



DISTRIBUTION AND ABUNDANCE OF BREEDING SEABIRDS

IN CHINIAC AND SOUTHERN MARMOT BAYS,

KODIAK ISLAND, ALASKA, 1975

Matthew Dick

Irving M. Warner

and

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U.S. Fish and Wildlife Service  
Office of Biological Services-Coastal Ecosystems  
Anchorage, Alaska

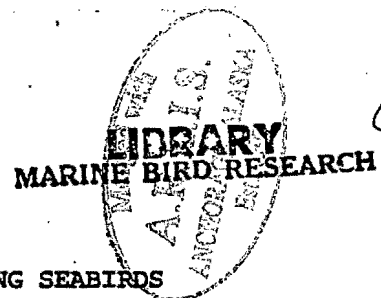
Field Report No. 75-007.2

May 1976

On Reserve

This report provides a preliminary review of progress in field or laboratory activities and is prepared for administrative use within the Fish and Wildlife Service. The interpretations and conclusions presented herein are frequently based on fragmentary data and partial analysis, and are subject to change. For these reasons, information contained in this report should be used or quoted with caution.

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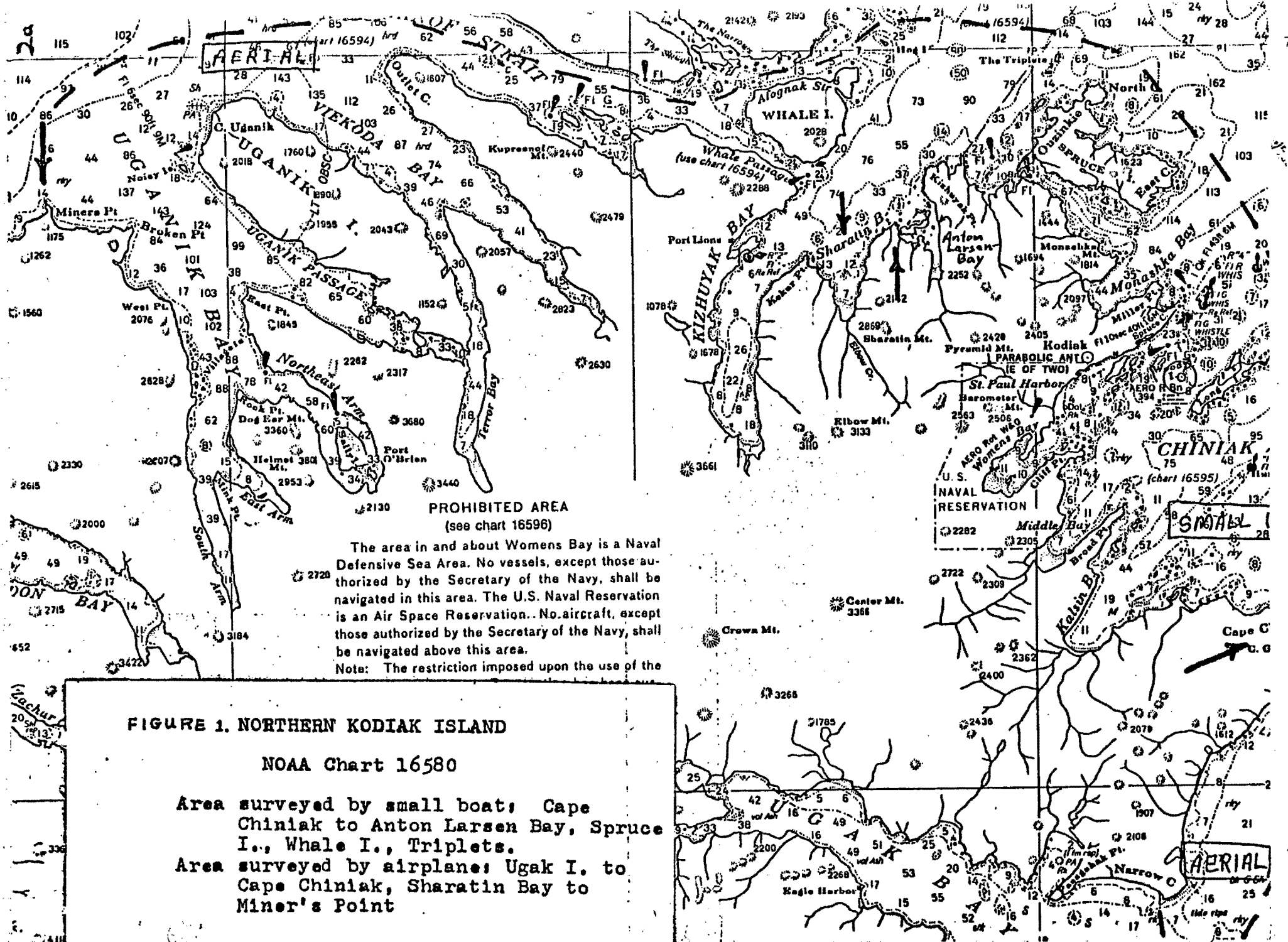
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### Abstract

A census survey of breeding seabirds was conducted by boat and airplane in Chiniak and southern Marmot Bays, Kodiak Island (57°2'N; 152°06'W), Alaska, from 15 June to 14 August 1975. A total of 59 colonies were catalogued. The overall breeding population of seabirds in the area surveyed by boat was determined to be 56,553 pairs. Seventy-nine percent of the colonies and 80.7% of the breeding pairs were located on islands smaller than 1.0 mi. in length. Ninety-seven point three percent of the breeding pairs were located on islands smaller than 6.0 miles in length, while only 2.3% nested on mainland Kodiak. Most of the small islands were similar in community structure. Fourteen breeding species were identified in the bays. An additional two species likely breed on large, wooded islands and the mainland. The most abundant breeder was the Tufted Puffin, occupying 59.6% of the overall population in both bays. Second most abundant was the Black-legged Kittiwake, occupying 32.1%. The Tufted Puffin was the most ubiquitously distributed species, the Glaucous-winged Gull second most ubiquitous.

The Office of Biological Services - Coastal Ecosystems, USFWS, Anchorage, is presently engaged in, among other things, compiling a catalogue of seabird colonies in Alaska. In summer, 1975, a colony census study was initiated on Kodiak Island. The mainland shoreline and offshore islands from Cape Chiniak northward and westward to Whale Island

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were surveyed by small boat between 15 June and 10 August. Northern Kodiak Island from Sheratin Bay westward to Miner's Point was surveyed by airplane on 14 August (see Figure 1). The study yielded fairly detailed information for an entire bay system (Chiniak Bay), somewhat less detailed information for part of another bay system (the southern shoreline and islands of Marmot Bay) and roughly qualitative information from Sheratin Bay to Miner's Point.

#### Methods

From 15 June to 6 July, Dick and MacIntosh surveyed from a 16' Boston Whaler powered by a 50 Hp. outboard motor; from 16 July to 10 August Dick and Warner utilized a 19' Bartender skiff powered by a 40 Hp. outboard. Both vessels had low draft and a high degree of maneuverability; hence, weather permitting, they could be taken close enough to nearly any stretch of shoreline to permit the observers to census with naked eye or binoculars. Some colonies, such as Zaimka and Mary Islands, could be reached by rowing in a Grumman aluminum canoe. A few colonies could be walked to. Airplanes were used on two occasions. On 25 July, Vernon Berns of the Kodiak Island NWR piloted Dick in a Supercub to the Triplets and to Whale Island for preliminary photography. On 14 August, Dick and Warner chartered a Cessna 185 and flew the shoreline from Monashka Bay to Miner's Point and from Cape Chiniak to Uyak Island. Except for estimates of certain species, the data obtained on this flight were qualitative.

The survey procedure consisted simply of following the shoreline and counting or estimating the number of breeding pairs present. The

actual census methods varied with the species; cormorant and kittiwake nests could be counted directly or their numbers easily estimated; murrelets could be counted; the number of Tufted Puffins present on shore and on the water could be counted, while the number of active burrow entrances could only be estimated, often very roughly; the individuals of Pigeon Guillemots, Horned Puffins, Glaucous-winged Gulls, Arctic Terns, and Aleutian Terns could be counted and the minimum number of nests extrapolated. The accuracy of the estimates varied with the species, and was in many cases very low.

We generally marked survey areas off on maps and recorded data corresponding to the survey areas into a notebook or a cassette tape recorder. Colony locations were noted on the maps. Often, both observers estimated or counted each species in an area, and averaged their results.

Most of the breeding occurred on small islands. In the summarization of the survey data, single islands or island complexes were often designated colonies, in order to simplify the cataloguing. An isolated, monospecific mainland rookery, such as one of the cormorant colonies in Monashka Bay, was much less significant than an island complex like the Triplets, even though both were called colonies. The latter might contain many isolated monospecific colonies like the former. As a result, Table 3 (Distribution of colonies according to island size) lists a greater than actual proportion of colonies on the mainland. The problem of weighting is remedied by presenting, in Table 4, the Distribution of breeding pairs according to island size.

Throughout the study, numerous B/W photographs and color slides were taken. These were catalogued and listed on the Colony Status Record filled out for each colony.

## Results

Twenty-five colonies in Chiniak Bay and 34 in Marmot Bay were catalogued. Of these, 12 in Marmot Bay were surveyed by airplane and the rest in both bays by small boat. Colony numbers, coordinates of latitude and longitude, and geographic names are listed in Tables 1 and 2. Data from colonies from Whale Passage to Miner's Point are not included in these results, but are listed in Appendices 3 and 4.

Considering both bays, 79% of the colonies were located on islands smaller than 1.0 mi. in length (Table 3). The percentage would have been even higher had equal weight been given to mainland and small island colonies in cataloguing. Considering both bays, 80.7% of the breeding pairs were located on islands smaller than 1.0 mi. in length and 97.3% on islands smaller than 6.0 mi. in length. The mainland (Kodiak Island Proper) supported only 19% of the colonies and 2.3% of the breeding pairs. The seabirds' preference for small islands over the mainland is perhaps due to the lack of mammalian predators on most of the former.

The small (0.25-1.0 mi. in length) offshore islets utilized so extensively by seabirds are almost all similar in structure. They are low, ringed by sloping to vertical, bare or partly vegetated, broken or sheer sea cliffs, and by steep vegetated sea slopes. The tops of the islands are vegetated with the Elymus arenarius grass spp. - umbelliferous herb shore community (with undercover of other herbaceous plants and mosses) similar to that prevalent throughout the Aleutians. Shrubs and trees are sparse or absent. Cliff nesting species occupy the periphery of each island; Tufted Puffins occupy a narrow band between the zone of

dense grass and the cliff rim (also nesting on sea slopes where these occur); and Glaucous-winged Gulls occupy the top of the island, usually at the outer edge of the grass zone. Black Oystercatchers and Common Eiders nest on or very close to the shores of coves. With slight variations, this pattern is repeated again and again.

Fourteen breeding species were found in the bays (Table 7). The Tufted Puffin was the most abundant breeder, occupying 45.5% and 66.5% of the overall population in Chiniak and southern Marmot Bays, respectively (Tables 5 and 6). The Black-legged Kittiwake was second, occupying 39.6% and 28.5% of the overall population, respectively. The Glaucous-winged Gull, Pelagic Cormorant, and Horned Puffin followed in that order, all occurring at more than half of the catalogued colonies.

The Pigeon Guillemot presented special problems in censusing, and it is likely that its breeding abundance was several times that found in this study. It tended to nest scattered along stretches of shore occupied by no other seabirds, both on the mainland and on offshore islets, though it also nested among polyspecific colony complexes. This was also true of the Horned Puffin. The two species were close to one another in breeding abundance, as was indicated in the transect study run concurrently with the colony study (Dick, Warner, and MacIntosh, 1975).

The number of pairs counted or estimated at each colony are given in Appendices 1-3.



Table I  
Colony Numbers and Localities, Chiniak Bay

<u>Colony #</u>	<u>Coordinates</u>	<u>Geographic Name</u>
CB-1	57-38-08N 152-08-06W	Islet marked Hole $\Delta$ , about 0.6 mi. NE of Chiniak Island.
CB-2	57-37-40N 152-08-24W	Group of stacks E-NE of Chiniak Island.
CB-3	57-38-00N 152-09-24W	Small Island NW of Chiniak Island.
CB-4	57-37-35N 152-09-00W	Chiniak Island.
CB-5	57-38-25N 152-19-25W	Kekur Island.
CB-6	57-38-30N 152-21-51W	Middle Island.
CB-7	57-38-00N 152-21-20W	Svitlak Island.
CB-8	57-37-30N 152-22-00W	Utesistoi Island.
CB-9	57-36-30N 152-24-20W	Point marked Inner $\Delta$ , first point N of mouth of Myrtle Creek, Kalsin Bay.
CB-10	57-38-55N 152-25-10W	Jug Island.
CB-11	57-39-45N 152-24-20W	Kalsin Island.
CB-12	57-40-40N 152-22-45W	Queer Island.
CB-13	57-42-15N 152-26-15W	Viesoki Island.
CB-14	57-43-54N 152-26-55W	Cliff Island.
CB-15	57-43-50N 152-27-50W	Zaimka Island.
CB-16	57-43-15N 152-29-20W	Blodgett Island..
CB-17	57-42-25N 152-32-00W	Mary Island.
CB-18	57-42-00N 152-31-30W	Mainland SSE of Mary Island.
CB-19	57-46-34N 152-26-45W	Gibson Cove Kittiwake Colony.
CB-20	57-45-20N 152-26-00W	Puffin Island.
CB-21	57-46-30N 152-23-00W	Kulichkof Island.
CB-22	57-46-00N 152-24-10W	Popof Island.
CB-23	57-46-46N 152-22-48W	Holiday Island.
CB-24	57-47-06N 152-22-12W	Bird Island.
CB-25	57-46-00N 152-17-00W	Long Island.

Table 2  
Colony Numbers and Localities, Marmot Bay

<u>Colony #1-</u>	<u>Coordinates</u>	<u>Geographic Name</u>
*MB-1	557-54-30N 152-30-50W	Otmeloi Point vicinity.
*MB-2	57-54-45N 152-33-20W	Low Island.
*MB-3	57-51-30N 152-47-00W	Rock off Kekur Point.
*MB-4	57-46-00N 152-51-45W	Δ Reef 2 on Kodiak D-3 quadrangle.
*MB-5	57-49-30N 152-25-30W	In vicinity of Blōw Δ, Monashka Bay.
*MB-6	57-49-30N 152-23-55W	Mainland cliff 200 m. upbay from Ram Sity., Monashka Bay.
*MB-7	57-48-55N 152-54-00W	Mainland, Barabara Cove vicinity.
*MB-8	57-49-25N 152-53-45W	Peninsula N. of Barabara Cove.
*MB-9	57-49-23N 152-53-30W	Trout Δ, Kizhuyak Bay.
*MB-10	57-58-30N 152-42-30W	Treeless Island
*MB-11	57-56-58N 152-56-11W	Chernof Point, Kupreonof Strait.
*MB-12	57-55-50N 152-50-10W	Koniuji Island.
MB-13	57-49-11N 152-25-24W	Head of Monashka Bay, S. end.
MB-14	57-49-55N 152-26-02W	Mainland and stack, S. edge of Monashka Creek Cove.
MB-15	57-50-53N 152-24-06W	Sea stack, N. shore of Monashka Bay.
MB-16	57-53-10N 152-23-50W	Eider Island.
MB-17	57-53-35N 152-24-40W	Nelson Island.
MB-18	57-53-30N 152-20-51W	Island at S. end of Icon Bay.
MB-19	57-56-40N 152-31-03W	Islet marked Δ Small, about 1 mi. SW of Wooded Island.
MB-20	57-59-15N 152-28-30W	The Triphets.
MB-21	57-57-36N 152-24-30W	Group of islets at mouth of Island Bay, Spruce Island.
MB-22	57-56-24N 152-24-42W	Stack 0.3 mi. SW of Sol Δ, Kodiak D-2 Quad.
MB-23	57-52-19N 152-38-51W	*Islet 1", Anton Larsen Bay.
MB-24	57-52-11N 152-39-06W	*Islet 2", Anton Larsen Bay.
MB-25	57-51-58N 152-38-58W	*Islet 3", Anton Larsen Bay.

1. Asterisk indicates colony was cataloged in aerial survey,  
14 August 1975.

Table 2  
Colony Numbers and Localities, Marmot Bay (Con't.)

<u>Colony #</u>	<u>Coordinates</u>	<u>Geographic Name</u>
MB-26	57-52-49N 152-39-26W	L-shaped Island, mouth of Anton Larsen Bay.
MB-27	57-53-03N 152-39-03W	Middle Island in string of three, mouth of Anton Larsen Bay.
MB-28	57-53-08N 152-38-57W	NE islet in group of three, Anton Larsen Bay mouth.
MB-29	57-53-54N 152-38-42W	"Islet 11", mouth of Anton Larsen Bay.
MB-30	57-53-12N 152-40-03W	"Islet 13", mouth of Anton Larsen Bay.
MB-31	57-52-50N 152-40-54W	Islet 0.4 mi. W. of Crag Point, near mouth of Anton Larsen Bay.
MB-32	57-52-12N 152-42-36W	Islet marked $\Delta$ Man 2, mouth of Sharatin Bay.
MB-33	57-55-35N 152-45-20W	Mainland kittiwake colony, Whale Island.
MB-34	57-56-50N 152-44-10W	Series of stacks NE of Orient Point, Whale Island.

Table 3. Distribution of Colonies  
According to Island Size

Island Size (Length)	Chiniak Bay		Marmot Bay		Both Bays	
	# of Colonies	%	# of Colonies	%	# of Colonies	%
<0.25 mi.	13	52	20	59	33	56
0.25-1.0 mi.	8	32	5	15	13	22
1.0-6.0 mi.	1	4	1	3	2	3
Mainland	3	12	8	23	11	19
Total	25	100	34	100	59	100

Table 4. Distribution of Breeding Pairs  
According to Island Size

Island Size (Length)	Chiniak Bay		Marmot Bay		Both Bays	
	# of Br. Pairs	%	# of Br. Pairs	%	# of Br. Pairs	%
<0.25 mi.	13,212	72.0	6,986	17.2	20,198	34.2
0.25-1.0 mi.	3,572	19.5	23,910	58.7	27,482	46.5
1.0-6.0 mi.	1,408	7.7	8,625	21.2	10,033	17.0
Mainland	142	0.8	1,195	2.9	1,337	2.3
Total	18,334	100.0	40,716	100.0	59,050	100.0

Table 5  
Species Composition and Frequency of Occurrence  
in Breeding Colonies, Chiniak Bay

<u>Species</u>	<u># of Pairs</u>	<u>%</u>	<u>Freq. Occurrence</u>	<u>%</u>
Pelagic Cormorant	501	2.7	16	64
Red-faced Cormorant	316	1.7	13	52
Unidentified Cormorant	30	0.2	-	-
Glaucous-winged Gull	1,072	5.8	14	56
Mew Gull	60	0.3	1	4
Black-legged Kittiwake	7,261	39.6	11	44
Arctic Tern	75	0.4	2	8
Aleutian Tern	50	0.2	3	12
Black Oystercatcher	18	0.1	10	40
Common Murre	229	1.2	4	16
Pigeon Guillemot	162	0.9	12	48
Horned Puffin	204	1.1	13	52
Tufted Puffin	8,348	45.5	21	84
Common Eider	8	<0.1	2	8
Total	18,334	100.0	25	100

Table 6\*  
Species Composition and Frequency of Occurrence  
in Breeding Colonies, Marmot Bay

<u>Species</u>	<u># of Pairs</u>	<u>%</u>	<u>Freq. Occurrence</u>	<u>%</u>
Pelagic Cormorant	195	0.5	10	45
Red-faced Cormorant	30	0.1	6	27
Double-crested Cormorant	2	<0.1	1	5
Unidentified Cormorant	130	0.3	-	-
Glaucous-winged Gull	1,585	1.5	14	64
Mew Gull	1	<0.1	1	5
Black-legged Kittiwake	10,891	28.5	6	27
Arctic Tern	108	0.3	2	9
Black Oystercatcher	6	<0.1	6	27
Common Murre	600	1.6	1	5
Pigeon Guillemot	84	0.2	5	23
Horned Puffin	1181	0.5	12	54
Tufted Puffin	25,406	66.5	16	73
Total	38,219	100.0	22	100

\* Data from colonies MB-1 to MB-12, which were surveyed aurally, are not included in this table.

Table 7\*  
Species Composition and Frequency of Occurrence  
in Breeding Colonies, Marmot and Chiniak Bays

<u>Species</u>	<u># of Pairs</u>	<u>%</u>	<u>Freq. Occurrence</u>	<u>%</u>
Pelagic Cormorant	696	1.2	26	55
Red-faced Cormorant	346	0.6	19	40
Double-crested Cormorant	2	<0.1	1	2
Unidentified Cormorant	160	0.3	-	-
Glaucous-winged Gull	1,657	2.9	28	60
Mew Gull	61	0.1	2	4
Black-legged Kittiwake	18,152	32.1	17	36
Arctic Tern	183	0.3	4	9
Aleutian Tern	50	0.1	3	6
Black Oystercatcher	24	<0.1	16	34
Common Murre	829	1.5	5	11
Pigeon Guillemot	246	0.4	17	36
Horned Puffin	285	0.5	25	53
Tufted Puffin	33,754	59.6	37	79
Common Eider	8	<0.1	2	4
Total	56,553	100.0	47	100

\* Data from Colonies MB-1 to MB-12, which were surveyed aurally, are not included in this table.

Kittlitz's and Marbled Murrelets occupied 3.6% of the total individuals identified in the offshore transects (Dick et. al., 1975). They certainly nested on large wooded islands (Long Island, Spruce Island, Whale Island) and on mainland Kodiak. Due to the nature of their nesting habitat, no colonies of these species were identified.

#### Literature Cited

Dick, M., I.M. Warner and R. MacIntosh. 1975. Small boat census of seabirds, Marmot and Chiniak Bays, June-August, 1975. Technical Report, USFWS, OBSCE, Anchorage, Alaska.



## APPENDICES

### Abbreviations

WK	Western Kodiak
MB	Marmot Bay
CB	Chiniak Bay
DDC	Double-crested Cormorant
PC	Pelagic Cormorant
UC	Unidentified Cormorant
RFC	Red-faced Cormorant
CE	Common Eider
BOC	Black Oystercatcher
MG	Mew Gull
GWG	Glaucous-winged Gull
BLKW	Black-legged Kittiwake
ART	Arctic Tern
ALT	Aleutian Tern
PG	Pigeon Guillemot
CM	Common Murre
TP	Tufted Puffin
HP	Horned Puffin
X	Thought to Breed

APPENDIX 1 Nesting Pairs at Chiniak Bay Colonies. Colony numbers refer to Table 1.

CB#	PC	RFC	UC	GWG	BLKW	PG	CM	HP	TP
1	-	-	-	14	333	-	9	-	-
2	16	2	-	-	3,563	-	100	-	40
3	-	-	-	X	23	-	-	-	460
4	8	-	-	90	31	10	-	5	2,640
5	25	45	-	-	285	-	20	-	125
6	2	X	-	10	-	20	-	-	150
7	46	1	-	200	14	2	-	1	350
8	1	1	-	5	1,155	5	-	-	75
9	-	-	-	-	-	-	-	1	15
10	10	-	-	X	-	2	-	-	-
11	36	58	-	30	-	7	-	11	50
12	4	2	4	10	20	-	-	45	625
13	22	103	-	-	1,306	2	100	3	900
14	-	2	-	25	-	-	-	-	400
15	17	22	-	400	20	-	-	20	1,000
16	-	-	-	-	-	-	-	-	-
17	-	-	-	26	-	20	-	10	5
18	-	-	-	-	-	-	-	-	-
19	-	-	-	-	114	-	-	1	2
20	39	17	-	165	-	15	-	15	330
21	25	5	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	10	15
23	43	-	-	16	5	-	-	-	78
24	56	3	-	4	-	-	-	1	-
25	151	55	26	77	142	39	-	83	833

APPENDIX 2 - Nesting pairs at Marmot Bay colonies surveyed by small boat.  
Colony numbers refer to Table 2.

MB#	PC	RFC	UC	GWG	BLKW	PG	CM	HP	TP
13	5	7	-	-	-	-	-	-	-
14	21	21	-	2	-	-	-	-	46
15	10	1	-	8	-	-	-	-	10
16	26	1	-	100	-	2	-	15	1,410
17	53	-	-	4	-	-	-	8	355
18	-	-	-	5	-	-	-	1	175
19	-	-	-	-	-	-	-	-	15
20	14	2	120	200	-	-	600	20	20,000
21	20	-	-	30	-	15	-	1	1,900
22	-	-	-	-	-	-	-	-	15
23	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-
26	1	-	-	50	87	20	-	20	-
27	-	-	-	30	563	-	-	30	600
28	-	-	-	-	-	-	-	-	35
29	-	-	-	1	100	-	-	-	175
30	20	-	-	90	-	-	-	20	200
31	-	-	-	-	-	2	-	-	300
32	-	-	-	10	114	-	-	20	-
33	-	-	-	5	8,530	45	-	15	30
34	23	-	10	50	1,495	-	-	25	140

APPENDICES 1 and 2 Continued - Nesting pairs at Chiniak and Marmot Bays.  
Colony numbers refer to Tables 1 and 2.

CB#	DDC	CE	BOC	MG	ART	ALT
6	-	-	2	-	-	-
7	-	-	1	-	-	-
8	-	-	1	-	-	-
11	-	-	1	-	-	-
12	-	-	3	-	-	-
15	-	5	2	-	-	-
16	-	-	-	-	30	15
17	-	-	3	60	45	25
18	-	-	-	-	-	10
20	-	3	2	-	-	-
23	-	-	1	-	-	-
25	-	-	2	-	-	-

MB#

16	-	-	1	-	-	-
18	-	-	1	-	-	-
19	-	-	1	-	-	-
21	2	-	-	-	-	-
23	-	-	1	1	-	-
24	-	-	-	-	101	-
25	-	-	-	-	7	-
26	-	-	1	-	-	-
31	-	-	1	-	-	-

APPENDIX 3 - Colony numbers and localities, Western Kodiak, 14 August  
aerial survey.

<u>Colony #</u>	<u>Coordinates</u>	<u>Geographic Name</u>
WK 1	57-57-24 N 153-06-00 W	Island W. of Bare Island Kupreonof Strait
WK 2	57-54-00 N 153-14-00 W	Island off Naugolka Point
WK 3A	57-56-18 N 153-33-42 W	Noisy Islands - northernmost
WK 3B	57-55-30 N 153-33-00 W	Noisy Islands - southernmost
WK 4	57-48-24 N 153-17-00 W	Three islands in Uganik Passage
WK 5	57-44-00 N 153-32-30 W	Two islands in Uganik Bay south of Village Islands
WK 6	57-46-24 N 153-28-42 W	Just SE of Rock Point, Uganik Bay
WK 7A	57-47-00 N 153-31-30 W	Village Islands, Island A
WK 7B	57-46-48 N 153-32-00 W	Village Islands, Island A 1
WK 7C	57-46-24 N 153-31-30 W	Green Island
WK 7D	57-46-36 N 153-32-00 W	Village Islands, Island C
WK 7E	57-47-42 N 153-32-30 W	Village Islands, Island E
WK 7F	57-48-00 N 153-32-30 W	Village Islands, Island E 1
WK 7G	57-48-18 N 153-32-30 W	Village Islands, Island F

APPENDIX 4 - Nesting pairs and qualitative information from the 14 August aerial survey. Colony numbers refer to Appendix 3.

MB#	UC	GWG	BLKW	PG	HP	TP
1	x	2	-	-	-	15
2	x	x	x	-	x	800
3	x	x	200	-	-	-
4	x	x	-	-	-	200
5	x	-	-	-	-	-
6	x	-	-	-	-	-
7	5	10	-	-	-	10
8	30	-	1,000	-	-	-
9	-	-	100	-	-	-
10	x	-	-	-	-	50
11	-	-	-	-	4	-
12	x	-	-	-	-	60
WK#						
1	-	-	1,500	-	-	500
2	15	50	700	-	2	800
3A	40	500	500	-	-	7,000
3B	30	50	50	-	4	1,000
4	x	235	375	-	-	330
5	x	-	140	-	-	110
6	10	-	-	-	-	-
7A	100	250	-	-	-	800
7B	-	20	-	-	-	-
7C	20	30	10	-	-	70
7D	15	10	-	2	-	-
7E	-	25	-	4	-	30
7F	-	35	-	-	-	50
7G	-	7	-	-	-	30
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