

Corrected Tables
pp. 17, 18, 20

Trumpeter Swan Survey

Alaska - 1968



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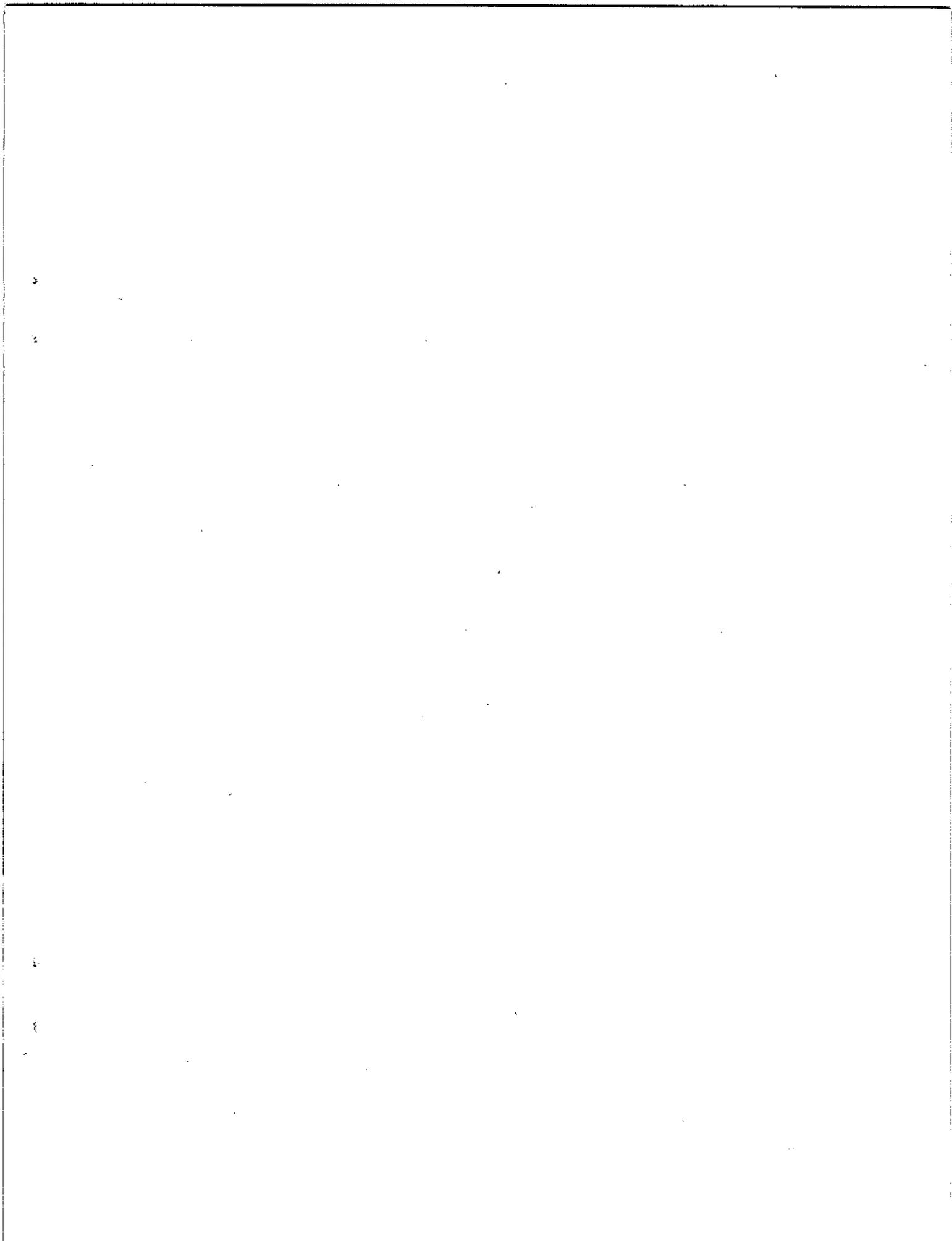


TABLE OF CONTENTS

	PAGE
Contents	1
Prologue	2
Acknowledgements	2
Methods	2
Population Structure	3
Distribution	5
Weather	6
Elevation	6
Habitat Survey	7
Miscellaneous Observations	10
Epilogue	14
Table 1 - Swan Population	17
" 2 Brood Sizes	18
" 3 Flock Sizes	19
" 4 May-August Comparison	20
" 5 Weather Data	21
" 6 Altitudes of Swan Sightings	22
" 7 Square Miles of Habitat	23
" 8 Survey Observers	24
" 9 Survey Flight Times	25
Figure 1 - Habitat Type Gulf Coast	26
" 2 " " Copper Canyon	27
" 3 " " Gulkana Basin	28
" 4 " " Fairbanks	29
" 5 " " Cook Inlet	30
" 6 " " Kenai	31
" 7 " " All Areas	32
" 8 - Map Total Alaska Breeding Habitat	33
" 9 " Gulf Coast	34
" 10 " Copper Canyon-Gulkana Basin	35
" 11 " Fairbanks	36
" 12 " Cook Inlet-Kenai	37
Appendix A - Survey Instructions	38
" B Survey Data Recording Sheet	43

Prologue

The most extensive and intensive Trumpeter Swan census ever attempted in Alaska was conducted in late summer 1968. A total of 2,844 trumpeters were tallied in six geographic areas. Locations of each observation were plotted on maps and data was recorded about each location. Four pilots and fourteen observers flew a total of 123.7 hours between August 13 and September 13 to complete the survey. Breeding trumpeters have been identified in six Alaskan areas outside the 1968 survey sections but it is felt that the bulk of the population was counted. It is known from past ground studies that the swans of the survey area are virtually all trumpeters.

Acknowledgements

The names of participants in the survey are listed in Table 8. They each deserve credit for a job well done. Special credit goes to Jim Bartonek for designing the recording form. Thanks are due Loyal Johnson of the Alaska Department of Fish and Game for letting us use the data from his May, 1968 counts in the Cordova area (Table 4) which correlated remarkably well with our August counts. This survey was done in part as a result of urging by Henry A. Hansen who had hoped to complete such a project before he left Alaska.

Methods

The basic instructions for the survey are included as Appendix A and the recording form Appendix B. The aircraft used were DeHaviland Beavers, Cessna 180's, a Piper Super Cub and on one day a Grumman Goose. A complete search was attempted of all eligible waters within each survey area.

Observations were made from 100 to 500 feet elevation. The flight path was recorded on 1-mile to the inch maps and the location of each observation referenced to the data sheet. The observations of swan numbers are very precise but the other information recorded on the data sheet was acquired by little more than a glance from the air and thus represents impressions more than precise information.

Every effort was made to record data and observations in such a way that this survey can be correlated with studies in the future. It would not be practical to include all maps and data sheets in a report of this nature but this material will be kept as a permanent record in the Juneau files and will be available to future investigators.

Population Structure

All swan observations are presented in Table 1. The structure of the population in each area was remarkably similar indicating similar breeding success for the entire population. We can only speculate as to the status of each category of birds.

Singles - These could be young unmated birds exploring; could be unmated birds holding a territory in hopes that a member of the opposite sex would join them; could be half a pair the other half of which is flying; or could be older birds who have lost their mate but continue to return to an old territory.

Pairs without broods - These birds appear to be occupying a territory. They could be young birds recently paired occupying a new territory; young pairs not on a territory or older birds that failed to nest or who lost a nest or young brood.

Flocks - Many of the birds sitting in flocks appear to be in loose pairs. These could be young birds forming pair bonds. Flocks could also include sexually immature birds, or senile birds, or batchelors resulting from any imbalance in sex ratio.

Broods - The average brood size is fairly consistent area to area showing only a slightly larger brood size on the Gulf Coast. The 257 broods (Table 2) averaged 3.59 young. It is interesting to compare this figure with 330 whistling swan brood observations made on the Yukon Delta September 1-8, 1968 that averaged 3.7 young. It has been assumed that trumpeter swans have somewhat larger broods than whistlers. This could be so ordinarily as 1968 was the highest whistling swan brood size in five years of records on the Yukon Delta reflecting an unusually good season.

We can speculate a bit that the normal condition for trumpeter swans is paired. The parental tie for the young probably breaks up some time during the first winter. The single and flocked birds observed may be in the process of pair formation. Any imbalance in sex ratio would have to add to the single or flocked category. If we consider the May count in the Cordova area (Table 4), it appears that some pair formation occurred during the summer as the number of pairs increased while the singles and flocked birds decreased. By fall we found 69% of all adult plumage birds were paired.

Less than half the paired birds raised broods. Possibly during the second summer birds pair then during the third summer they take up territories but do not nest and thereafter nest successfully periodically.

One other item of interest is indicated by the Cordova May count. Only

11.6% of the spring population was young of the previous year. This would indicate, if nesting success was comparable in 1967, that only about a third of the young trumpeters survive their first winter.

Distribution

Figure 8 shows the general distribution of trumpeter swans in Alaska and Figures 9 through 12 show the areas surveyed in greater detail. In general the water areas used by trumpeters are geologically new. The bulk of the population is associated with recent glaciation and use shallow ponds on outwash plains and are frequently found almost to the foot of active glaciers. The Fairbanks area has not been recently glaciated but the ponds are also new as the result of the meanderings of large rivers.

We have records of trumpeter swans nesting on the Fort Yukon Flats, the Koyukuk valley, the Stoney River below McGrath and at Haines in southeast Alaska. A mid summer check near Haines and also on the Yukon Flats disclosed no swans in these areas this year although the entire area was not covered. The Koyukuk and Stoney River had broods but we assume the populations were small. These unsurveyed areas (Figure 8) do constitute room for possible expansion of the population.

We have several observations from the Yukon Delta of floating swan nests that look like trumpeter nests. Whistling swan which are abundant here nest on dry land. In 1968 Cal Lensink of the Clarence Rhode National Wildlife Range caught a brood of trumpeters near Chevak on the Yukon Delta. We have no way of telling at present how extensive trumpeter distribution on the Yukon Delta is. There are old records of trumpeter swans from the

Kobuk River and unconfirmed reports from the Alaska Peninsula. If trumpeters are mixed with whistlers in these tundra areas it will be difficult to determine their numbers.

Density - Rough estimates of density are given in Table 7 (sq. mi. per swan) and Table 9 (swan per flying hour). Because all eligible waters were scanned the indications are that density relates rather directly to the number of water areas. For instance, in Cook Inlet the lowest number of swan per hour were recorded yet the highest number of square miles per hour were covered, indicating this area has the lowest number of eligible water areas. Dry terrain, of course, can be checked faster than lands dotted with lakes.

Weather

Comparative weather data for the trumpeter nesting areas is given in Table 5. It is interesting to note a 122-inch spread in the annual rainfall figures between the wettest and driest areas. The difference in the summer rainfall is a lot less, around 20 inches. Mean temperature data during the summer months shows a spread of 7 degrees, not drastically different for the different survey areas. Freeze data indicate there is probably a minimum of 145 days available for swan production in the Fairbanks area and more in other locations.

Elevation

In Table 6 we have a summary of elevations at which swan were observed in each survey area. The highest were found in the Gulkana basin and they were nesting almost to the upper limits of sparse spruce forests at 2700 feet. There are no trees above 3000 feet in this area. The great bulk of the

entire population of trumpeter swan in Alaska is found under 500 feet.

Habitat Survey

A form (Appendix B) was filled out for each observation of swans.

Obviously it is not possible to completely analyze the habitat type at a glance from the air so the data represent impressions. Also different observers have different impressions of the same waters and what might be called a pothole by one would be called a muskeg pond by another. It was not possible to make a determination in every case for every category on the form, thus the figures represent minimum occurrence only. In some cases totals do not add up to 100% as in the case of deep versus shallow ponds. There was, of course, no data for birds tallied in the air.

The habitat data is summarized in Figures 1 to 7. The data was totaled, reduced to percent and plotted to the nearest 10 percent in the graphs. In spite of the shortcomings listed above some interesting information emerges.

We can assume that ponds where broods were seen most nearly represent breeding territory although it is known broods do move around some.

Pond size - Small ponds of less than 1 acre were most important in the Fairbanks area and were used by 30% of the broods whereas small ponds were not used in the ~~F~~ulkana Basin at all and used by less than 10% of birds on the Kenai. Medium size ponds of 1 to 5 acres were most used in the Fairbanks area and in all other areas ponds in excess of 5 acres were most popular.

Water quality - Water was considered clear in 40% of the total observations,

however, in the Gulkana and Fairbanks sections a substantial number of the waters were felt to be stained probably by decomposed vegetative matter. Turbid waters, usually glacial melt, were important in the Copper Canyon and Cook Inlet. The summer had been extremely hot and probably during the nesting season or during a cool summer turbid waters would be much less prevalent. There was an unanimous agreement that plankton bloom was absent from waters used by trumpeters.

Water source - In all areas except Fairbanks observers agreed that running water was the norm. In the Fairbanks area it was felt 90% of the waters were stagnant or without inlet and outlet. Possibly there is good water exchange through the substrate in the ponds without obvious drainage systems.

Water depth - Waters were considered shallow in 80% of the total observations but in the Fairbanks and Kenai areas deeper waters were well used.

Wetland type - It is more difficult to make snap decisions in this category. The difference between a pothole and a muskeg pond may not be clear, also beaver dams might or might not be easily seen. The item "outwash" was not used by the observers in the Kenai or Fairbanks area. This refers to the gravel bar ponds below a glacier.

We do find that beaver were involved with at least 10% of all observations and that their ponds were used by 60% of broods in the Copper Canyon.

Oxbow lakes were not used except in the Fairbanks area where they were used by 30% of the broods and 20% of all swan sighted.

Edge vegetation - Sedges were present around more than 70% of the shorelines where swan were seen. This could indicate sedge is present around most

water areas in Alaska from the rain forest to the Interior muskeg. Birch was not a common edge species anywhere. Willow-alder was most obvious in the Copper Canyon and Gulkana Basin. Spruce was most evident in the Fairbanks area and on the Kenai.

Emergent vegetation - This factor is considerably more important probably than edge vegetation for the floating trumpeter nest must be built with vegetation from the water. Forty percent of the waters in all areas had Equisetum and 40% had Nymphor. Polygonum was not recorded and 10% of waters appeared to have no emergent vegetation.

Presence of other waterfowl - Other waterfowl were not observed in 70% of the sightings. Only on the Kenai were other waterfowl found to any great degree and here 50% of the water had other waterfowl present. This indicates that trumpeters are not found on the type of lakes where ducks congregate in numbers. That the odd duck could have been present in many cases and not seen is probable. I assume that the use of a Super Cub on the Kenai may have helped in finding other waterfowl. This leaves open the question of whether trumpeters actually drive other waterfowl away or that they like lakes of a character not sought by ducks. The indications are that swans prefer cleaner lakes not covered with a bloom or saturated with plankton such as those often preferred by ducks. The presence of Nymphor and Equisetum and running water also indicate cleaner water and perhaps lower water temperatures than in the typical duck congregating pond. It would seem that ducks do not seek feeding trumpeters on the breeding range to pick up food stirred up from the bottom as has been recorded in other areas.

Miscellaneous Observations

1. In the Gulkana Basin we saw a flock of five swans, one of which was very much smaller than the others. The possibility exists that this could be a whistling swan. There are a few records of whistling swans spending the summer in Interior Alaska but these are quite unusual and may represent injured or weak birds forced to drop out of migration.

2. In three instances only more than one brood was seen on a single lake. Near Yakataga four broods were seen on a beach scar type lake, Martin Lake east of Cordova had three broods and Peninsula Lake in the Copper Canyon had four broods. Four incubating swans were observed on the Yakataga Lake in May and it is suspected that the broods on the other two lakes were also hatched there. Each of these lakes are about four miles long in the longest dimension and are heavily vegetated. It is suspected that the nests were far enough apart that the swans could not see their neighbors. There may be a few other lakes that would be suitable for multiple nesting but these lakes are not common.

3. Most of the trumpeter swan sightings were far removed from human activity. Near Cordova at least one pair nested successfully within sight of a well traveled road. There is a place near Mentasta Lake in the Gulkana area and another near Palmer above Cook Inlet that have excellent looking swan habitat that is not occupied. Mentasta Lake is utilized extensively by muskrat hunters in the spring and the Palmer area is accessible to the weekenders from Anchorage. It was felt that swans could have been shot out of these two small areas. The great bulk of the swan breeding habitat would appear fairly safe from the casual depredations

of man.

4. Prior to 1964 Martin Lake on the Gulf Coast was a regular congregating place for non-breeding flocks of swan in that area. Bering Lake nearby is larger but was turbid with glacial melt water. The 1964 earthquake re-routed the flow of glacial water near Bering Lake and this lake is now clear. The Martin Lake flock seems to have moved to Bering Lake where 49 birds were seen.

5. Predation may be occurring during the breeding season. The ten single adult broods and two broods without adults would indicate that predation on adults is not extensive. The May-August counts (Table 4) indicate a reduction of about 1.5 young per family from the incubation period to the point near fledging. Part of this reduction probably resulted from eggs that failed to hatch.

6. Thirty seven percent of the swan sightings in Alaska were on National Forest lands and 6% on the Kenai National Moose Range. Thus some 43% of the Alaskan trumpeters are on intensively managed Federal lands where their welfare is a primary concern. Probably more than 99% of the rest of the trumpeters are on public lands either State or Federally owned.

7. Breeding records of trumpeters off the survey areas are not numerous but several new ones are of note.

Observations of trumpeter swan families are not unusual in southeast Alaska. Most of these, including one reported by Banko, are suspect because trumpeters move into southeastern during September and winter there. There are,

however, a number of glacial outwash plains that appear to have suitable swan nesting habitat. On September 11, 1967 Fred Robards and I saw a pair with two young in the Chilkat Valley near Haines that is undoubtedly a positive breeding record. Other southeastern records can be expected.

On August 27, 1968 a pair of trumpeters with five young was observed on the head of Stony River near Merrill Pass. A typical doughnut shaped nest was in the same lake. Whistling swans were identified on the lower Stony.

In the summers of 1959 to 1965 two pair of swans were always seen on the same two lakes near Dall River on the Yukon Flats. On August 10, 1960 one of these pairs was accompanied by a single young. A ground check disclosed these to be trumpeters. No other broods of swan have been seen in recent years on the Yukon Flats and in 1967 and 1968 no swans at all were seen although the Dall River area was searched.

Over a thirteen year period swan sightings in the Koyukuk Valley, while conducting breeding pair duck surveys in May, have averaged 3.46 per year. This gives an expanded population average of 315 adults in the spring if we use the same expansion factor used for ducks. Three nests have been observed over the years and on this basis these are identified as trumpeters. Because of the nature of these counts it is assumed 315 is a high figure and that the population must be somewhat smaller.

One brood of trumpeters was captured on the Yukon Delta in 1968, as previously mentioned.

On April 1, 1964 a family group of swans was observed near Ilnik on the

Alaska Peninsula. We have every reason to believe that these were trumpeter swans (see next section). They were reliably reported to have wintered in the area. There is a possibility that trumpeters nest here. Trumpeters have wintered adjacent to the breeding areas on the Kenai.

8. It appears likely that the gray juvenile plumage of trumpeter swans remains in tact longer than it does on whistlers.

Loyal Johnson had no trouble in separating gray juveniles from white adult trumpeters in May near Cordova. He stated that the difference was so obvious close scrutiny or particular care was not necessary and that the flocked swans were either gray or white. In many years of scrutiny from the air on the Yukon Delta no obvious gray or juvenile whistling swans have ever been seen. By August all trumpeters appeared white.

In April 1964, after seeing what was obviously a swan brood at Ilnik, a number of whistling swan near Cold Bay and on Unimak Island were scrutinized and no gray young were noted.

A captive juvenile whistling swan kept over winter in Juneau this year was entirely white by mid April except for a grayish neck and a dark gray head speckled with new white feathers. This bird would be very difficult to distinguish as a juvenile from the air. If it had acquired the normal head staining and was with adults with stained heads, it would be impossible to distinguish.

This points up the probability that the entire growth pattern of trumpeters may be quite different than whistlers. Starting from what is essentially

the same size egg trumpeters must attain nearly twice the size of whistlers prior to their first migration. It could well be that full weight is not attained until the second year or even later. The fact that trumpeters are not nearly fully developed by the time they fledge could account for the less ambitious migratory habits of trumpeters and for the obvious high mortality during the first winter.

This is an item that warrants further exploration for it may offer a means of distinguishing whistlers from trumpeters by air observation during the late winter.

Epilogue

The Alaska trumpeter swan count of 1968 was a very successful cooperative project. Previously a good deal less was known about the distribution of swans in the Cook Inlet and Fairbanks areas and it was felt by the observers that some portions of these sections might not have been completely covered. There is no question that some swans were missed in all sections and that some swans nest outside the survey area. For these reasons it seems probable that the trumpeter swan population of Alaska was at least 3500 birds in the fall of 1968 and maybe as many as four to five thousand.

It was the feeling of most of the observers that even though the birds were widely scattered and many water areas were unoccupied, that the habitat was fairly well saturated. This was derived from the fact that after some experience it was possible to look far ahead of where any swans could be seen and anticipate the lakes that would have broods. Frequently a brood or pair would be there. This was particularly true in the Gulkana

Basin. The high rate of production on the other hand does not indicate a saturated population in any area unless high mortality some place is using up the annual increment. At some future time another survey will have to be done and compared with the maps and observations of this survey to determine whether or not we have an expanding population.

With 3500 or more trumpeters occupying the breeding range in Alaska it seems remarkable that we do not know where they spend the winter. Reports of trumpeters wintering in southeastern Alaska, British Columbia and Puget Sound in recent years add up to something less than a thousand birds. It seems unlikely that any great numbers of swans wintering along this coast could go undetected. This brings up the possibility that Alaskan trumpeters could be mixing with whistling swans farther south, maybe along the Columbia River. Before a true understanding of the dynamics of the trumpeter population can be achieved it will be necessary to pin down where and under what conditions they spend the winter.

Finally it could be said that the trumpeter swan breeding habitat in Alaska appears to be fairly secure at present. What limiting factors the winter habitat imposes on the population we do not know, yet trumpeter numbers appear to be stable at least and possibly increasing. But it is no longer practical to feel secure about the future of far northern habitat. Mans capacity for massive developments has increased dramatically within the past generation. Hugh resource exploitation plans are afoot. Oil production is a reality on the Kenai and in Cook Inlet. Exploratory oil wells and seismic investigations have started in most other parts of the trumpeter range. On the Gulf Coast natural oil seeps have long attracted speculative

attention. Open pit coal mining may be imminent on the Gulf Coast at Katella. Roads and pipelines will criss cross many areas in the future. Mines, oil fields, timber camps, settlements and armed men will proliferate in Alaska. Attention to the welfare of the Alaskan trumpeter will unquestionably be required.

Table 1

Trumpeter Swan Count - 1968

(All totals = total birds)

	<u>Gulf Coast</u>		<u>Copper Can.</u>		<u>Gulkana</u>		<u>Fairbanks</u>		<u>Cook Inlet</u>		<u>Kenai</u>		<u>Total</u>	
	Tot.	%	Tot.	%	Tot.	%	Tot.	%	Tot.	%	Tot.	%	Tot.	%
Singles	29	3	3	2	31	5	23	5	16	4	3	2	105	4
Pairs w/o Broods	258	25	34	22	184	31	146	31	164	40	44	24	830	29
Pairs w/Broods	182	18	24	15	104	18	79	17	65 ⁶⁹	16	42	23	496 ⁵⁰⁹	17
Young in Broods	362	35	44	28	190	32	138	29	124	30	65	36	923	33
Flocks	191	19	53	34	81	14	92	19	46	11	27	15	490	17
Totals	1,022	100	158	101	590	100	478	101	415 ⁴¹⁹	101	181	100	2,844 ^{2,848}	100

Note: Two broods had no parents. Ten broods had but a single parent.

Table 2 Trumpeter Swan Brood Sizes - 1968

Number Young	1	2	3	4	5	6	7	Total No. Broods	Average Brood Size
Gulf Coast	8	16	12	22	15	17	3	93	3.89
Copper Canyon	1	3	3	2	4			13	3.38
Gulkana Basin	4	9	8	15	12	4		52	3.65
Fairbanks	7	5	12	7	9	2		42	3.29
Cook Inlet	4	5	6	14	6	1		36	3.44
Kenai	3	5	4	5	4			21	3.10
Total	27	43	45	65	50	24	3	257	3.59
%	11	17	18	25	20	9	1	101	

Trumpeter Swan Flock Size - 1968

Table 3

<i>Nc.</i>	<u>Gulf Coast</u>	<u>Copper Can.</u>	<u>Gulkana Basin</u>	<u>Fairbanks</u>	<u>Cook Inlet</u>	<u>Kenai</u>	<u>Total</u>
3	4	1	14	1	4	1	24
4	3		7	4	3	6	24
5	2		1	2	1		6
6	1		1		3		5
7	1						3
8				2			2
9	2						2
10	1			1			1
11							
12							1
13							1
14				1			
15	1						
16							1
17							1
18							2
19							
20	1						
25	1						
26	1	1					7
49	1						
Ave. Flock Size	10	27	4	7	4	4	7

Table 4

Trumpeter Swan Counts - Cordova
(Comparison May & August)

	<u>May 1968</u>	<u>August 1968</u>
Singles	28	23
Paired birds	246	308
Flocked birds	247	169
Young of year (1967)	60	243
Total adults	<u>519</u>	<u>500</u>
Grand total	519	743
Ave. clutch	<i>23 clutches</i> 5.13	Average brood (63 broods)
	5.16	3.86
% young from '67	11.6	% young from '68
		32.7

May count by Loyal Johnson - Alaska Department of Fish and Game
August count by King & Bartonek - BSF&W

Table 5

Comparative Weather Data Trumpeter Swan Breeding Areas
(Long term averages from U. S. Weather Bureau)

	April	May	June	July	Aug.	Sept.	Oct.	Average Summer May to Aug.	Average Annual
<u>Average Precipitation</u>									
Gulf Coast									
Cordova	5.07	6.44	4.19	6.44	9.72	15.47	15.56	26.79	98.64
Yakutat	7.98	7.92	4.96	8.63	10.54	16.32	19.93	32.05	139.15
Gulkana	.26	.66	1.38	2.15	2.45	2.06	1.37	6.64	14.70
Fairbanks	.29	.74	1.37	1.92	2.26	1.21	.92	6.29	11.92
Cook Inlet									
Talkeetna	.82	1.38	1.89	3.04	5.54	4.42	3.01	11.85	28.85
Anchorage	.40	.51	.89	1.55	2.56	2.71	1.87	6.29	14.27
<u>Average Temperature</u>									
Gulf Coast									
Cordova	36.4	42.9	49.3	53.3	53.4	48.0	40.8	48.5	38.6
Yakutat	36.5	43.3	49.5	52.7	52.8	48.4	41.7	49.6	39.3
Gulkana	29.6	42.2	51.8	55.2	51.7	43.3	29.9	50.2	28.3
Fairbanks	28.9	47.4	59.3	60.9	55.6	44.6	27.5	55.8	26.2
Cook Inlet									
Talkeetna	33.7	44.4	54.8	58.0	54.5	46.2	33.6	52.9	35.3
Anchorage	35.4	45.7	53.7	57.3	55.6	48.0	36.0	53.1	33.2
<u>Freeze Data</u>									
	<u>Temp.</u>	<u>Mean date last Spring occurrence</u>		<u>Mean date first Fall occurrence</u>		<u>Mean No. days between dates</u>			
Anchorage	32°	5-18		9-13		118			
	24°	4-19		10-6		170			
Cordova	32°	5-10		10-2		145			
	24°	4-8		11-8		214			
Fairbanks	32°	5-24		8-29		97			
	24°	4-30		9-20		145			

Table 6 Altitude of Trumpeter Swan Sightings - 1968
 (Altitudes in feet)

	<u>Highest</u>	<u>Lowest</u>	<u>Normal</u>
Gulf Coast	300	10	Under 100
Copper Canyon	400	200	Under 300
Gulkana Basin	2,709	1,600	2000-2500
Fairbanks	700	300	300-400
Cook Inlet	1,122	40	Under 300
Kenai	1,255	40	Under 300

Table 7

Trumpeter Swan Breeding Range

	<u>Square Miles</u>	<u>Sq. Mi. per Swan - 1968</u>
Gulf Coast	2,080	2.0
Copper Canyon	188	1.2
Gulkana Basin	5,500	9.3
Fairbanks	6,440	13.3
Cook Inlet	5,625	13.5
Kenai	2,375	13.1
Fort Yukon Flats	5,800	? (not surveyed)
Koyukuk	5,850	? " "
McGrath	3,410	? " "
Stony River	1,000	? " "
S.W. Alaska	<u>1,000</u>	? " "
Total	39,268	

- Note:
1. It is not possible to outline range with complete accuracy thus above totals are somewhat arbitrary especially in the Fairbanks area and the unsurveyed areas.
 2. Average square miles per swan on the surveyed range equals 7.8.
 3. Average figures projected to total range gives a population estimate of 5,034.

Table 8 Observers & Dates, Trumpeter Swan Counts - 1968

<u>Location</u>	<u>Dates</u>	<u>Observers</u>	<u>Affiliation</u>
Cordova	May 14-17	Loyal Johnson	ADF&G
Gulf Coast	Aug. 13-16	Jim King - Pilot Jim Bartonek Sigurd Olson	BSF&W " USFS
Copper Canyon	Aug. 17	Jim King - Pilot Jim Bartonek	BSF&W "
Gulkana Basin	Aug. 17-25	Jim King - Pilot Jim Bartonek	" "
Fairbanks	Aug. 23-Sept. 12	Averill Thayer - Pilot Ron Modafferi Jean Earnest Bob Weeden Bea Faber Scott Grundy	" U. of A. ADF&G " " "
Cook Inlet	Aug. 14-23	Ray Tremblay - Pilot Will Troyer Jim Bartonek Jim Seidl Jim King - Pilot Jim Bartonek	BSF&W " " BCF BSF&W "
Kenai	Sept. 11-13	Bob Richey - Pilot Dr. Harold Steinhoff John Kurtz James Segura	"

Table 9 Flight Time Trumpeter Swan Survey - 1968

	<u>Flight Time</u>	<u>Swan Per Hour</u>	<u>Sq. Mi. Surveyed Per Flying Hour</u>
Gulf Coast	25.8	40	81
Copper Canyon	2.5	63	75
Gulkana Basin	29.1	20	189
Fairbanks	32.7	15	197
Cook Inlet	22.3	19	252
Kenai	<u>11.3</u>	<u>16</u>	<u>210</u>
Total	123.7	23	180

Note: Flight times include point to point travel to and from survey areas.

Figure 1 Gulf Coast
% of occurrence to nearest 10%

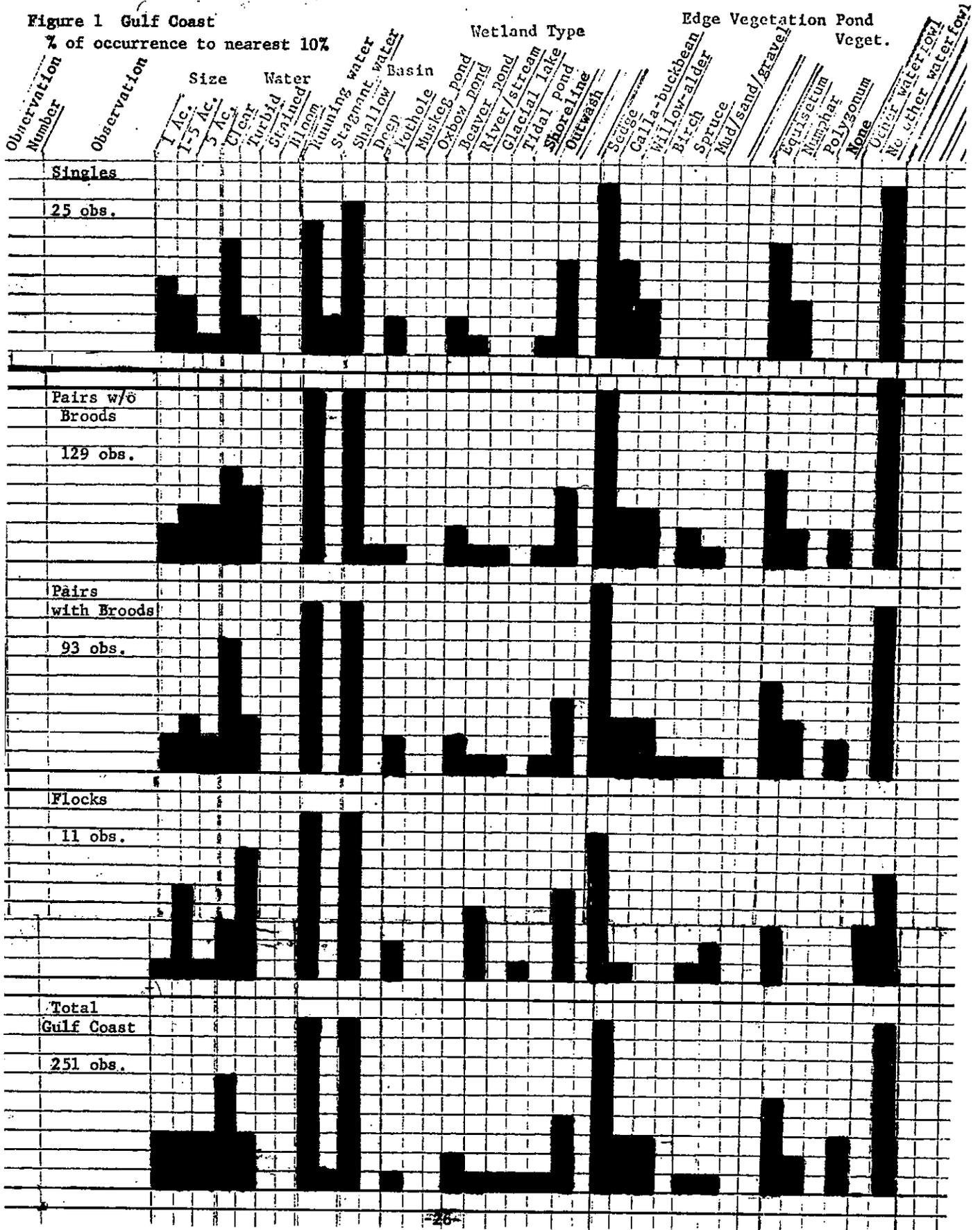


Figure 3 Gulkana Basin
% of occurrence to nearest 10%

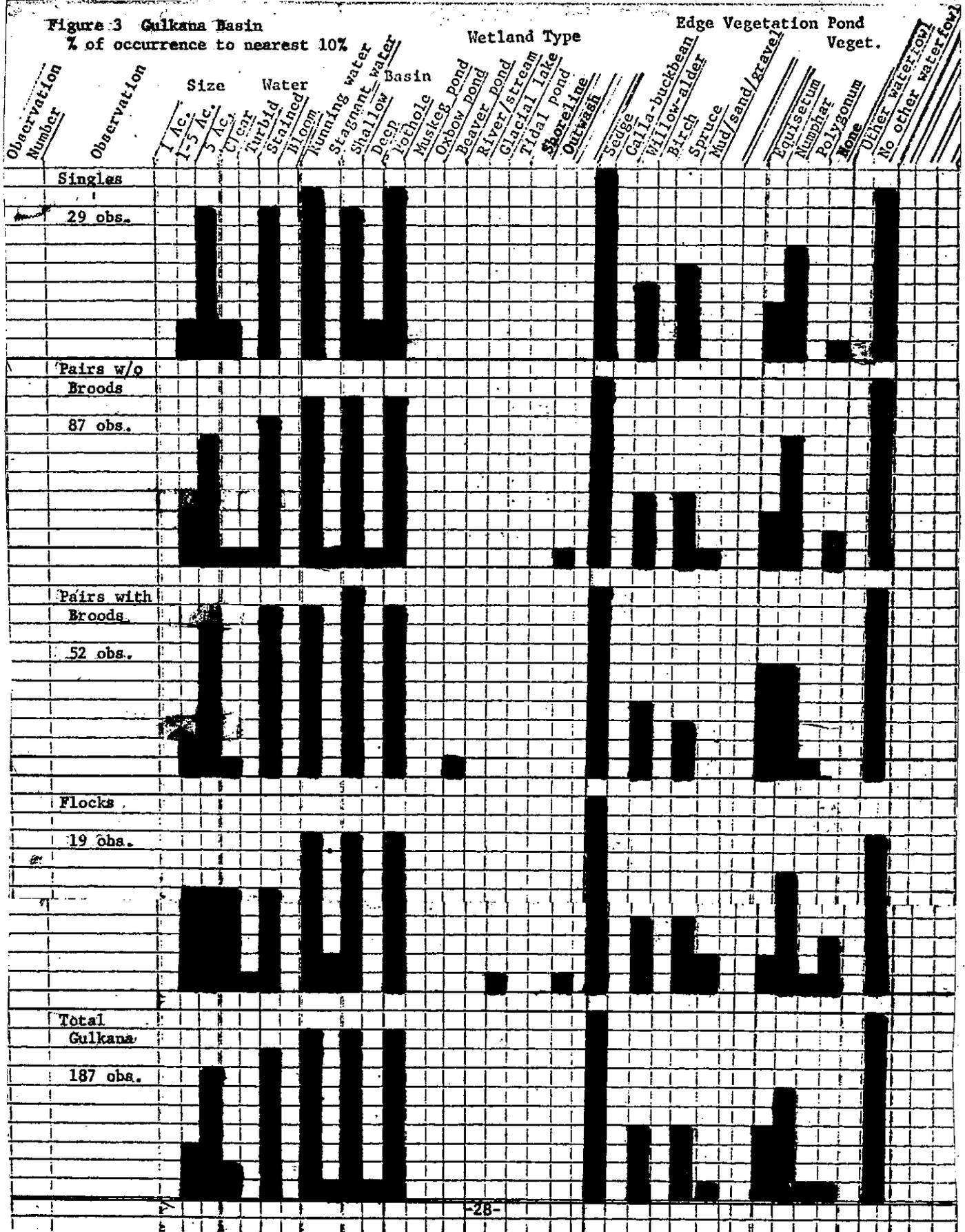


Figure 4 Fairbanks
% of occurrence to nearest 10%

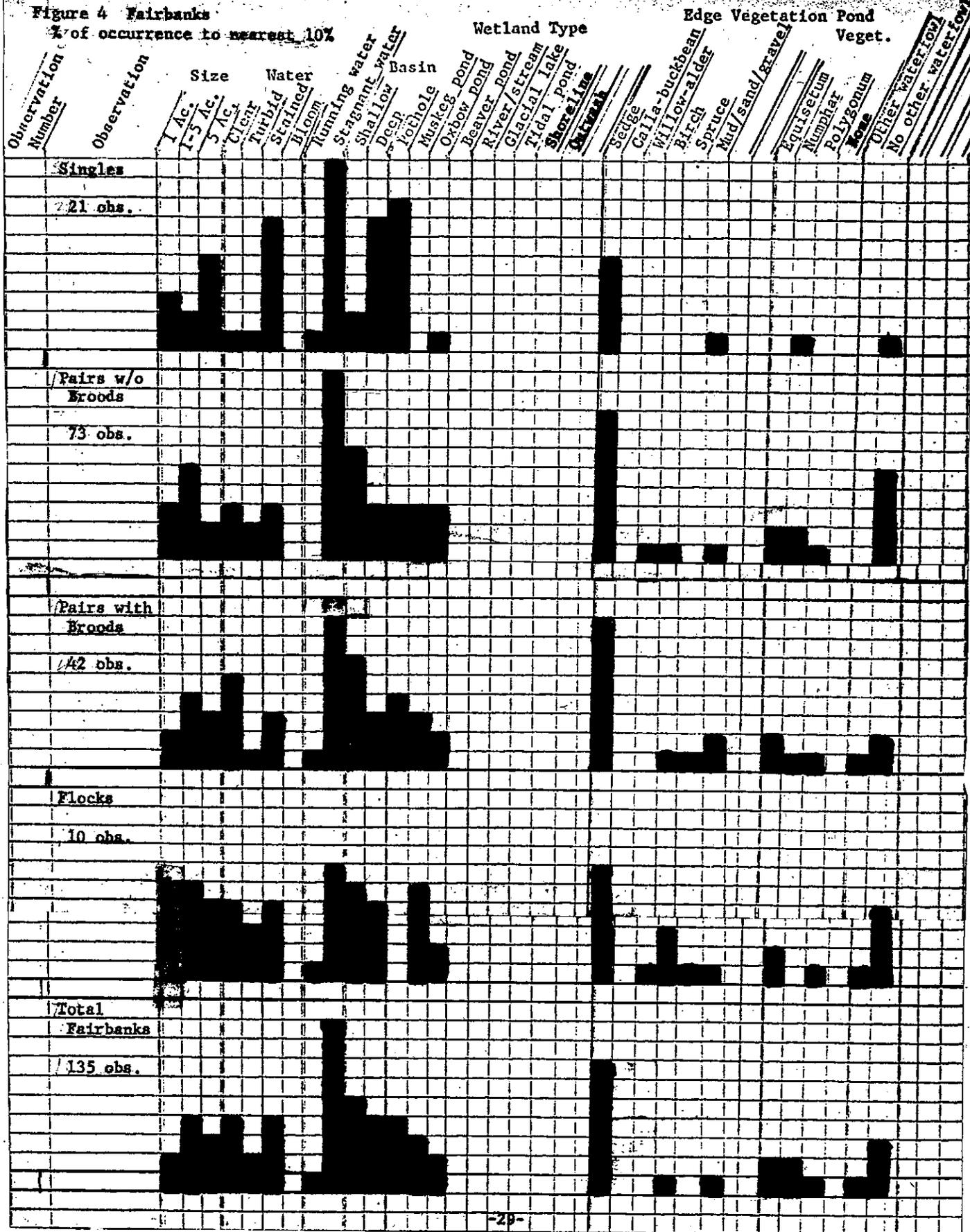


Figure 5 Cook Inlet
 % of occurrence to nearest 10%

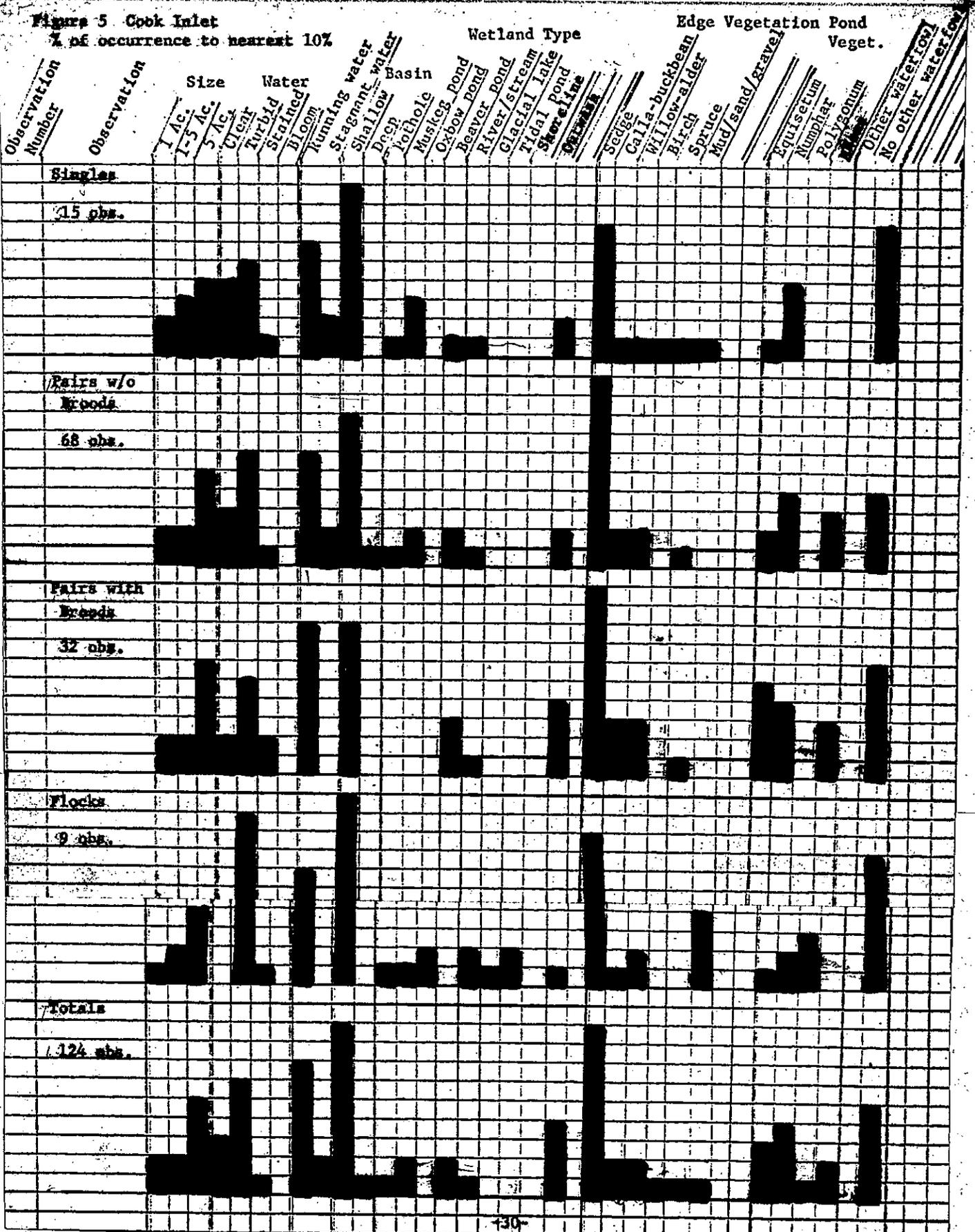


Figure 6 - Canal
% of occurrences to nearest 10%

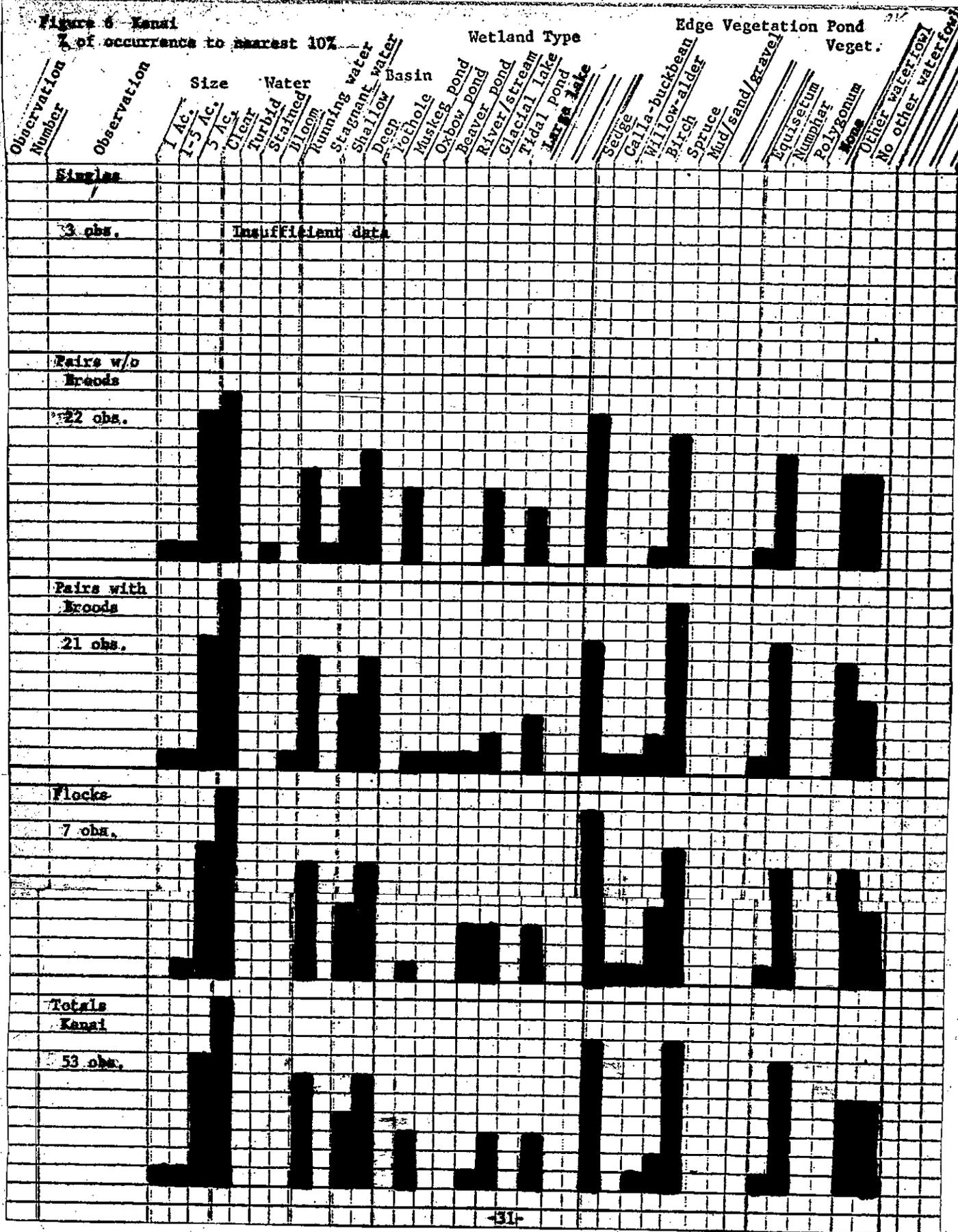
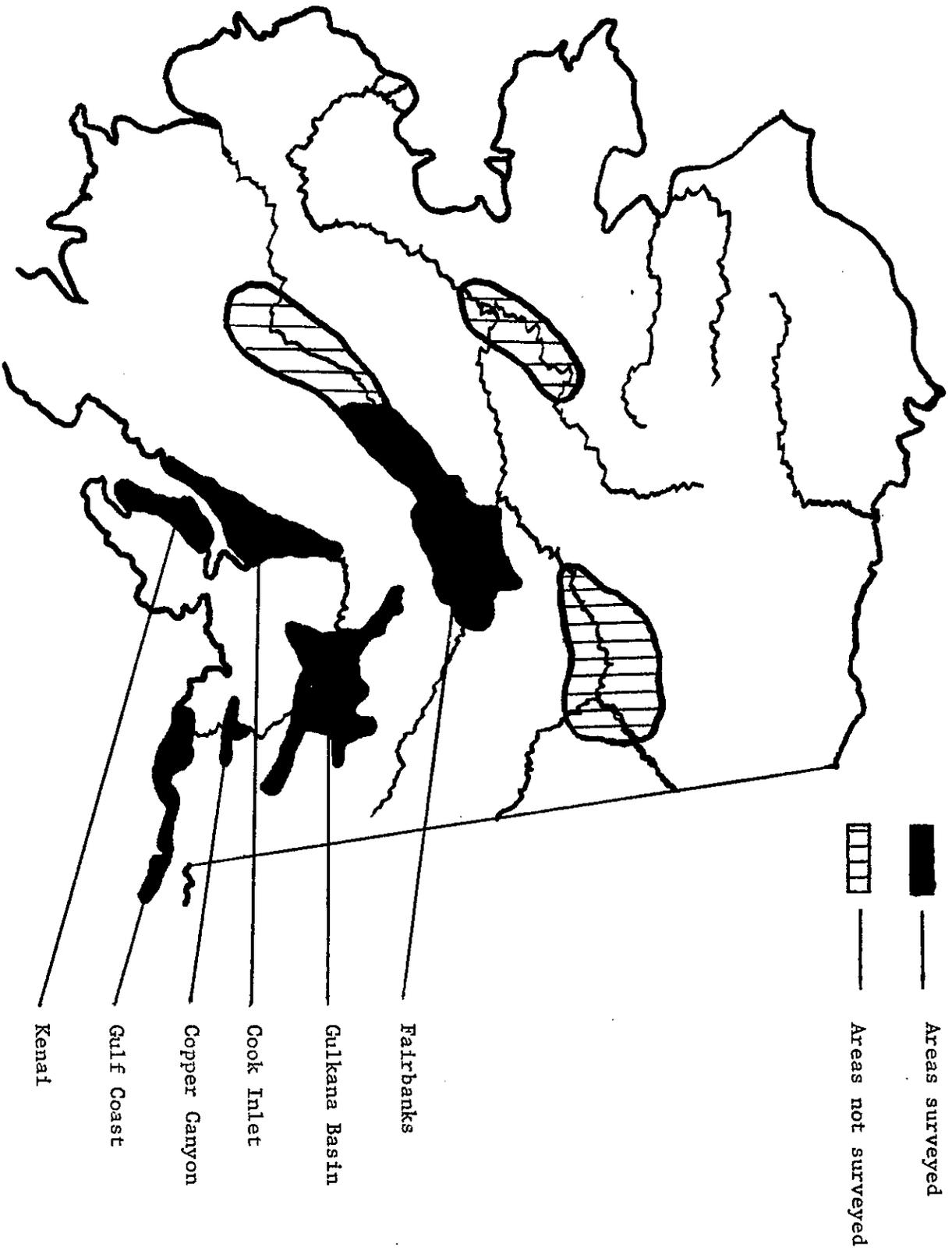


Figure 8 Trumpeter Swan Breeding Range 1968



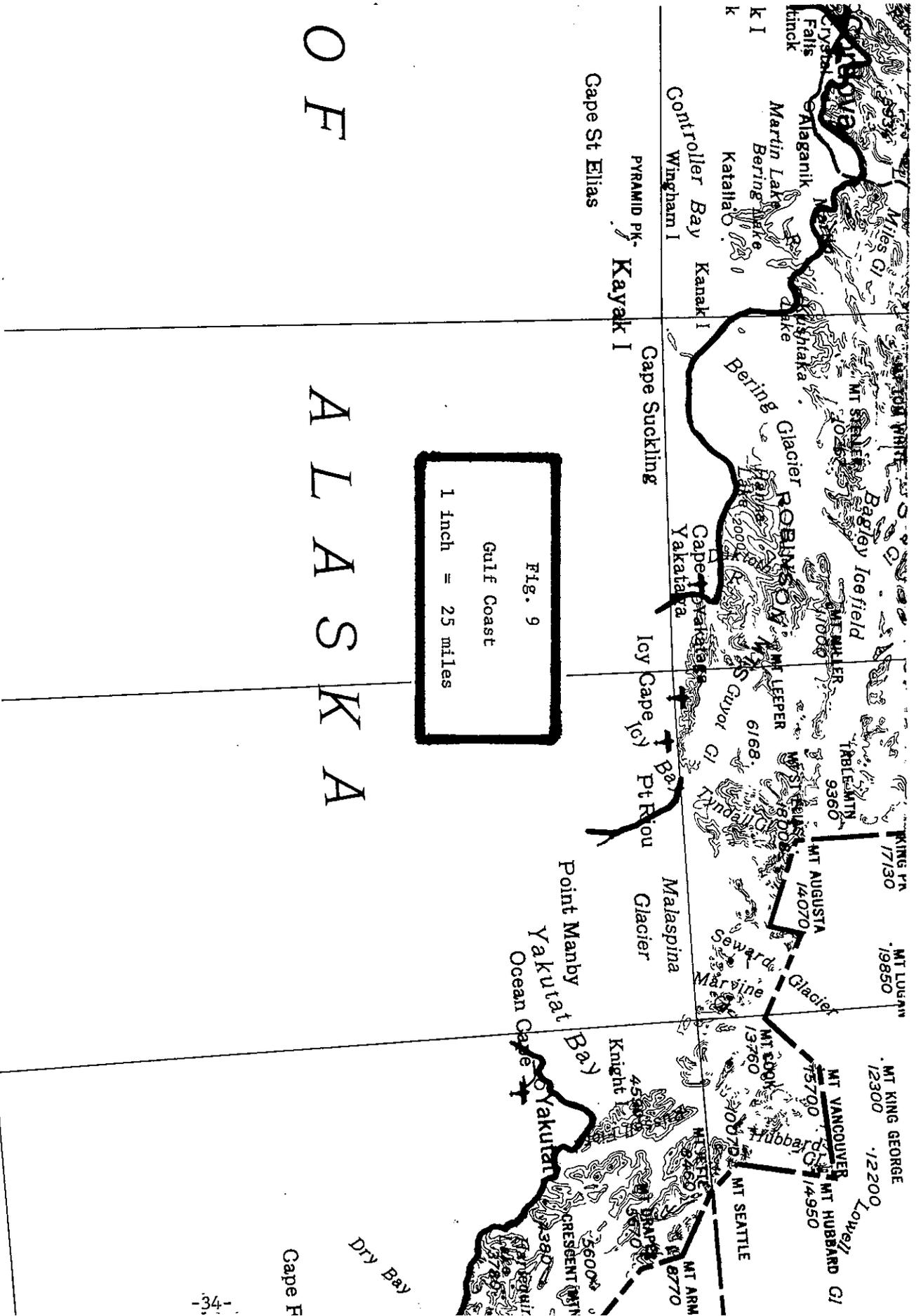


Fig. 9
Gulf Coast
1 inch = 25 miles

O F A L A S K A

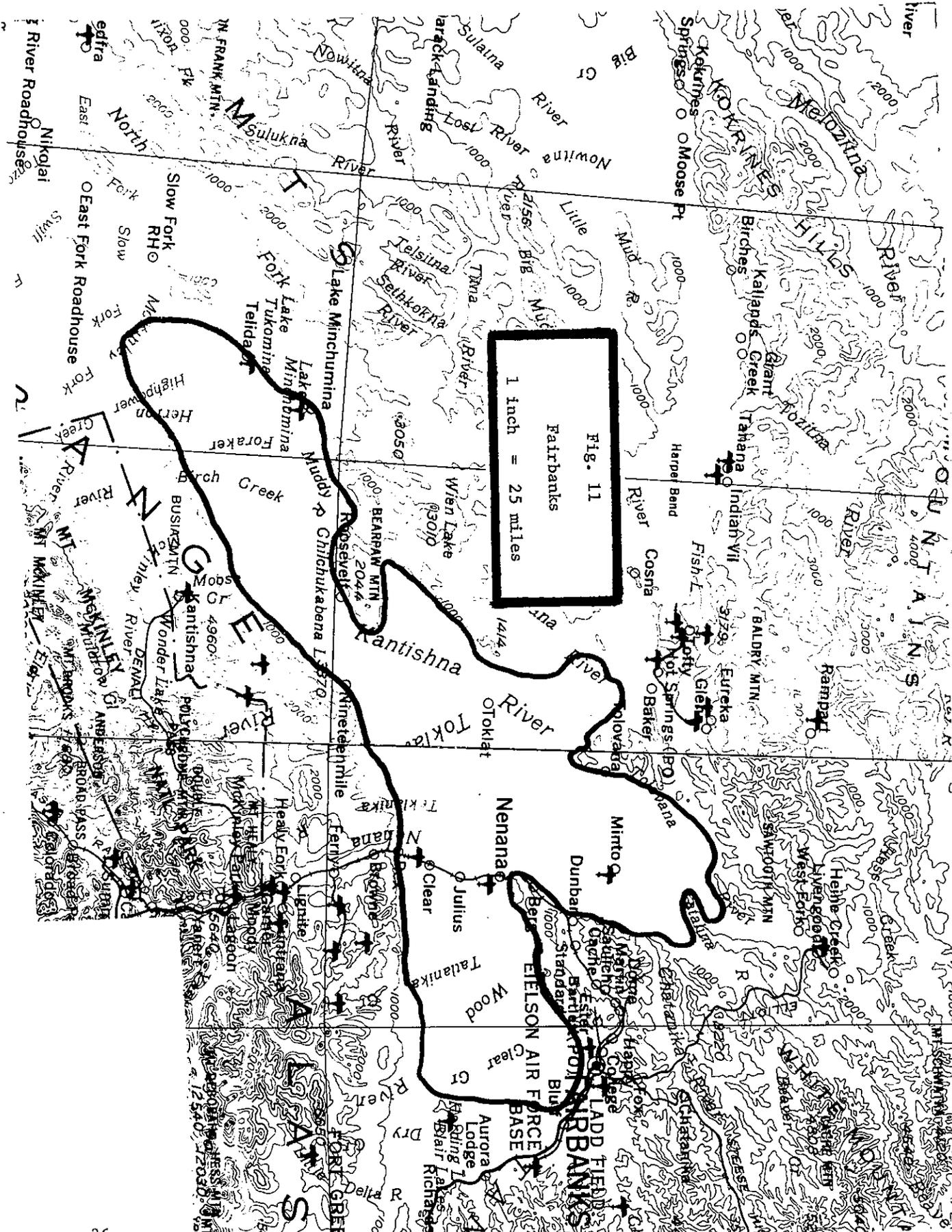


Fig. 11
Fairbanks
1 inch = 25 miles

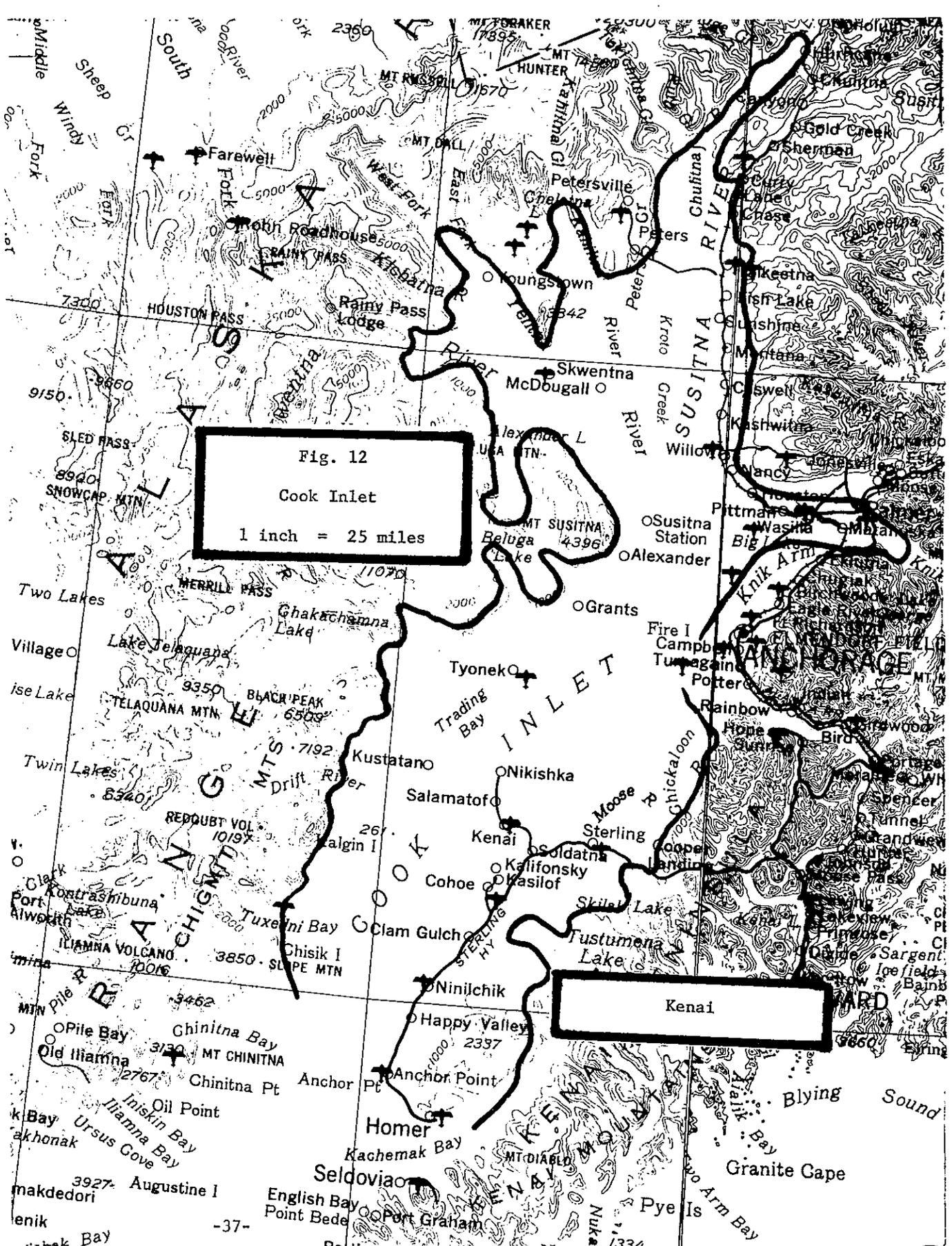


Fig. 12
Cook Inlet
1 inch = 25 miles

Kenai

Appendix A

Trumpeter Swan Survey

The trumpeter swan is a scarce if not endangered species. We know about where they are located in Alaska during the summer and they are easy to see from the air so no fancy techniques are needed to get a fairly complete head count. If such a head count were made in such a fashion that it could be duplicated by anyone in the future 10, 50 or 100 years hence it would be of tremendous value in the management of these birds. The following project is therefore proposed for the summer of 1968.

Trumpeter Swan Survey Methods - 1968

Time

The month of August. Late August or early September is the best time to do a swan census because the broods are still on the ponds where they were hatched but by this time are large enough to be easily seen and counted. For the convenience of the observers it will be most practical to do the survey during the month of August.

Area Assignments

Fairbanks Agents - Tanana Valley from about Blair Lakes to Tanana, Minto Flats, the Kantishna Valley to Lake Minchumina area.

Anchorage Agents - The Susitna Valley south and west of Talkeetna and the west side of Cook Inlet to Kamishak Bay.

Moose Range Personnel - The Kenai Peninsula.

Waterfowl Supervisor & Juneau Agents - Yakutat to Cordova. The Copper Valley. The Nelchina area.

Unassigned at present - The Yukon Flats. The Koyukuk Valley.

Two people should make all flights - the pilot and a recording observer.

Maps

In most cases 4-mile to the inch quadrangle maps will be adequate to locate swan observations precisely. In a few areas where ponds are very small it may be advisable to use 1-mile to the inch maps. This will have to be at the discretion of the observers in each area. Because they are so much easier to handle 4-mile to the inch maps should be used if possible. One-mile to the inch maps, if used, should be attached to a 4-mile to the inch map showing flight paths and general locations.

Flying

Past experience has shown that swan can best be located from about four to five hundred feet of elevation. It is sometimes necessary to get lower to make a good brood count. From 500 feet it is possible to see most swan within about one-half mile of either side of the plane. Likely ponds can be located fairly easy from this height. Every effort should be made to look at all eligible lakes and locate all swan. In some areas it will be necessary to fly a grid like pattern, for instance over the wetlands due south of Fairbanks. In other areas it will be possible to locate eligible lakes on the map and fly more or less directly to them.

Recording Data

The flight path will be marked with pencil on the 4-mile to the inch map as precisely as possible. All swan observations will be located as precisely as possible with a dot on the map and a number. Each observation will be recorded on a sheet of paper and referenced to a numbered dot on the map. Numbers

can begin with 1 on each map but must be properly referenced on the record sheet. Dates, of course, should be recorded on the record sheet.

Swan observation will be recorded in five categories as follows:

- A - Pair with brood (include number of young)
- B - Single with brood (include number of young)
- C - Pair without brood
- D - Single without brood
- E - Flocked birds (any group of 3 or more adults)

Final Reporting

The maps will be an integral part of the long term record so flight paths and location numbers and dots should be copied on fresh maps when the field work is completed.

The recorded observations referenced to the map should be typed.

A short narrative report should include hours of flight time, total swan in each of the five categories, personnel participating, any interesting observations, description of any problems and suggestions for the improvement of this type survey in the future.

Final report should be sent to Juneau when completed and in any event before December 31, 1968.

Note

Keep in mind that many years from now someone will undoubtedly wish to follow your exact flight pattern and visit the same lakes where your observations were made and that this person may not be able to discuss the matter with any of us. So document your actions clearly.

Sample Record Sheet
Trumpeter Swan Census - 1968

Pilot _____

Observer _____

<u>Date</u>	<u>Map Name</u>	<u>Observation No.</u>	<u>Observation</u>
8/10/68	Fairbanks	1	Pr. & 2 yng.
		2	S.
		3	S. & 5 yng.
	Kantishna Riv.	1	Pr.
		2	Flk. of 3
		3	Flk. of 25
		3	Pr. of 3 yng.

Sample Table
1968 Trumpeter Swan Data

	Total	Number of Young								
		1	2	3	4	5	6	7	8	9
Pr. W. Brood	20	1	3	2	6	1	4	1	1	1
S. W. Brood	6		1	2	1		2			
Pr. W/o Brood	23									
S. W/o Brood	11									

	Total Birds	Flock Sizes						
Flocks	73	10	3	7	14	36	3	
Total Broods	26							
Total Young	100							
Average Brd. Size	3.84							
% Pairs W. Yng.	43%							
Total Adults	176							
Total Swan	276							
% Young in total Population	36%							

