

MBM

Memorandum

To: Chief, Migratory Bird Management

From: William Eldridge, Wildlife Biologist  
Karen Bollinger, Pilot/Wildlife Biologist

Subject: Report to the Pacific Flyway Study Committee on 1986-2007 Breeding Ground Survey Preliminary Results for Dusky Canada Geese on the Copper River Delta, Alaska.

## **INTRODUCTION AND METHODS**

The Copper River Delta dusky Canada geese survey was conducted on 16-17 May, 2007 for the 22nd consecutive year by the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Anchorage, Alaska. The 2007 aerial survey was comparable in timing to other recent and normal years. The northern East Delta and Castle Island had a higher percentage of snow or ice cover than in recent years but probably not to an extent that affected population results significantly.

Standard U.S Department of Interior survey techniques were used as in previous years. A Cessna 206 on amphibious floats was flown along east-west transect lines (Fig. 1) at an altitude of approximately 45 m and an airspeed of 150 km/hr. Pilot and right-seat observer counted geese and swans to a distance of 200 m from the plane. Observations were recorded directly into a laptop computer connected to the airplane Global Positioning System, so each observation received a coordinate location. The same flight lines have been used since 1997 (Fig. 1).

No surveys were conducted of the Bering Glacier area this year.

### **Population Indices**

The method of calculating population indices was changed in 2004 to standardize all goose surveys for Alaska. Indices from all previous years of this survey were re-calculated using this methodology. Population indices used in this report include some changes to the table presented in 2004.

The population indices used in Table 1, including all data from 1986-2006, are as follows:

$$\begin{aligned}\text{Indicated Total Birds} &= 2 \times (\text{singles} + \text{pairs}) + \text{birds in flocks} \\ \text{Indicated Pairs} &= 2 \times (\text{singles} + \text{pairs})\end{aligned}$$

These indices are based on the assumption that a single goose observed represents a pair, with the unseen mate on a nest, so therefore the single observations are doubled to account for the pair. The word "pairs" refers to the number of pairs observed.

### **Conversion of Population Indices to Estimated Population**

The 2007 Dusky Canada Goose Management Plan detailed the methodology to convert the aerial survey population indices to a population estimate. Basically, the number of pairs determined from the aerial survey are converted to an estimated population of paired birds based on the number of nests/ aerial observation of paired birds, determined from random ground plot nest searches every 3 years. This conversion factor will be updated as a moving average. Flocked birds observed from the air, expanded by area, are added to the total. In addition, dusky Canada geese counted on Middleton Island are added to the estimate. A list of the aerial observation indices, reported annually in this memo, will be presented with the converted total population estimate in a separate document at a later date.

### **Stratification**

Stratification is based on sampling intensity as measured by distance between transects. The three strata with different sampling intensities are: 1) West Delta, 2) East Delta, and 3) Egg Island (Fig. 2). The majority of the population estimate is derived from the West Delta, which is sampled at .5 mile intervals between transects.

Because each observation has a coordinate position associated with it, we can stratify the Copper River Delta by any method including habitat and goose densities. However, for purposes of Flyway population management the indices presented in Table 1, based on 3 strata, will be the standard for flyway management.

## **RESULTS AND DISCUSSION**

Population indices for all years are presented in Table 1 and Fig 3. The indicated total bird index continued to decrease at about 3 percent per year, and was the lowest recorded since the survey began (Table 1., Fig. 3). The indicated pairs index decreased as well and was one of the lowest recorded during the history of the survey (Table 1, Fig. 3). The population trends, based on

average annual growth rates, remain negative although regression coefficients are weak (Fig. 3). However, data from the last eight years, while variable, indicate that the population decline may have decreased or that the population is maintaining.

This is a difficult survey due to visibility complications from a complex habitat and the behavior of dusky Canada geese which cause them to remain standing, or even hide, rather than fly. We have seen significant differences in indices between experienced pilot and right seat observers in the past and do not necessarily expect that they will be close, particularly with flocked birds which are highly variable. Changes in observers and pilots have been accompanied by reduced numbers recorded on the side of the change, but generally improve with experience. In 2007 an experienced pilot flew the survey for the first time with a long-term observer on the survey. Because the ratio of pilot/observer observations was similar to other recent years involving the observer, both pilot and observer observations were included in the analyses.

#### **ACKNOWLEDGEMENTS**

We would like to thank the staff of the U.S. Forest Service in Cordova for providing logistical support for this survey.

#### **LITERATURE CITED**

Pacific Flyway Council. 2007. Pacific Flyway management plan for the dusky Canada goose. Dusky Canada Goose Subcomm., Pacific Flyway Study Comm. [c/o USFWS], Portland, OR. Unpubl. rept. xxpp.+ appendices.

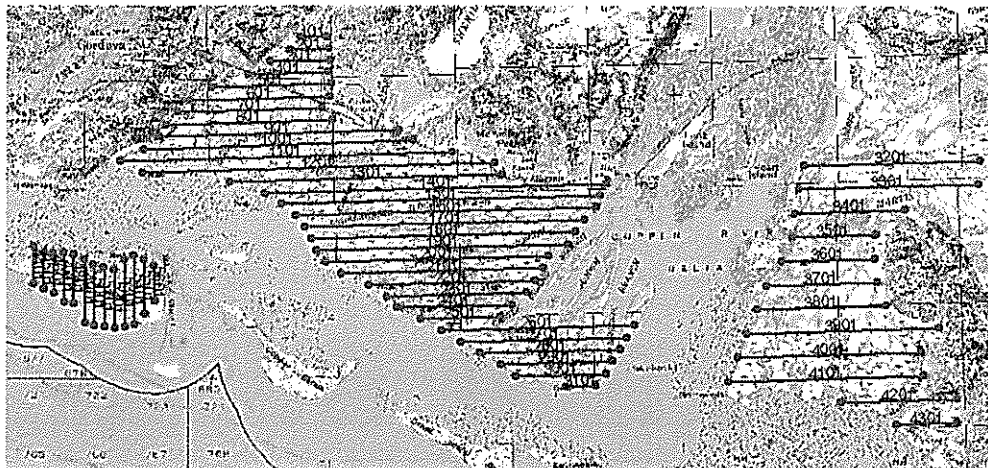


Figure 1. Flight lines for the dusky Canada Goose aerial survey on the Copper River Delta.

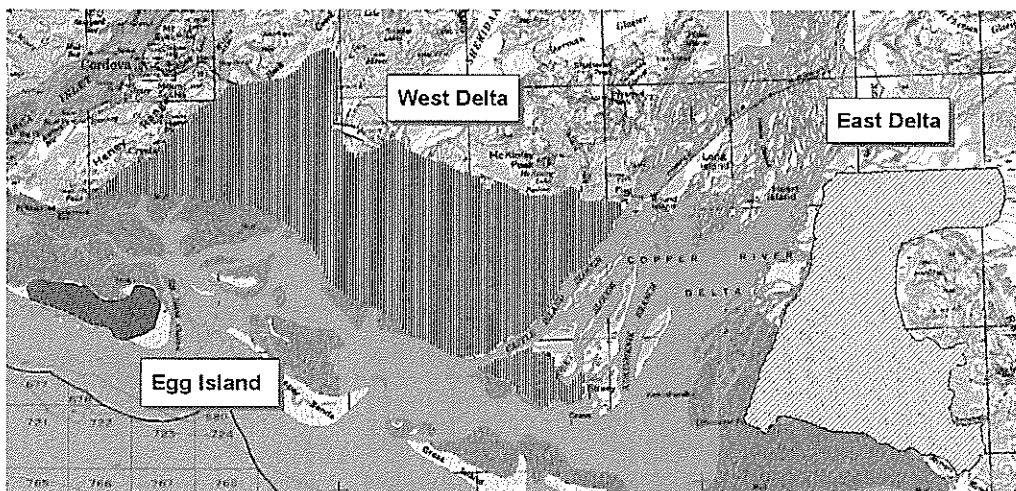
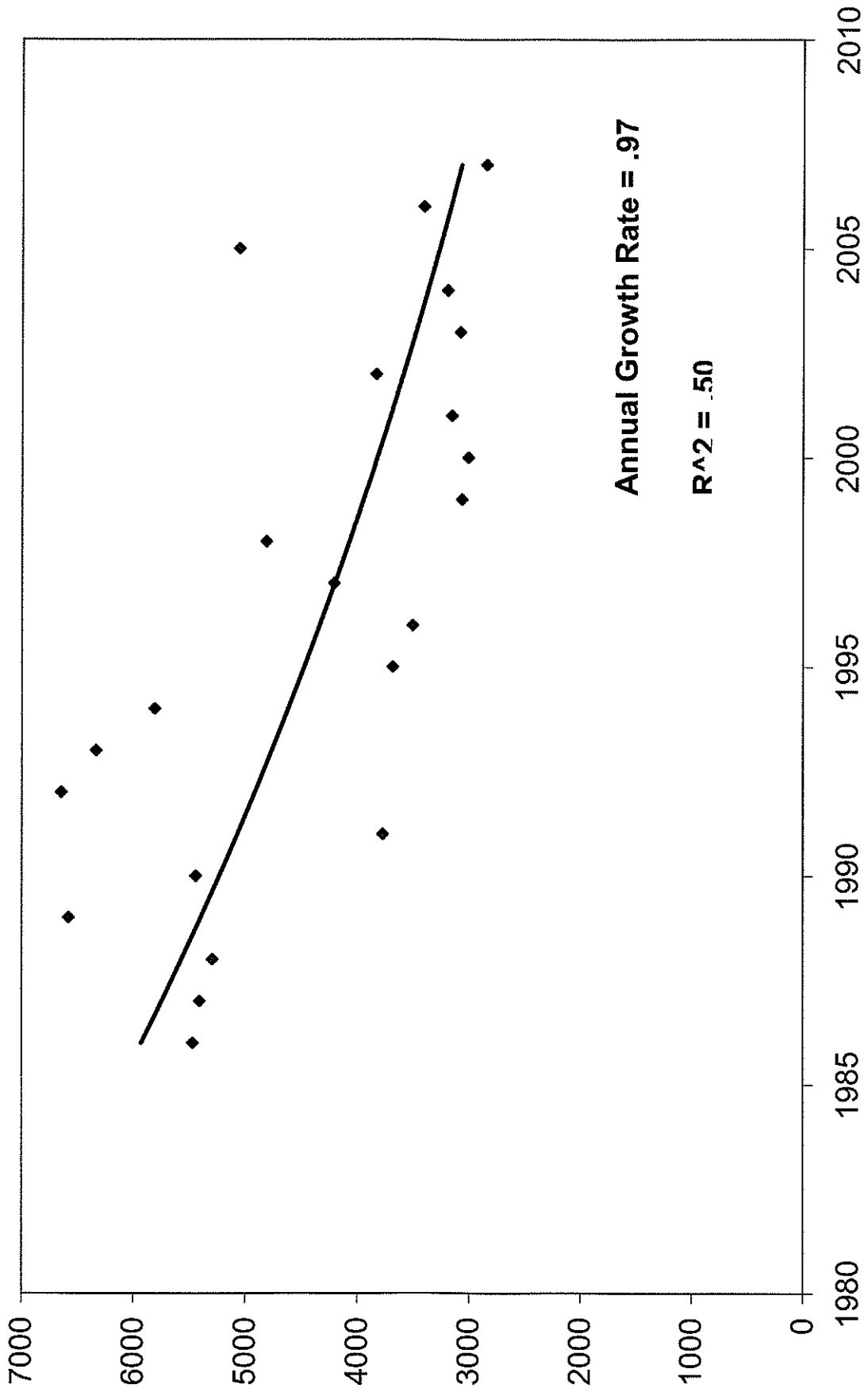


Figure 2. Current Copper River Delta stratification based on sampling intensity (distance between transects).

# Dusky Geese Total



# Dusky Geese - Singles and Pairs Doubled

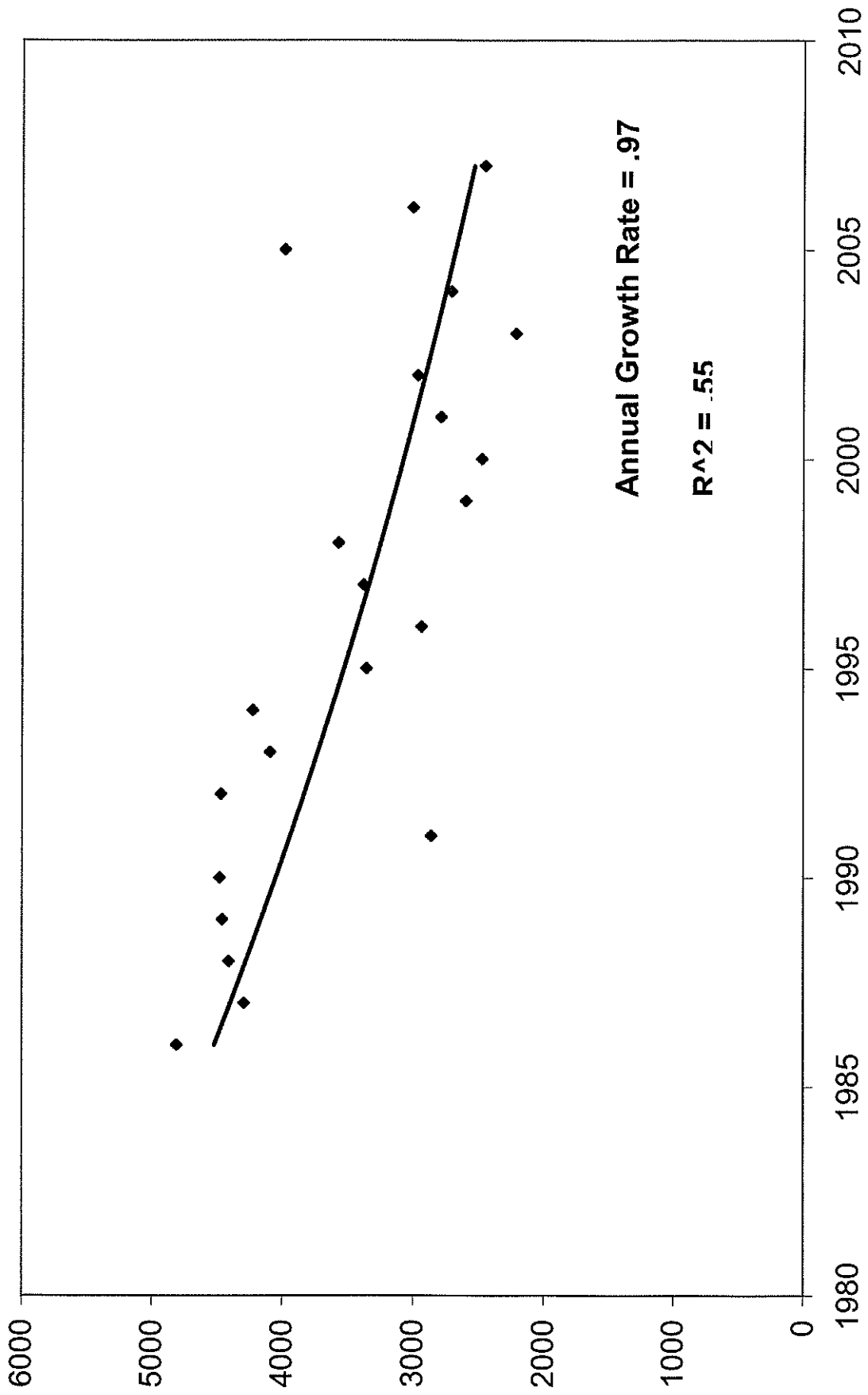


Table 1. Indicated pairs and indicated total bird population indices for dusky Canada geese on the Copper River Delta, 1986 to 2005.

	Indicated Pairs		Indicated	
	Index	SE Pairs	Total Index	SE Total
1986	4,811	389	5,469	356
1987	4,294	409	5,408	504
1988	4,412	325	5,296	364
1989	4,463	369	6,582	565
1990	4,482	457	5,442	669
1991	2,861	356	3,773	437
1992	4,472	284	6,648	835
1993	4,096	265	6,334	495
1994	4,226	253	5,810	432
1995	3,357	250	3,685	323
1996	2,936	190	3,509	267
1997	3,379	176	4,208	271
1998	3,571	203	4,814	350
1999	2,599	174	3,068	224
2000	2,477	128	3,009	184
2001	2,788	181	3,157	202
2002	2,966	173	3,836	294
2003	2,215	129	3,083	222
2004	2,712	190	3,198	235
2005	3,986	418	5,050	614
2006	3,006	301	3,412	326
<b>2007</b>	<b>2,456</b>	<b>157</b>	<b>2,848</b>	<b>188</b>

Indicated Pairs Index = 2 x (singles + pairs)

Indicated Total Index = 2 x (singles + pairs) + birds in flocks