

A POPULATION ESTIMATE OF TUNDRA SWANS ON WESTERN  
ALASKA NESTING HABITATS - 1991

Preliminary Report

Migratory Bird Management  
U.S. Fish and Wildlife Service  
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Western Alaska annually summers the bulk of the western population of Tundra Swans (Cygnus columbianus) wintering in North America. The U.S. Fish and Wildlife Service completed the first coordinated, random plot survey for this area during August of 1991. The survey method used fixed, high wing aircraft to conduct a complete search of a simple random sample of 1/5 of the 1735 quarter sections of 1:63,360 scale U.S. Geological Survey maps thought to contain swan habitat plus all 30 quarters on Kodiak Island (Figure 1). All swan sightings were recorded directly onto maps by position, number and category. A more complete report with further analyses will follow.

A little over 400 hours of flight time was invested by many dedicated pilots and biologists to gather this data. We gratefully acknowledge the assistance of the following organizations in providing survey crews and/or logistical support: Alaska Peninsula/Becharof NWR, Izembek NWR, Kanuti NWR, Kodiak NWR, Selawik NWR, Togiak NWR, Yukon Delta NWR, Migratory Birds-Anchorage, Migratory Birds-Fairbanks, Bering Land Bridge National Preserve, Cape Krusenstern National Monument, and Katmai National Park. The population estimates by category at the 95% confidence level were as follows: 45,924  $\pm$  10% singles and paired; 16,239  $\pm$  26% in flocks of three or more; 62,162  $\pm$  13% white swans; 19,938  $\pm$  18% cygnets; 82,101  $\pm$  14% total swans; 2.9 average brood size; 24% juvenile; and .34 broods per pair. The preliminary results are presented by survey area in Table 1.

A stratification of the habitat should decrease the confidence intervals of the estimates. Some swans were missed and the true population was probably slightly greater. A small but unknown proportion of swans recorded were probably Trumpeter Swans. A similar survey is anticipated for the remainder of the Tundra Swan habitat in North America.

Data collected during the 1991 survey are being digitized and will be added to the Alaska swan data base. The swan data storage and retrieval system is in the process of being converted to the ARC/INFO Geographical Information System. Data and map products will be available from a computer through Bob Leedy, Migratory Bird Management Office, U.S. Fish and Wildlife Service in Anchorage.

Table 1. Western Alaska tundra swan sample estimates from 376 quarter USGS 1:63360 scale maps.

			Adults and Subadults				Total Swans	Number of Broods	Average Brood Size	Percent Juvenile	Broods per Pair		
			in Pairs	as Singles	Singles + Pairs	in Flocks						Subtotal	Cygnets
BRISTOL BAY	N = 701	n = 139											
Total Population			7071	751	7822	2037	9859	2370	12230	817	2.9	19	0.23
95% Confidence Limit (+/-)			1312	167	1323	896	1987	531	2517	179			
Percent Error			19	22	17	44	20	22	21	22			
YUKON DELTA	N = 631	n = 126											
Total Population			27233	4452	31685	9856	41541	15124	56665	5153	2.9	27	0.38
95% Confidence Limit (+/-)			3946	785	4023	3630	7513	3465	10977	1032			
Percent Error			14	18	13	37	18	23	19	20			
SEWARD-KOTZEBUE	N = 403	n = 81											
Total Population			5801	552	6353	4319	10672	2418	13090	876	2.8	18	0.30
95% Confidence Limit (+/-)			1221	149	1230	1833	2779	801	3580	275			
Percent Error			21	27	19	42	26	33	27	31			
KODIAK	N = 30	n = 30											
Total Population			60	3	63	27	90	26	116	10	2.6	22	0.33
GRAND TOTAL	N = 1765	n = 376											
Total Population			40165	5759	45924	16239	62162	19938	82101	6856	2.9	24	0.34
95% Confidence Limit (+/-)			4334	816	4410	4164	8253	3596	11848	1083			
Percent Error			11	14	10	26	13	18	14	16			

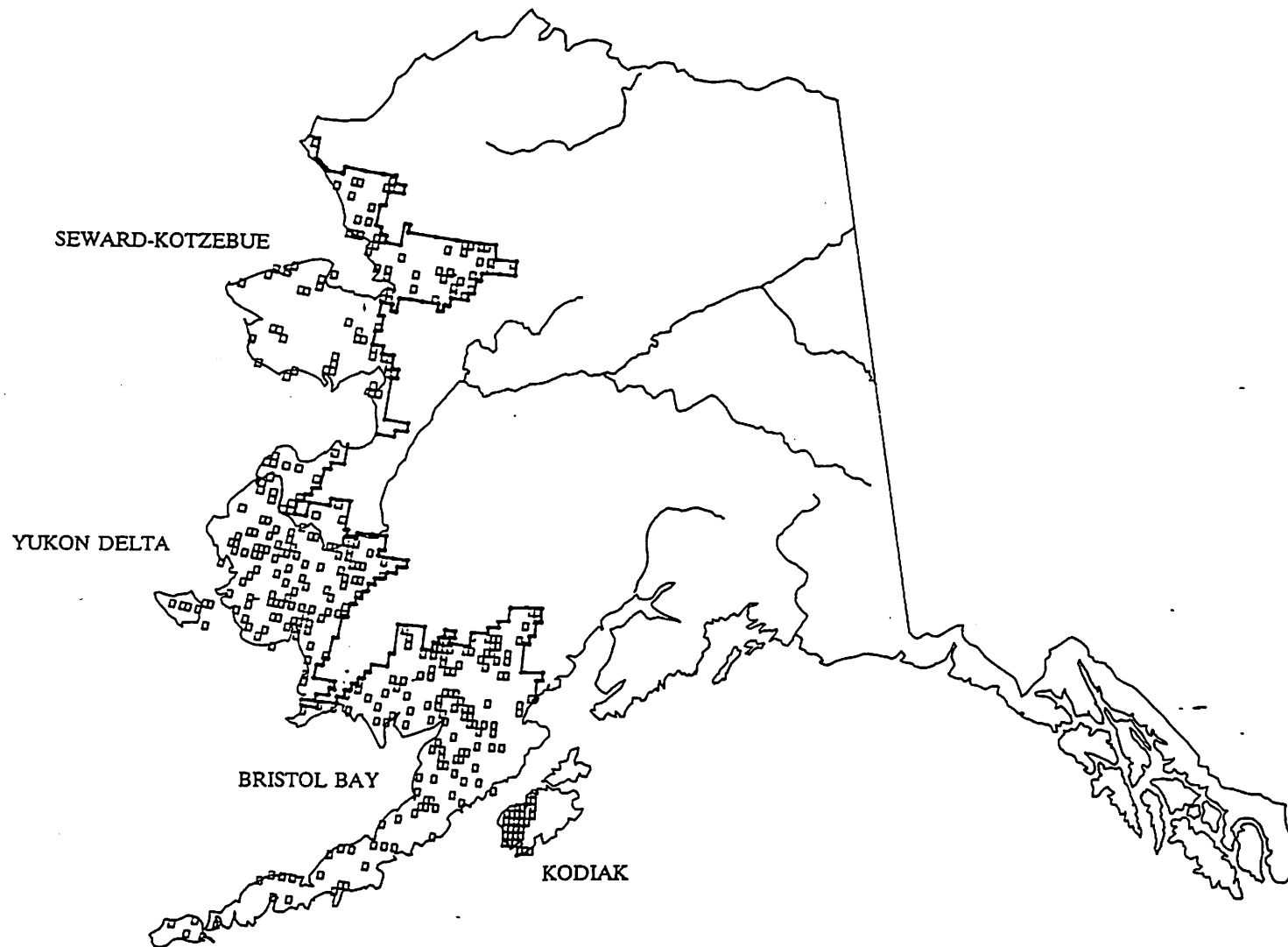


Figure 1. Locations of 376 quarter USGS 1:63,360 scale maps surveyed for Tundra Swans in 1991.