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Wildlife Surveys in the Nearshore Waters of the Delarof Islands in August 2005

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Nearshore boat surveys were conducted throughout the Aleutian Islands Unit of Alaska Maritime National Wildlife Refuge in the late 1970s and early 1980s (e.g., Day et al. 1978) to document numbers of birds and marine mammals using the nearshore (e.g., within 200 m of shore) marine waters and to document nesting colonies of ledge-nesting seabirds. In 2003 we began a program to repeat these surveys with a special focus on cormorants, particularly red-faced cormorants (*Phalacrocorax urile*) an endemic species in the region about which little is known. We also were interested in changes in species (e.g., common eider, pigeon guillemot) that might be expected to increase after introduced foxes were removed from various islands.

We surveyed the Near Islands in 2003 and found that cormorants had declined substantially between the late 1970s and early 2000s (Byrd and Williams 2004), so we decided to survey areas farther east to determine whether the decline was more widespread than just the western Aleutians. The Rat Islands were surveyed in 2004 (Byrd et al. 2004), and we moved to the Delarof Islands in 2005 (Fig. 1). Due to fog and persistent southerly winds, our survey in 2005 resulted in complete coverage of only Gareloi Island and portions of five other islands. Nevertheless, results from these partial island surveys afford some comparisons with earlier counts, and allow us to address the primary question concerning cormorant declines.

METHODS

Two crews of three people operated in inflatable boats which ran as close to 50 m from shore as kelp and seas permitted. All birds observed were counted except very common species like auklets near Gareloi. Particular attention was directed to cormorants and we tried to record all birds classifying them to species (red-faced or pelagic) and age (adult or juvenile) when views were adequate. We also recorded all cormorant nests and in areas where we could approach closely enough, we recorded the number of chicks in nests. The only other ledge nesting species were black-legged kittiwakes and common and thick-billed murres and we also counted them. Data were recorded using the same shoreline segments described during earlier surveys (see Appendix A).

Besides the authors, observers were Rob Campallone, USFWS; Barry Sampson, Minnesota DNR; and Jason Bryant, Univ. of South Carolina.

RESULTS

Because of difficult observing conditions throughout the survey period, August 6-8, we were only able to survey the coastline of Gareloi completely. Partial surveys were completed on Ogliuga, Skagul, Kavalga, Ulak, and Amatignak (see Fig. 1). Generally the south sides of islands were not surveyed due to a persistent southerly wind and dense fog and rain which made visibility particularly difficult. In spite of conditions we were able to complete surveys of 26 of 33 designated coastline segments on the 6 islands. The highest number of cormorants and tufted puffins were detected on the high islands of Amatignak, Ulak, and Gareloi (Table 1). Common eiders were most abundant on the low

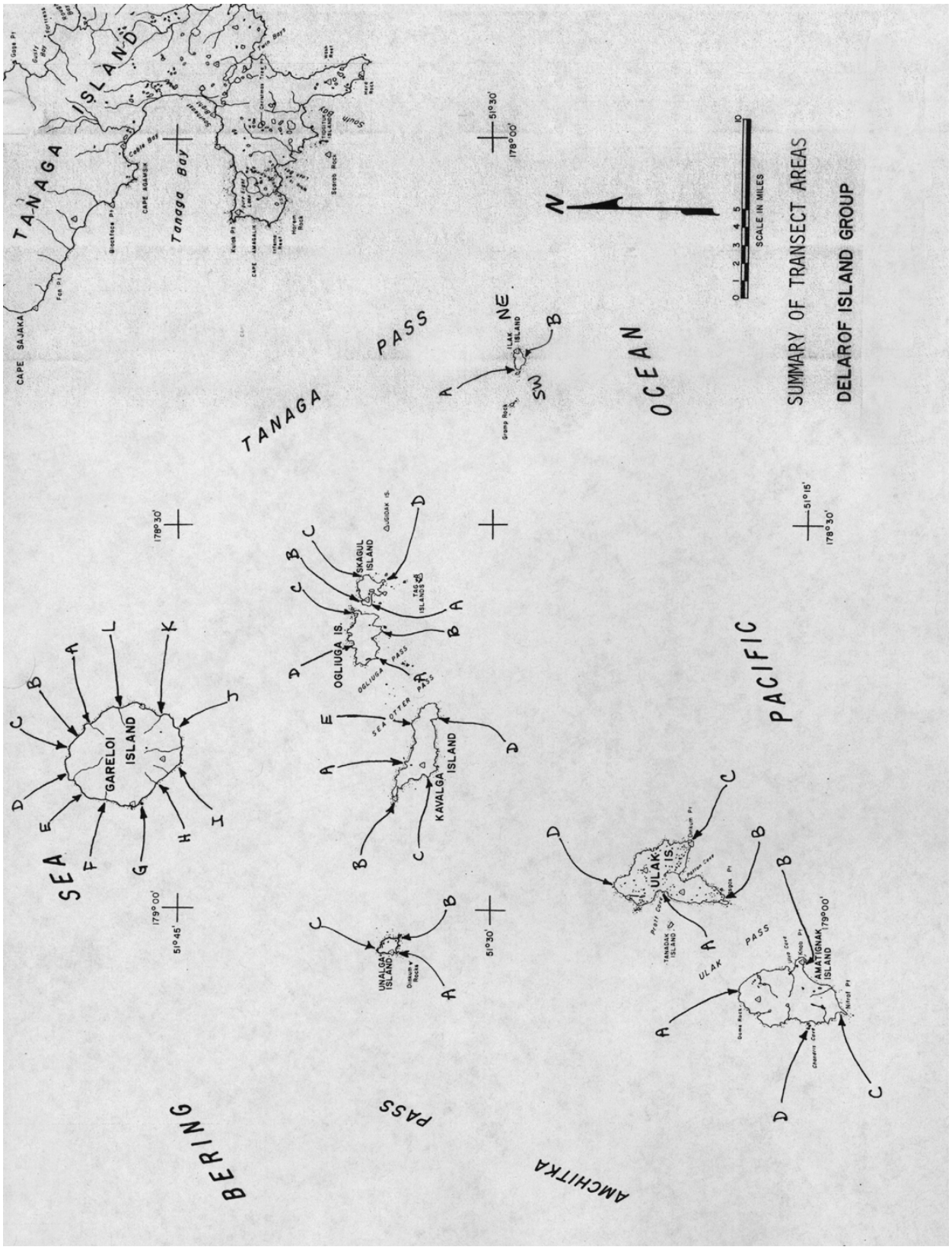

Figure 1. Map of Delarof Islands showing survey segments (e.g. segment A-B etc.).

islands (Ogliuga, Kavalga, and Skagul) and that is where we saw the most eider crèches. Gulls were common on all the islands, and pigeon guillemots were fairly common on all the islands except Amatignak which seemed to have lower densities than the other islands.

We were able to see cormorant nest contents only in a few spots, but it appeared the birds were having a fairly successful breeding season, as the majority of nests had chicks (Table 2), and the average brood size for both species, 2.45 and 2.25 chicks per brood respectively, was average or above. Information on other species recorded on surveys is included in Appendix A.

Table 1. Counts of birds in the Delarof Islands in 2005.

Species[a]	Gareloi	Ogliuga	Skagul	Kavalga	Ulak	Amatignak
UNCO	61	85	0	65	47	33
RFCO	85	8	0	16	52	383
PECO	92	4	18	57	181	31
Total Cormorants	238	97	18	138	280	447
COEI	0	329	89	195	11	125
GWGU	595	680	195	452	765	290
PIGU	117	124	62	90	127	22
TUPU	1595	0	2	87	355	445

[a]Codes: UNCO=unidentified cormorant, RFCO=red-faced cormorant, PECO=pelagic cormorant, COEI=common eider, GWGU=glaucous-winged gull, PIGU=pigeon guillemot, TUPU=tufted puffin

Table 2. Cormorant productivity from samples in the Delarof Islands in 2005

Species	Empty	Occupied	1 chick	2 chick	3 chick	4 chick
RFCO	24		8	13	18	5
PECO	6	2	8	8	9	3

DISCUSSION

We counted more than 1,200 cormorants during surveys of Gareloi and portions of the 5 other largest islands in the Delarof Group. Unalga, Ilak, and smaller islets near some of the larger islands were not surveyed. Nevertheless, it seems likely that cormorant populations have not declined in this area since 1977 because even with partial surveys we found more cormorants on each of the 6 islands we did survey than were found

previously (Table 3). Red-faced cormorants appeared to be much more common than pelagic cormorants in 2005, but no comparison was possible because most individuals were not identified to species in 1977.

Counts of common eiders, pigeon guillemots, and tufted puffins also indicated increases have occurred since the late 1970s. Introduced foxes were removed from Gareloi, Ulak, and Amatignak in the 1990s. Few if any common eiders were nesting on these islands prior to fox removal, and none were seen near the islands during surveys in 1977. We failed to find any eiders near Gareloi in 2005, but the island offers little nesting and brood rearing habitat for eiders, but it appeared some eiders were again nesting on Ulak and Amatignak. Furthermore, eiders increased on other islands in the Delarofs as well, where fox predation had not been a factor. Counts of tufted puffins at nesting colonies are highly variable, so are only rough indices of population levels, still the only increases occurred on the islands where foxes had been removed. Pigeon guillemots appeared to increase at every island, but the largest increase occurred at Gareloi following fox removal.

Interestingly, numbers of gulls were down on most islands, possibly as a result of incomplete counts in 2005, but clearly they did not increase like the other species mentioned above.

The magnitude of differences in numbers for the species we selected for comparisons is inaccurate for the islands where we only completed partial surveys because the 2005 counts are compared with whole island counts in 1977. Nevertheless, it is clear that higher numbers in 2005 represent increases probably greater than the % change calculated in the tables.

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Table 3. Comparative counts of cormorants and other species of birds in the nearshore waters of the Delarof Islands

	Gareloi			Ogliuga			Skagul			Kavalga			Ulak			Amatignak		
Species	1977	2005	%Δ	1977	2005[a]	%Δ	1977	2005[a]	%Δ	1977	2005[a]	%Δ	1977	2005[a]	%Δ	1977	2005[a]	%Δ
UNCO	79	61		13	85		4	0		65	65		199	47		258	33	
RFCO		85			8			0			16			52		1	383	
PECO	12	92			4			18			57		1	181		6	31	
Total Corm	**91**	**238**	***161.5***	**13**	**97**	***646.2***	**4**	**18**	***350.0***	**65**	**138**	***112***	**200**	**280**	***40.0***	**265**	**447**	***68.7***
COEI	0	0	=	119	329	*176.5*	8	89	*1012.5*	13	195	*1400*	0	11	+	0	125	+
GWGU	123	117	*-4.9*	140	124	*-11.4*	103	62	*-39.8*	91	90	*-1.1*	99	127	*28.3*	111	22	*-80.2*
PIGU	22	595	*2604.5*	133	680	*411.3*	22	195	*786.4*	51	452	*786.3*	136	765	*462.5*	43	290	*574.4*
TUPU	633	1595	*152.0*	5	0	-	0	2	-	117	87	*-25.6*	269	355	*32.0*	45	445	*888.9*

[a] Partial Survey, see Appendix A

Appendix A. Survey results from individual islands.

Gareloi

We surveyed Gareloi on 8 August between 0930 and 1330 h. Conditions were fairly good with relatively calm seas and high overcast with intermittent fog and little rain. Kelp was fairly extensive, but it was not extremely dense, so we were able to get fairly close to shore (usually within 50 m) by working our way into leads in the kelp periodically and scanning the nearshore waters and coast lines.

Kittiwakes and murres nest in a colony on the south side of the island, and we counted 971 kittiwakes but only 43 nests (Table A1). Clearly reproduction was poor in 2005 and birds were flighty and probably not attending the colony normally. We saw only 6 nests with single chicks; all still small, not yet with any contour feathers. The remaining nests were empty. Also, we saw places that probably had contained nests earlier in the season based on white wash but nest material had disappeared before our visit. Possibly well formed nests were never constructed due to early failure. Our count of birds and nests is probably not representative of how many birds might have been present at the beginning of the breeding season.

We counted 184 murres, approximately 105 were thick-billed and 79 were common murres. At least a few were brooding chicks, but many seemed to just be standing around without chicks.

A total of 238 cormorants were counted; 85 red-faced, 92 pelagic, and 61 unidentified. Although most of the birds appeared to be in adult plumage, we found only 10 nests, 9 pelagic and 1 unidentified.

There is a northern fulmar colony at Gareloi, and we saw several hundred birds flying around, but most of the area where the flying birds were seen was high up on the cliff and obscured in the fog. Therefore we were unable to count fulmars.

Glaucous-winged gulls were fairly common. We counted 424 adults and 171 juvenile birds. A few fledglings were included in the juvenile total.

Pigeon guillemots were fairly widespread. A total of 117 were counted. Both horned and tufted puffins were fairly common and we counted what we saw incidentally to the other species.

Gareloi has a large colony of crested, least, and parakeet auklets (Day et al. 1978) so it was not surprising to see a number of raptors; 3 adult and 5 juv. bald eagles, 17 peregrine falcons, and 7 common ravens.

Few marine mammals were noted (Table A-1).

Table A1. Summary of Circumnavigation Surveys at Gareloi Island, August 8, 2005														
Species		A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-K	K-L	L-A	Total
NOFU[a]							3		200*					
HADU												16		16
UNCO			2		2	6	9	21	2	6	6	4	3	61
UNCO Nests						1								1
ad			2		2	6	9			6		4		29
juv						0								0
RFCO		1	6			5	21	2	2	24		4	3	85
RFCO nests														0
ad		1	4	13		5	21	2	2	24		2	3	77
juv			2	4		0						2		8
PECO		3	2	8		18	9	2	3	15	8	9	12	92
PECO nests						6					3			9
ad		3	2	6	3	17	9	2	3	15	7	8	12	87
juv				2	0	1					1	1		5
BLOY		0	0	0	0	1	1	0	0	0	0	0	5	7
GWGU ad		8	1	18	27	18	20	50	9	23	105	30	115	424
GWGU im		0	0	5	13	9	40	0	6	0	33	9	56	171
BLKI		0	0	0	0	5	0	0	965	0	1	0	0	971
BLKI nests		0	0	0	0	0	0	0	43	0	0	0	0	43
UNMU														0
TBMU		0	0	0	0	0	5	0	100	0	0	0	0	105
COMU		0	0	0	0	3	1	0	75	0	0	0	0	79
PIGU		0	0	1	6	27	31	0	0	26	12	0	14	117
PAAU				1	16	12	40				34	278		381
HOPU		0	30	36	49	137	88	25	0	135	43	209	70	822
TUPU		0	50	51	75	181	409	49	0	26	33	641	80	1595
PAJA							1							1

BAEA ad				2									1	3
BAEA im													5	5
PEFA			1	2	2	1			2	1	6		2	17
CORA							2						5	7
SEOT		1					1							2
HASE							1							1
STSL							14							14
	Date	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug	8-Aug
	Time					10:20	10:00		930	1430				
	Obs	T2	T2	T2	T1	T1	T1	T2	T 2	T1	T1	T 1	T1	
	Cond.	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15	SW 15
	Team1	JW,BS,JB		Team2	VB,DC,RC									
	Complete survey took from 0930 to 1430: we did not keep track by segment													
	Seas were good for the surveys and we had fog on and off that reduced visibility, nevertheless conditions were generally good for counting													

[a]Codes used in this table and others below: NOFU=northern fulmar, HADU=harlequin duck, UNCO=unidentified cormorant, RFCO=red-faced cormorant, PECO=pelagic cormorant, BLOY=black oystercatcher, GWGU=glaucous-winged gull, BLKI=black-legged kittiwake, UNMU=unidentified murre, TBMU=thick-billed murre, COMU=common murre, PIGU=pigeon guillemot, PAAU=parakeet auklet, HOPU=horned puffin, TUPU=tufted puffin, PAJA=parasitic jaeger, BAEA=bald eagle, PEFA=peregrine falcon, CORA=common raven, SEOT=sea otter, HASE=harbor seal, STSL=Steller sea lion, COEI=common eider, RUTU=ruddy turnstone, RNPH=red-necked phalarope, ROSA=rock sandpiper.

*Many more birds were present in the fog, but we could not get a good count.

Ogliuga

On 6 August we surveyed three of four sections, but two of these were only partially surveyed (Table A2). Conditions were only fair because of rain and reduced visibility. Ogliuga has few cliffy areas, so nesting habitat for cormorants was somewhat limited. We counted 97 cormorants, most unidentified, but we did not see any nests. Common eiders were particularly common, and we counted 321 birds. Most were in flocks of molting males and females, but we also saw at least 7 creches. We also recorded 150 harlequin ducks.

Nearly 700 glaucous-winged gulls were counted, mostly adults. Also common were pigeon guillemot and horned puffins.

Skagul

Two of four sections were surveyed on 6 August in rain and fair visibility. We saw 20 cormorants, 2 red-faced and 18 pelagic. A total of 89 common eiders were recorded, and 195 glaucous-winged gulls were seen (Table A3). Pigeon guillemots were relatively common; 62 being counted.

Kavalga

Four of five sections were surveyed, but one was only a partial. The first two segments were surveyed on 6 August in rain and 25 kts of wind, and the others were counted on 8 August when there was a large southerly swell and we were unable to get very close to shore on the south side.

We counted 138 cormorants, more than half that we could not assign to species. Common eiders were prevalent, and we counted 195 birds and noted 11 creches (Table A4). A total of 452 glaucous-winged gulls were counted, mostly adults. We saw 90 pigeon guillemots.

Table A2. Summary of Circumnavigation Surveys at Ogliuga Island, August 7, 2005

Species	A-B	B-C	C-D	D-A	Totals
COEI ad male		50	37	63	150
COEI female		3	78	90	171
Creches		3	6	8	17
Unk		8			8
HADU		6	28	116	150
UNCO				85	85
UNCO Nests					0
UNCO ad					0
UNCO im					0
RFCO				8	8
RFCO nests					0
ad					0
im					0
PECO		1	2	1	4
PECO nests					0
ad		1			1
im					0
BLOY		3	4	5	12
RNPH		3	5		8
RUTU		3			3
ROSA		1	3	10	14
GWGU ad		153	117	270	540
GWGU im		102	13	25	140
UNMU					0
TBMU				2	2
COMU					0
PIGU		8	46	70	124
HOPU			44	79	123
TUPU					0
BAEA ad			1	1	2
BAEA im				1	1
PEFA					0
CORA			1		1
PAJA		2		2	4
SEOT			3/2	2	2
HASE			2	2	4
STSL			2		2
Date		6-Aug	6-Aug	6-Aug	
Time			1300-1540	1300-1530	
Observers		JW,DC,JB	JW/VB	VB,RC,BS	JW,DC,JB
Notes		partial		stopped at breakers	

Table A3. Summary of Circumnavigation Surveys at Skagul Island 6 August 2005						
Species		A-B	B-C	C-D	D-A	Totals
COEI ad male		18	55			73
COEI female			16			16
HADU			17			17
UNCO						0
UNCO Nests						0
RFCO						0
RFCO nests						0
ad			2			2
PECO						18
PECO nests						0
ad		3	15			18
im						0
BLOY			6			6
RNPH			5			5
GWGU ad		2	174			176
GWGU im			19			19
BLKI		10				10
PIGU			62			62
HOPU		1	29			30
TUPU			2			2
BAEA ad						0
BAEA im						0
PEFA						0
CORA						0
PAJA			3			3
SEOT			1			1
HASE			1			1
STSL						0
Date		6-Aug	6-Aug			T
Observers		jw,dc,jb	jw,dc,jb			
Conditions		rain, s 25	rain, s 25			

Table A4. Surveys of Kavalga Coastline, 6-8 August 2005.							
Species		A-B	B-C	C-D	D-E	E-A	Totals
COEI							
M		13	26			15	54
F		3	22	2		114	141
Creches						11	11
HADU		4	9			6	19
UNCO		3	10	10		42	65
UNCO Nests						0	0
RFCO		0				16	16
RFCO nests						0	0
PECO		22	2	3		30	57
PECO nests						0	0
BLOY		3	1			18	22
GWGU (A)		119	30	41		209	399
GWGU (J)		40	13				53
GWTE						1	1
COMU			1				1
PIGU		19	30	10		31	90
PAAU						1	1
HOPU		4	30	29		5	68
TUPU		4	5	78			87
BAEA ad		3	4	2			9
BAEA im		2	2				4
PEFA			2	1		1	4
CORA			1			2	3
PAJA		1					1
SEOT						1	1
HASE						1	1
STSL						4	4
Date		6-Aug	8-Aug	8-Aug		6-Aug	
Time		0830-0945	1600-1630	1630-1730		0830-1030	
Observers		JW,DC,JB	JW,RC,BS	all		VB,RC,BS	
Conditions		S25,rain	S15,dry	partial,		S25,rain	
				big swell			
				only w.30%			
				and e 15%			
Adult RF		0				9	
Juv RF		0	1			7	
Adult PE		22	2			27	
Juv PE		0				3	

Ulak

On 7 August we surveyed the east and west sides of Ulak, but could not get the south side due to rough seas. There was a heavy overcast and occasional mist but no rain. About 280 cormorants were counted, the majority were pelagic cormorants (Table A5). We also counted 88 pelagic cormorant nests, and we were able to observe chicks in a number of nests: empty (6), adults present but contents not visible (2), 1 chick (8), 2 chicks (8), 3 chicks (9), and 4 chicks (3).

We counted 11 common eiders and 22 harlequin ducks, and there were more than 700 glaucous-winged gulls. Black oystercatchers (30) and pigeon guillemots (127) were relatively common. Puffins also were common at Ulak.

Amatignak

Two of four segments were surveyed on 7 August in heavy overcast and periodic rain. We counted 447 cormorants, the vast majority were red-faced (Table A6). Also, 91 red-faced nests and 10 pelagic nests were observed. Of 68 red-faced nests where contents could be seen, 24 were empty, 8 had 1 chick, 13 had 2 chicks, 18 had 3 chicks, and 5 had 4 chicks.

We saw 125 common eiders, all molting adults, and there were nearly 300 glaucous-winged gulls in the segments we surveyed. Twenty-two pigeon guillemots were counted and several hundred puffins were observed.

Table A5. Summary of Circumnavigation Surveys at Ulak Island, 7 August 2005								
Species		A-B	B-C	C-D	D-A	Totals		
COEI ad male						0		
creche					2	2		
COEI female		2			8	10		
COEI unk					1	1		
HADU		0		19	3	22		
UNCO		4		22	21	47		
UNCO Nests						0		
RFCO		12		25	15	52		
RFCO nests						0		
Ad		12		16	4	32		
Juv				9	11	20		
PECO		96		26	59	181	PECO Nests	
PECO nests		52			36	88		
Ad		82		16	44	142	empty	6
Juv		14		10	15	39	active	2
BLOY		10		5	15	30	1	8
GWGU ad		186		66	272	524	2	8
GWGU im		118		18	105	241	3	9
UNMU						0	4	3
TBMU						0		
COMU		3				3		
WHAU					1	1		
PIGU		55		11	61	127		
HOPU		69		72	127	268		
TUPU		50		174	131	355		
BAEA ad				1	1	2		
BAEA im					2	2		
PEFA		3				3		
CORA		2		4	10	16		
SOSP		20			1	21		
ROFI		3				3		
WIWR		2				2		
RTLO					2	2		
SEOT		1			1	2		
HASE								
STSL		haul site						
		not counted						
Date		7-Aug		7-Aug	7-Aug			
Time		1000-1300						
Obs.		VB,DC,RC		jw,bs,jb	jw,bs,jb			
Cond.		Fog, calm						
Comments		Ended at sea lions		partial (sq. knob n DinkumPt.				

Table A6. Summary of Circumnavigation Surveys at Amatignak Island, 7 August 2005.								
Species		A-B	B-C	C-D	D-A	Totals		
COEI ad male					45	45		
COEI female					5	5		
COEI unknown					75	75		
HADU		1			6	7		
UNCO		1			32	33		
UNCO Nests						0		
RFCO		21			362	383		
ad					45	45		
im					2	2		
RFCO nests					91	91		
PECO		2			29	31		
ad					9	9		
im					0	0		
PECO nests					10	10		
BLOY		2			5	7		
GWGU ad		12			253	265		
GWGU im		2			23	25		
COMU					69	69	Nesting in caves	
PIGU		3			19	22		
HOPU		11			303	314		
TUPU					445	445		
ROFI					12	12		
BAEA ad		2				2		
BAEA im		2				2		
PEFA					6	6		
CORA					4	4		
SEOT						0		
HASE						0		
STSL						0		
Date		7-Aug			7-Aug			
Time		1600-1800			1600-1745			
Obs		JW,BS,JB			VB,DC,RC			
Weather		rain			rain			
		partial						
Chicks		RFCO broods		PECO Broods				
1		8						
2		13		5				
3		18		2				
4		5						