly in Yukon Flats, there are still many unoccupied wetlands. Continuing to monitor the Yukon Flats swan population will provide information on further expansion and habitat selection of trumpeter swans.

### STUDY AREA AND METHODS

From 1975 to 2010, trumpeter swan surveys were conducted every 5 years by Migratory Bird Management (MBM), USFWS. U.S. Geological Survey (USGS) quadrangles (quads 1:63,360 scale) maps were used as sample units, and 41 – 42 contiguous quads of the Beaver, Black River, Circle and Fort Yukon 1:250,000 sectionals were surveyed in 1995, 2005, and 2010 (Table 1, Figure 1), which included most of the trumpeter swan habitat in Yukon Flats. Coverage of Yukon Flats was limited prior to 1995 (Table 1).

A statewide census approach was used by MBM prior to 2010, and was changed to a random sample approach in an effort to conserve funds and time. The random design approach supports statewide population inferences; however, sample sizes do not support information on the trends, distribution, and habitat use of trumpeter swans using the Yukon Flats basin. In 2016, Yukon Flats NWR adopted a monitoring strategy which divided the study area into 5 strata, with the intent of surveying 1 strata per year with a 5 year monitoring interval for each strata. This approach allows for broad spatial coverage to capture the range of habitats, while also maintaining the same monitoring interval as previous surveys.

Survey methods were consistent with MBM statewide methods (Conant et al. 2007). All potential swan habitats (all still and flowing water) within the selected quads were searched for swans, and each observation was circled to verify the count (Figure 1). Observations were recorded as pairs, pairs with cygnets, singles, singles with cygnets, and flocks. Observations were linked to a Global Position System unit to provide location information for every observation.

Trumpeter swans were surveyed by pilot, Nikki Guldager and observer, Mark Bertram on 19, 22, and 23 August 2016 in a float equipped Cessna 185.

## **RESULTS AND DISCUSSION**

In 2016, 386 total swans were counted in the 6 quads, of which 120 were flocked adults and 34 were young of the year. Since 1995, the total number of adults and non-flocked adults counted within these quads increased 286% and 336%, respectively. The number of cygnets increased by 48 % between 1995 and 2016. This relatively low increase was driven by low counts in 2016 given there was a 330% increase between 1995 and 2010 (Table 3, Figure 3). Since 2010, total swans, paired/single adults, and flocked adults increased 32, 9 and 145 %, respectively, and cygnets decreased 66%.

The relatively large increase in flocked adults and the decrease in signets between 2010 and 2016 may indicate that surveys were late relative to swan phenology. Later survey dates allowed for higher signet mortality, and accounted for more flocked adults.

## **ACKNOWLEDGEMENTS**

We would like to thank Debbie Groves for providing previous year's data for comparison.

## **REFERENCES CITED**

- Conant, B., J.I. Hodges, D.J. Groves, J.G. King. 2007. Alaska trumpeter swan status report 2005. Waterfowl Management, U.S. Fish and Wildlife Service, Juneau, Alaska. Unpublished report. <http://alaska.fws.gov/mbsp/mbm/waterfowl/surveys/trswatl.htm>
- Schmidt, J.H, M.S. Lindberg, D.S. Johnson, B. Conant, J. King. 2009. Evidence of Alaskan trumpeter swan population growth using Bayesian hierarchical models. *The Journal of Wildlife Management*, 73(5):720-727.

Table 1. Number of adult trumpeter swans counted by survey map and year. Missing values indicate that the map was not surveyed.

Map	Quad	1975	1980	1985	1990	1995	2000	2005	2010	2016
Beaver	A1				0	6	10	27	16	
	A2				0	19	17	27	37	2
	A3				2	10	14	23	13	
	A4				4	3	19	24	46	68
	A5	0	0	6	4	36	40	94	83	111
	A6	2	2	2	2	6	13	13	18	38
	B1				4	1	7	6	18	
	B2				2	1	4	9	31	
	B3				0	2	14	16	36	
	B4			0	0	14	25	53	59	99
	B5			2	2	22	30	41	50	68
	C1							0	0	5
	C2					0	0	5	5	32
	C3					2	7	3	12	10
Black River	C5				2	0	7	8	20	
	C6				0	0	0	0	14	
	D5				2	0	4	2	3	
	D6				0	0	0	2	23	
Circle	D1				2	17	18	33	63	
	D2				2	8	5	8	10	
Fort Yukon	A1				0	0	2	9	6	
	A2				22	38	55	82	83	
	A3				2	13	26	38	40	
	A4				0	8	16	28	42	
	A5					0	2	10	15	
	A6					8	8	14	18	
	B3				0	0	2	0	4	
	B4					2	7	7	14	
	B5				0	3	0	25	7	
	B6				0	0	0	2	4	
	C1				0	0	2	0	0	
	C2				0	3	4	4	23	

Map	Quad	1975	1980	1985	1990	1995	2000	2005	2010	2016
Fort Yukon	C3					0	0	14	0	
	C4					3	18	44	23	
	C5				0	0	4	5	24	
	C6				2	0	0	0	8	
	D1				0	0	4	12	13	
	D2					0	0	0	3	
	D3					5	4	8	3	
	D4					2	6	12	27	
	D5				0	0	1	6	6	
D6				2	0	0	0	4		
<b>Total</b>		2	2	10	58	237	396	723	954	NA

Table 2. Number of trumpeter swan cygnets counted by survey map and year. Missing values indicate that the map was not surveyed.

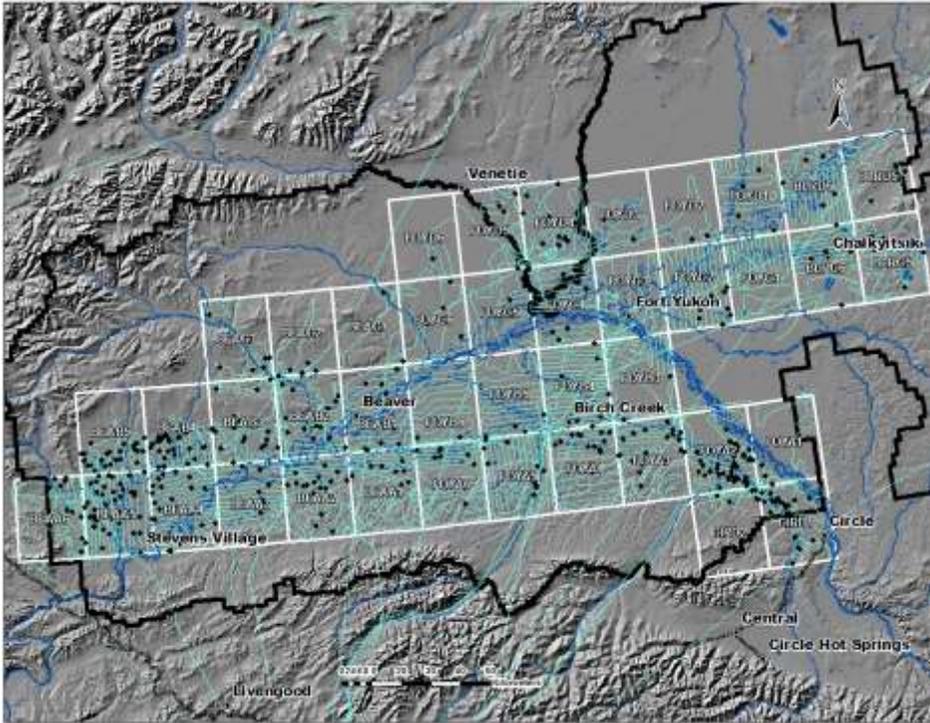
Map	Quad	1975	1980	1985	1990	1995	2000	2005	2010	2016
Beaver	A1				0	5	3	6	8	
	A2				0	8	10	6	1	0
	A3				0	0	3	6	0	
	A4				0	0	3	11	7	7
	A5	0	0	3	0	0	3	24	33	11
	A6	1	4	0	3	2	6	6	14	1
	B1				0	0	4	0	6	
	B2				0	0	0	4	19	
	B3				0	0	5	14	17	
	B4			0	0	7	2	23	31	9
	B5			0	2	6	10	14	13	6
	C1						0	0	0	
	C2				0	0	0	5	3	
	C3				0	0	0	9	4	
	Black River	C5				0	0	3	3	9
C6					0	0	0	0	10	
D5					4	0	3	4	0	
D6					0	0	0	0	0	

Map	Quad	1975	1980	1985	1990	1995	2000	2005	2010	2016
Circle	D1				2	5	8	7	10	
	D2				1	0	0	10	3	
Fort Yukon	A1				0	0	4	2	7	
	A2				6	15	24	18	13	
	A3				2	0	2	17	6	
	A4				0	3	3	6	19	
	A5					0	0	0	0	
	A6					0	2	3	0	
	B3				0	0	1	0	0	
	B4					0	0	0	5	
	B5				0	0	0	0	3	
	B6				0	0	0	0	0	
	C1				0	0	0	0	0	
	C2				0	0	0	0	4	
	C3					0	0	0	0	
	C4					0	0	0	0	
	C5				0	0	0	0	0	
	C6				0	0	0	0	2	
	D1				0	0	3	0	0	
	D2					0	0	0	0	
	D3					0	0	0	0	
	D4					3	0	0	9	
D5				0	0	0	6	5		
D6				0	0	0	0	0		
<b>Total</b>		<b>1</b>	<b>4</b>	<b>3</b>	<b>20</b>	<b>54</b>	<b>102</b>	<b>204</b>	<b>261</b>	<b>NA</b>

Table 3. Sum of adults and cygnets for flocked, paired and single Trumpeter Swans per survey year for the quads surveyed in 2016 (Beaver Quads A2, A4, A5, A6, B4 and B5).

	1975	1980	1985	1990	1995	2000	2005	2010	2016
Flocked adults					39	15	89	49	120
Paired adults/no cygnets			8	8	40	86	110	172	186
Paired adults w/cygnets	2	2	2	4	14	26	44	58	58
Single adults/no cygnets					7	17	8	12	18
Single adults w/cygnets							1	2	4
Total cygnets	1	4	3	5	23	34	84	99	34
Total adults	2	2	10	12	100	144	252	293	386

a)



b)

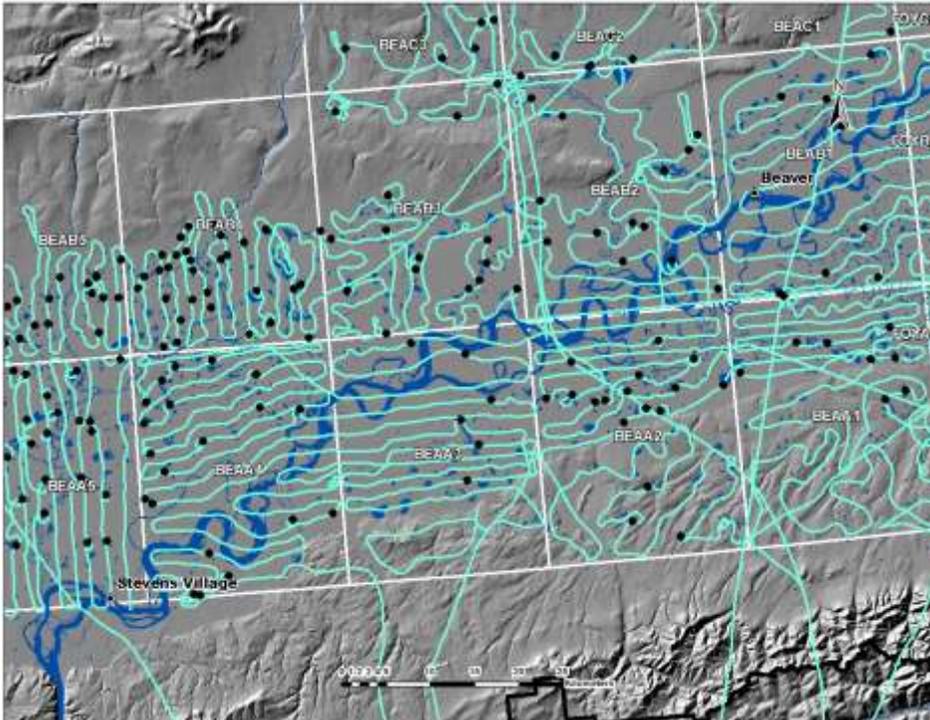


Figure 1. Map features of Yukon Flats with 1:63,360 quadrangle sample units, flight lines (light blue) and swan observation locations (black points) from the 2010 trumpeter swan survey: a) depicts the entire study area, and b) is enlarged as an example.

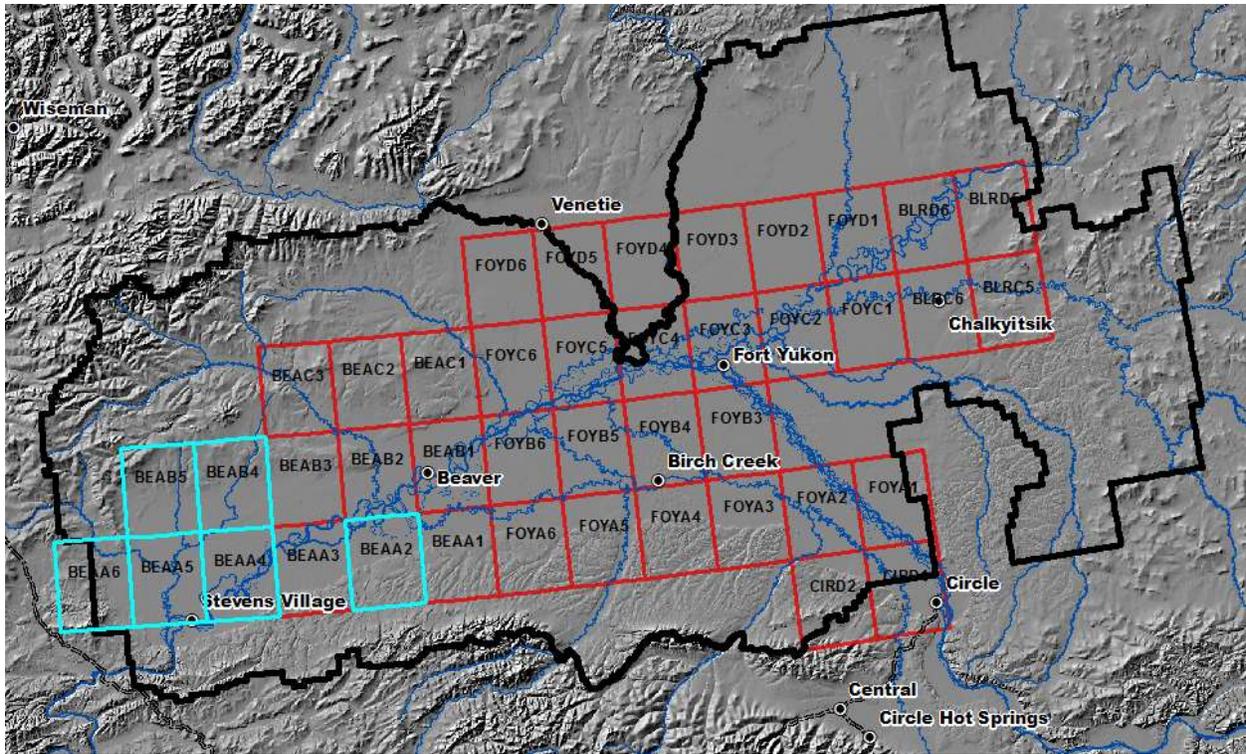


Figure 2. Map features of Yukon Flats with 1:63,360 quadrangle sample units. Units highlighted in blue are those completed in 2016.

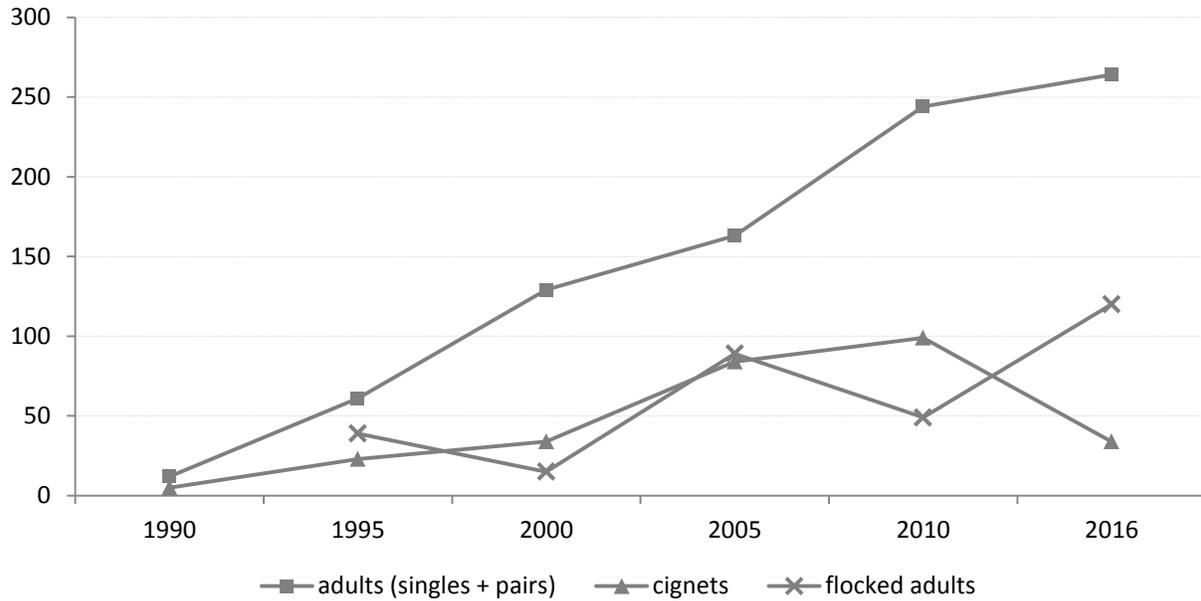


Figure 3. Total number of Trumpeter swans counted in 1995, 2000, 2005 and 2010 for the quads surveyed in 2016 (Beaver Quads A2, A4, A5, A6, B4 and B5).