

Preliminary Report

AERIAL VIDEOGRAPHY OF BRANT COLONIES ON YUKON DELTA NWR IN 1997

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Aerial surveys at five black brant colonies on the Yukon-Kuskokwim Delta--Kokechik Bay (KB), Tutakoke River (TR), Kigigak Island (KI), Baird Inlet Island (BI), and a peninsula northwest of Baird Inlet Island (BP) were conducted from 3-9 June. Good weather and improved procedures resulted in the most efficient data collection since the surveys began in 1991; survey flights were completed in 2.5 days. Two video camcorders sampled adjacent, non-overlapping transects from a Cessna-206 aircraft. Systematically spaced flight lines were established perpendicular to the gradient of nesting densities, which generally also was perpendicular to coastlines. The Global Positioning System (GPS) receiver in the aircraft was interfaced with a laptop computer via the RS-232 ports to navigate along each transect by displaying the location of the transect and the moving aircraft on the computer monitor. Sony color Hi-8 camcorders with 3 image sensors were used to sample brant. A GPS-linked, aircraft navigation and tracking computer program was used to record the track of the aircraft and boundaries of video transects. Weather conditions and lighting were good, generally with full sunlight to light overcast. Problems with navigation caused by strong winds in the afternoon required curtailing the survey on one of the three days of flying. Transects were spaced at 200-350 m intervals depending on the size of the colony. We flew at 150 m AGL at all colonies. Sixty-one transects (traversing

57.2 km) were flown at KB; 66 (83.3 km) ,47 (65.9 km), 26 (70.0 km), and 16 (65.9 km) were flown at TR, KI, BI, and BP, respectively. KB, TR, KI, BI, and BP required 2:18 (hours:minutes), 2:39, 1:21, 1:25, and 0:41, respectively, from start of first transect to end of last transect.

The location, status, and species of nests were determined by ground searches of 7 transects at KB, 5 transects at KI, and 9 transects at TR. The locations were mapped on large-scale color aerial photographs for later comparison with results of counts from video images. A crew of 3 worked at each colony for 1 day to map nests locations on selected transects.

GPS locations of transects from the aircraft tracking files were plotted on digitized topographic maps with MIPS (Map and Image Processing System) geographical information system. Total area in each colony was determined with the planimeter function in MIPS from GPS locations recorded during flight. Area sampled by each transect was computed from UTM (Universal Transverse Mercator) locations recorded by the flight tracking program at 1-second intervals during the surveys.

Video scenes were viewed independently by two observers in freeze-frame mode on a 50-cm video monitor. Data entry was streamlined by eliminating the need for input of nest locations with a computer program that extracted locations from the flight tracking files during post processing; codes describing detected nests required 3 digits. Transect number, time along transects (minutes, seconds, and video frame number), and nest-description codes were recorded on a Lotus 1-2-3 spreadsheet in Windows, which allowed concurrent control of the video recorder/player. Duplicate video viewing systems allowed observers to process video tapes simultaneously. Improved efficiency was achieved with the modified data entry format, dual

viewing systems, and more consistent image quality (Figure 1). Counting of nests by the two observers was completed in 13 days.

The total of estimates from all colonies (22,711) was similar to 1995 (22,740); however, numbers of nests in each colony was different from the 1995 survey (Table 1 and Figure 2), probably influenced by recruitment and a severe storm tide early in incubation that flooded many nests in low areas (i.e., Tutakoke River and Baird Island). Predation on nests at Tutakoke River also appeared to be higher than in recent years; 54 of 162 nests (33 percent) visited during ground-truthing in the northern portion of this colony, which was also affected by flooding, had no eggs. At Kokechik Bay 16 of 81 nests (20 percent) were destroyed. Only 1 of 114 nests was destroyed on Kigigak Island. Mean nest density was highest at KB (7.26 nests/ha) followed by TR (4.45), KI (4.01), BP (2.51), and BI (2.32).

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Table 1. Estimates from videographic aerial surveys of brant nests at five colonies-- Tutakoke River (TR), Kokechik Bay (KB), Baird Island (BI), Kigigak Island (KI), and Baird Peninsula (BP)--on Yukon Delta National Wildlife Refuge from 1992 to 1997.

COLONY	ESTIMATE					S.E.				
	1992	1993	1994	1995	1997 ²	1992	1993	1994	1995	1997
TR	4600 ²	4937 ²	4807 ¹	5596 ²	4588	202	190	400	297	554
KB	6134 ²	4667 ¹	6978 ²	7573 ²	9144	295	577	196	351	1092
BI	3258 ¹	4156 ¹	4461 ¹	4720 ¹	1944	347	357	454	474	242
KI	3440 ¹	1727 ²	2260 ²	---	4776	154	90	92	---	595
BP	2157 ¹	614 ¹	2441 ¹	2591 ¹	2259	151	77	142	184	282
TOTAL	19,589	16,101	20,947	22,740 ³	22,711					

¹ Estimates based on Lincoln-Petersen analysis of counts by two observers.

² Estimates based on correction factors from ground-truthed transects.

³ 1994 Kigigak Island estimate included in total.