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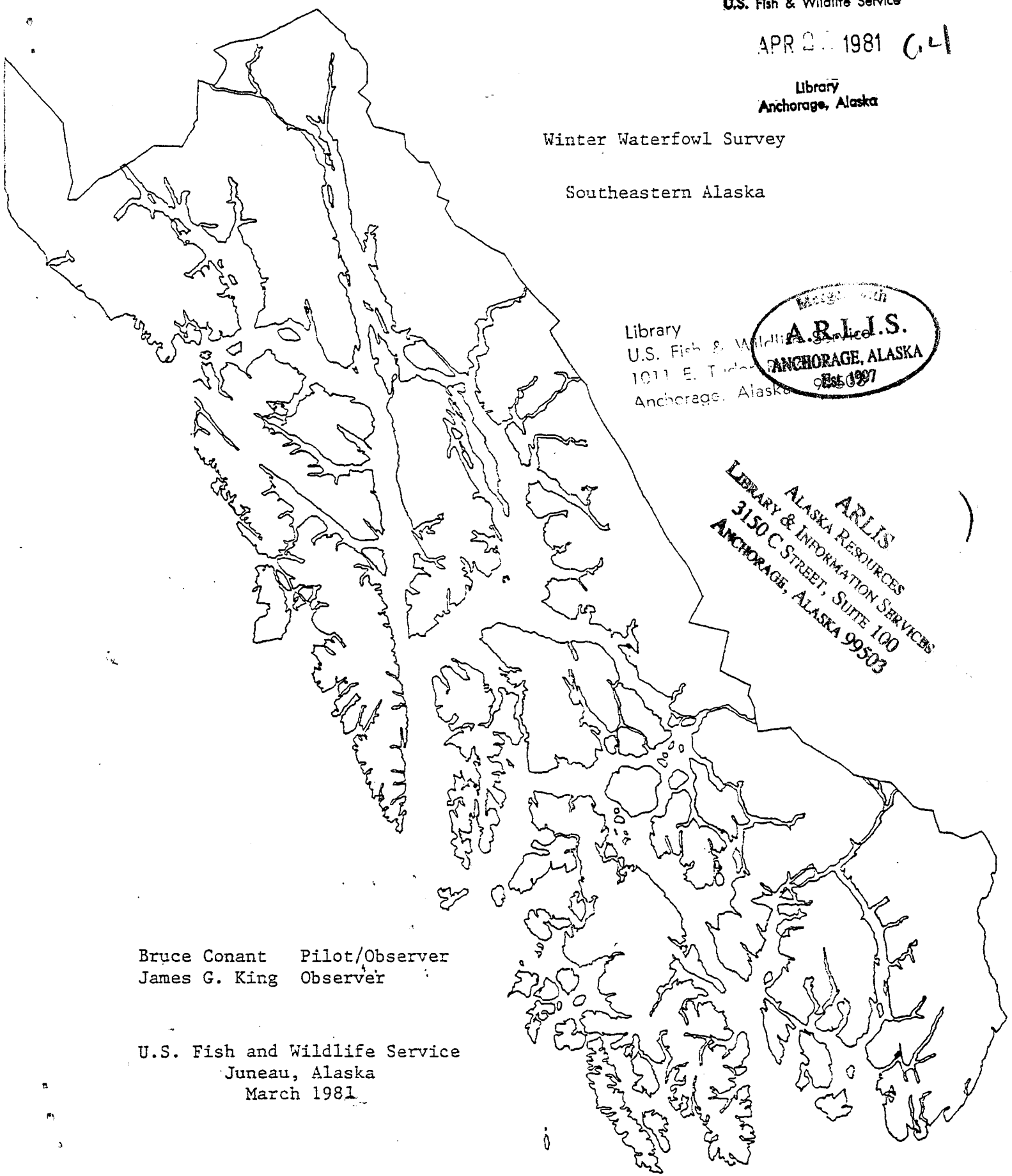
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Winter Waterfowl Survey

Southeastern Alaska



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## Abstract

Little is known of the total numbers of wintering waterfowl within the north pacific coastal region. The random stratified plot sampling method used in 1980 was modified and the study area expanded to include all the saltwater habitat in northern southeast Alaska. We found a wintering duck population (uncorrected for visibility rates) of 151,602 + 45% (95 percent significance level) with scoter 35.4%, goldeneye 22.1%, mallard 16.5%, and others 26.0%. Other bird and sea mammal population estimates are given. Useful waterfowl population information can be gathered with the plot method. Reliable visibility correction factors need to be determined concurrently with surveys. Survey expansion is recommended.

## Introduction

Little is known of the total numbers of wintering waterfowl within the north pacific coastal region. There has been no standardized, systematic approach to fill this information gap. In February and March 1981 we continued experimental air surveys to tabulate wintering birds in coastal habitats of southeast Alaska. We believe we now have a method that can be used anywhere from Puget Sound to the Aleutians to fill this need. Additional surveys (helicopter, boat, ground) will be needed to determine visibility rates for standard air observations.

## Methods

Our effort in 1981 was a modification of the random stratified plot sampling scheme used in 1980 (Conant et al. 1980)<sup>1</sup>. We simplified plot design and selection by basing our system this year on the standard U.S. Geological Survey (U.S.G.S.) quadrangle map series. The study area was expanded to northern southeast Alaska (Fig. 1), a cross section of north pacific coastal habitat including mainland coast, islands, and outside open ocean coast, to better test the usefulness of the method.

Quarter sections of U.S.G.S. quadrangle (1:63,000) maps were used for plots. These are only slightly smaller (approximately 54 square statute miles) than the plot size used last year and are simple to delineate for planning and flying the survey. All quarter sections containing saltwater habitat within the study area were consecutively numbered and stratified into low, medium, and high categories based on expected duck numbers (Table 1). A random set of plots were selected utilizing maximum allocation of effort (Appendix).

The coastline was flown within sample plots to count all birds within 1/4 statute mile of the waterline. The aircraft followed a track about 1/8 statute mile offshore at an altitude of 150 feet at 100 mph. Both pilot and observer counted

1 Conant, B., R.J. King, J.I. Hodges, and J.G. King. 1980. A winter waterfowl survey in southeastern Alaska. U.S. Fish and wildlife Service report, unpublished. 7 pp.

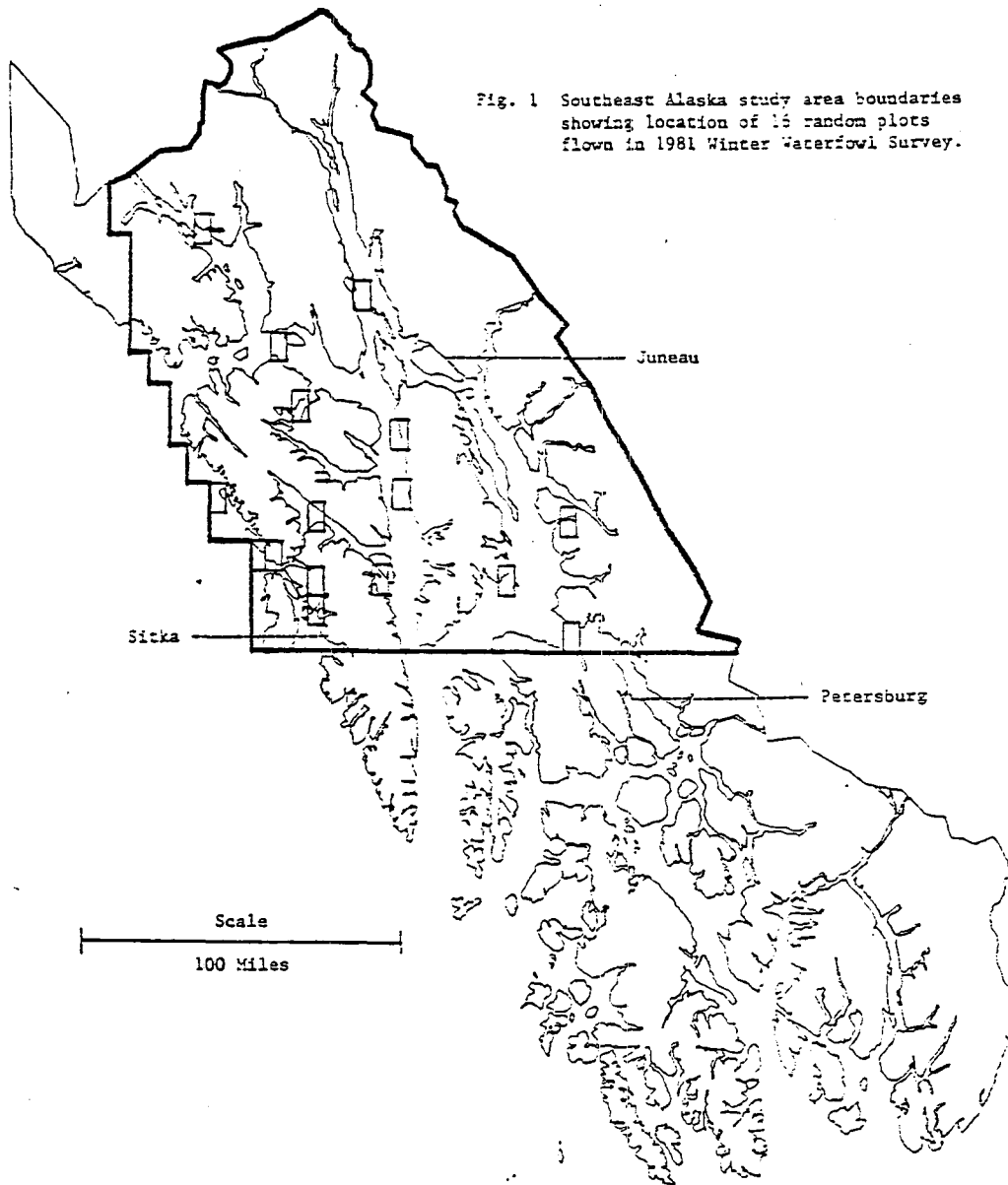


Table 1. Survey Design - Winter Waterfowl Survey, Northern Southeast Alaska, 1981.

	Low	Stratum, Medium	High	Total
Stratum Size(Plots) <sup>1</sup>	135	107	27	269
Sample Size	4	7	5	16

<sup>1</sup> Each plot is a quarter section of a standard U.S.G.S. quadrangle map (approximately 54 square statute miles).

birds, but the majority were recorded by the observer, as he was always placed on the beach side of the flight path. Extensive tidal flats at heads of bays and elsewhere within plots were also included.

Birds within the saltwater area outside of 1/4 mile of the waterline were either; counted directly where the water area was small; sampled with 1/4 statute mile wide transects flown on each minute of latitude and then expanded for that plot; or a combination of these two methods. This provided a population estimate for open saltwater habitat by plot.

Combining the shoreline and open water estimates yields a bird population for total saltwater habitat within each plot. No attempt was made to count birds in the freshwater habitat in plots as it is usually frozen and unavailable in winter.

The survey was flown on February 23 and March 10, 12, and 16. By March 16 there was still no evidence of spring migration. However, some Canada geese had left the saltwater habitat to investigate nearby uplands where they nest. The specially modified U.S. Fish and Wildlife Service turbo beaver(N-754) on amphibious floats was again used making for a safe and efficient survey. A total of 20.5 hours were flown on the survey of which 6.2 were along shorelines, 4.5 in open water, for a total of 10.7 hours on plots. Data was recorded on portable tape recorders and transcribed to forms designed for computer input.

### Results

Population estimates derived from this survey were not adjusted with visibility correction factors to account for birds present, but not tallied from the air. Air survey work has shown that all birds present are not seen from the air and that this varies by species. Also, this survey was designed to measure ducks. Other species recorded were expanded only for added interest.

Expansion of the mean values by stratum provides a population estimate(95 percent significance level) for ducks for northern southeast Alaska as follows:

Species	Shoreline		Open Water		Total	
	numbers	percent	numbers	percent	numbers	percent
Mallard	23860	17.8	0	0.0	23860	16.5
Wigeon	0	0.0	0	0.0	0	0.0
Pintail	0	0.0	0	0.0	0	0.0
Goldeneye	31724	23.6	248	2.4	31972	22.1
Bufflehead	7722	5.8	76	0.7	7798	5.4
Scaup	283	0.2	0	0.0	283	0.2
Scoter	43632	32.5	7624	73.0	51256	35.4
Merganser	9889	7.4	430	4.1	10319	7.1
Harlequin	12859	9.6	0	0.0	12859	8.9
Old Squaw	4282	3.2	2063	19.8	6345	4.4
Total Identified	134251	100.0	10441	100.0	144692	100.0
Unidentified	6672		237		6909	
Total Ducks	140923		10678		151601 ± 45%	

Expansion of the mean values by stratum provides population estimates(95 percent significance level) for other species in northern southeast Alaska as follows:

Species	Shoreline		Open Water		Total	
	numbers	percent	numbers	percent	numbers	percent
Canada Geese	4193	92.5	338	7.5	4531 ±	69%
Gulls	25947	52.4	23596	47.6	49543 ±	57%
Cormorants	1092	18.4	4846	81.6	5938 ±	144%
Grebes	130	17.2	627	82.8	757 ±	151%
Loons	431	38.4	690	61.6	1121 ±	97%
Alcids	520	5.7	8610	94.3	9130 ±	123%
Shorebirds	22015	98.8	270	1.2	22285 ±	126%
Crows	29540	96.5	1075	3.5	30615 ±	53%
Sea Lions	1955	92.5	158	7.5	2113 ±	124%
Seals	596	99.2	5	0.8	601 ±	107%

### Discussion and Recommendations

Population estimates are low. All birds present within survey plots are not recorded from fixed wing aircraft. It is not possible to put the observer in a position from which he can see all birds. If it were possible, not all would be seen. Some dive, some fly away, some hide, some just blend into the background. Comparative air and ground surveys in prairie breeding areas have shown this for breeding pair surveys. For speculative purposes, if long term prairie correction factors are applied to our figures a population of about a half a million ducks results for northern southeast Alaska. Perhaps this is a more realistic population estimate than our uncorrected figures. Correction factors need to be determined concurrently with winter plot surveys. Helicopter, boat, or ground surveys or combinations of these could provide better correction factors.

Even without correction factors, this is a method which can provide useable data on the numbers of wintering waterfowl in the north pacific coastal region. A 30 percent reduction in the confidence limits for total ducks can be expected by doubling the number of plots for a given area. Given normal weather, the Juneau survey crew could complete a survey of all of southeast Alaska with this method by the mid-March deadline for a winter population estimate. The system could be used anywhere along the coast where birds winter.

Appendix

Random Plots, Northern Southeast Alaska Winter Waterfowl Survey, 1981.

Number	Quarter Section	Quadrangle Map
Low		
29	SE	Mt. Fairweather D-2
134	NE	Sitka D-3
171	NE	Sitka C-3
265	SE	Sumdum A-5
Medium		
52	SE	Juneau C-4
77	SE	Juneau B-6
184	SE	Sitka C-5
199	NW	Sitka B-6
200	NE	Sitka B-6
220	SE	Sitka B-5
228	SW	Sumdum B-6
High		
113	SW	Juneau A-5
162	NW	Sitka C-7
195	SE	Sumdum C-5
222	SW	Sitka B-3
237	NE	Sitka A-5

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