

## Summary Report

### AERIAL VIDEOGRAPHY OF BRANT COLONIES ON YUKON DELTA NWR IN 1998

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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 9-17 June. Despite initial delays with minor aircraft repairs, good weather and lighting conditions resulted in the most efficient data collection since the surveys began; survey flights were completed in 2 days. Two Sony digital video camcorders sampled adjacent, non-overlapping transects from a Cessna-206 aircraft. Sampling protocol followed that of recent years. 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. A GPS-linked, aircraft navigation and tracking computer program was used to record the track of the aircraft and boundaries of video transects. Lighting conditions were good, with light overcast, which produced uniform brightness without shadows. Transects were spaced at 200-350 m intervals depending on the size of the colony. We flew at 122 m AGL at 113-145 km/hr over all colonies. Sixty-one transects (traversing 48.9 km) were flown at KB; 62 (87.9 km), 49 (68.6

km), 24 ( 57.3 km), and 16 (75.4 km) were flown at TR, KI, BI, and BP, respectively. KB, TR, KI, BI, and BP required 2:28 (hours:minutes), 2:57, 1:39, 1:35, and 0:48, 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 7 transects at TR. A total of 192 nests were mapped to determine detection rates by observers. 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 in freeze-frame mode on a 50-cm video monitor independently by two observers. Due to excellent lighting conditions and improved camera technology images were consistently good among all colonies. Transect number, time along transects (minutes, seconds, and video frame number), and nest-description codes were recorded on a spreadsheet in Windows, which allowed concurrent control of the digital camcorder. Images with brant nests were digitized instantaneously and saved to file for later inspection, using Sony's camera-computer interface. Duplicate video viewing systems allowed observers to process video tapes simultaneously. Good efficiency was achieved with a streamlined data entry format, dual viewing systems, and consistently high image quality (Figure 1). Counting of nests by the two

observers was completed in 12 days.

The total of estimates from all colonies (16,386) was 80% of the mean total from 1992-1997 (20,418); numbers of nests were reduced at all colonies except Baird Island (Table 1 and Figure 2), which had unusually low nesting due to late flooding in 1997. Predation on nests did not appear to be significant at any colonies. Only 7 of 423 nests examined during searches to ground truth video were destroyed. Mean nest density was highest at KB (5.94 nests/ha) followed by BI (4.34), TR (3.90), KI (3.73), and BP (1.72).

Acknowledgments--Funding for this survey was provided by U.S. Fish and Wildlife Service, Migratory Bird Management Office, Region 7. Aircraft and logistic support was furnished by Yukon Delta National Wildlife Refuge. Sea Lion Corporation provided access to their lands at Kokechik Bay for ground-truthing videography.

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 1998.

COLONY	ANNUAL ESTIMATE						S.E.					
	1992	1993	1994	1995	1997 <sup>2</sup>	1998 <sup>2</sup>	1992	1993	1994	1995	1997	1998
TR	4,600 <sup>2</sup>	4,937 <sup>2</sup>	4,807 <sup>1</sup>	5,596 <sup>2</sup>	4,588	3,448	202	190	400	297	554	292
KB	6,134 <sup>2</sup>	4,667 <sup>1</sup>	6,978 <sup>2</sup>	7,573 <sup>2</sup>	9,144	5,655	295	577	196	351	1092	471
BI	3,258 <sup>1</sup>	4,156 <sup>1</sup>	4,461 <sup>1</sup>	4,720 <sup>1</sup>	1,944	2,747	347	357	454	474	242	264
KI	3,440 <sup>1</sup>	1,727 <sup>2</sup>	2,260 <sup>2</sup>	---	4,776	3,105	154	90	92	---	595	238
BP	2,157 <sup>1</sup>	614 <sup>1</sup>	2,441 <sup>1</sup>	2,591 <sup>1</sup>	2,259	1,431	151	77	142	184	282	169
TOTAL	19,589	16,101	20,947	22,740	22,711	16,386						

<sup>3</sup>

<sup>1</sup> Estimates based on Lincoln-Petersen analysis of counts by two observers.

<sup>2</sup> Estimates based on correction factors from ground-truthed transects.

<sup>3</sup> 1994 Kigigak Island estimate included in total.

Figure 2. Annual estimates of numbers of nests in five brant colonies on Yukon Delta National Wildlife Refuge from 1992-1998.