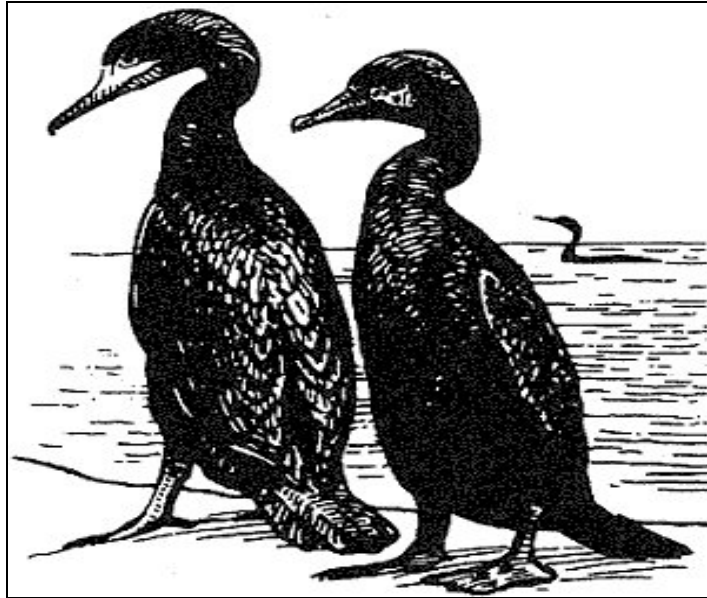


**CORMORANT OBSERVATIONS IN THE RAT ISLANDS, ALEUTIAN ISLANDS,
ALASKA, IN 2004, WITH NOTES ON OTHER SPECIES**



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Key Words: Aleutian Islands, Amchitka Island, Davidof Island, Khvostof Island, Kiska Island, Little Kiska Island, Little Sitkin Island, pelagic cormorant, *Phalacrocorax pelagicus*, *Phalacrocorax urile*, Pyramid Island, Rat Island, seabird surveys, red-faced cormorant, Segula Island, Semisopchnoi Island

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Red-faced (*Phalacrocorax urile*) and pelagic (*P. pelagicus*) cormorants are fairly common and widespread breeders and possibly residents in the Aleutian Islands, but little is known about population trends or meta-population structure. Largely anecdotal information about local declines in populations of red-faced cormorants, along with their restricted distribution in the western Gulf of Alaska and southern Bering Sea regions resulted in this species being included on the National Audubon Society “WatchList”, a designation to highlight declining and vulnerable bird populations. The majority of nesting areas for red-faced cormorant are on Alaska Maritime National Wildlife Refuge, but information about their numbers in most parts of the Aleutians is more than 20 years old. In 2003 the refuge staff and Doug Causey, curator of birds at the Museum of Comparative Zoology at Harvard University who is a world-renowned expert on cormorants, began a joint project to survey populations of cormorants in the Aleutian Islands.

In 2003 cormorants were counted in the westernmost Aleutian Islands group, the Near Islands, and substantially lower populations were found than had been recorded there previously (Byrd and Williams 2004). Due to the results of the Near Islands survey, we decided to try to survey the Rat Island group in 2004. Our Rat Islands survey was conducted from July 26-August 4, 2004. We were able to survey all the islands except Buldir, Tanadak, and the s. side of Amchitka. The objective was to document the number of cormorants in the Rat Islands to determine whether declines noted in the Near Island group in 2003 were also evident farther east. In addition to cormorants, crews kept track of other wildlife observed for comparison with earlier surveys conducted on most islands in this area in the late 1970s and early 1980s (Day et al. 1978, Day et al. 1979, Early et al. 1980, Dragoo and Deines 1983, White et al. 1977).

This report is a summary of the Rat Island results and conclusions. More detailed descriptions of the results for each island surveyed are included as appendices (A-G).

METHODS

Two crews of three observers each surveyed birds from 5-m inflatable boats operated as close to shore as sea conditions, kelp, and rocks would allow. In most cases observers were able to approach within 40-50 m of shore, but occasionally kelp restricted our approaches to no closer than 100 m. We focused on cormorants, but we also recorded other birds and marine mammals encountered. The authors had the expert assistance of Dr. Ian L. Jones and his assistants, Jacques Marais, Andrew Ritchie, and Joanne Dussureult from Memorial University, Newfoundland. Peter Trimble, Jeremiah’s father, a marine mammal and seabird expert, also provided assistance.

STUDY AREA

The Rat Island group is composed of 12 large islands and a number of associated very small satellite islands (Fig. 1). Introduced mammals reduced bird populations on the 7 larger islands, but no mammals have been successfully introduced on Little Kiska, Davidof, Khvostof, Pyramid, and Tanadak. Introduced foxes (*Alopex lagopus*) were removed from Amchitka by 1961, but

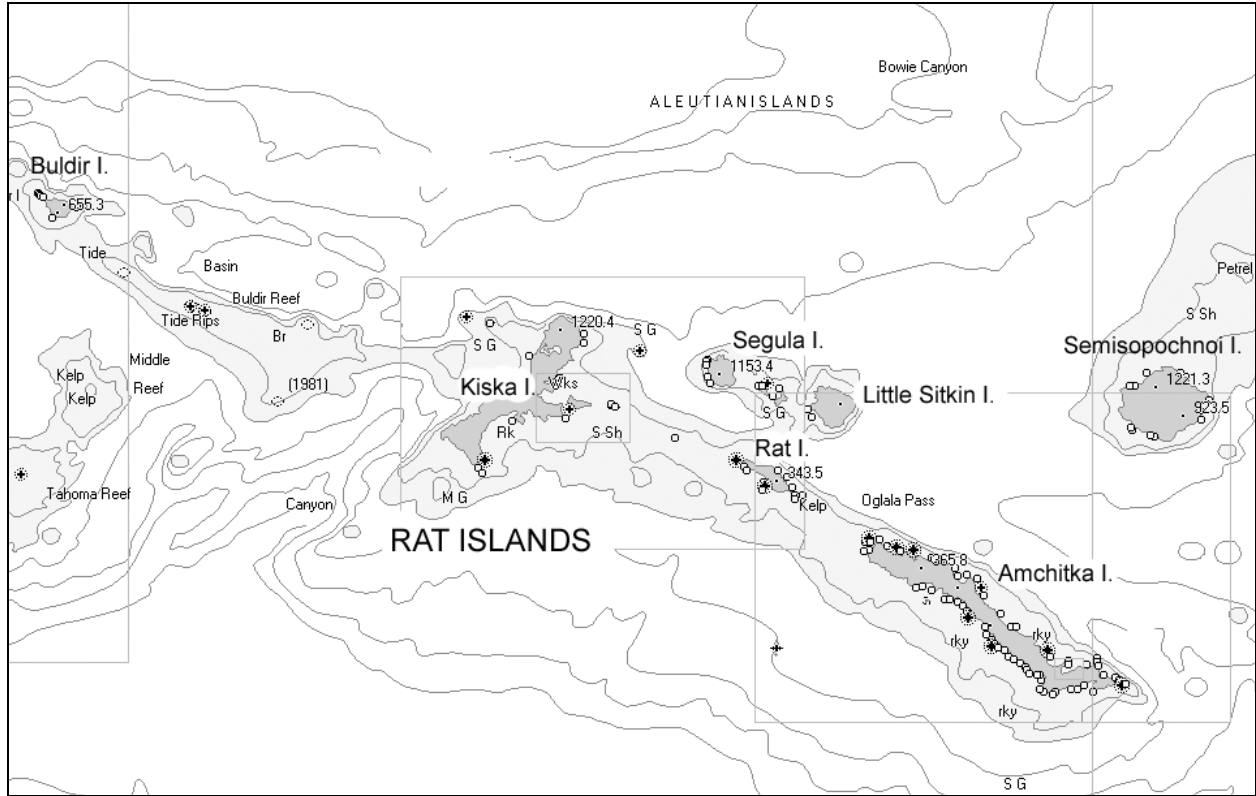


Figure 1. Map of the Rat Island Group where we conducted cormorant surveys in 2004. Davidof, Khvostof and Pyramid are small islands between Segula and Little Sitkin.

on Kiska, Segula, Little Sitkin, Rat and Semisopochnoi they were present until the mid-1980s (i.e., foxes were present when earlier cormorant and other bird surveys were conducted in the late 1970s and early 1980s). Introduced Norway rats (*Rattus norvegicus*) persist on Kiska, Rat, and Amchitka. Other substantial changes in the area have been the drastic declines in Steller sea lions since the 1970s and the recent (since 1990) declines in sea otters. Sea otters (*Enhydra lutris*) are keystone species in the nearshore zone and they influence the extent of the kelp forest since they prey on sea urchins, the major herbivore on kelp. As otters have declined so has the kelp forest.

RESULTS

Cormorant Counts

We counted 7,671 cormorants in the Rat Islands during comparative surveys in 2004 (Table 1). Another 1,300 cormorants were seen primarily on the north side of Amchitka. We were not able to count cormorants at Buldir, Tanadak or on most of the south side of Amchitka. Red-faced cormorants comprised a high of 93% at Semisopochnoi and a low of 21% at Segula of the cormorants we could classify to species (Table 2). Overall, 65% of the cormorants we identified were red-faced cormorants. All other identified cormorants were pelagic cormorants. Similar to species composition, the proportion of immature birds also varied among islands. For red-faced cormorants, up to 72% of the birds seen were immatures (i.e., had brown, worn plumage) on Amchitka but on Little Sitkin, Segula, and Davidof less than 10% were immature birds. Likewise, on the north side of Amchitka, 66% of the pelagic cormorants we saw were immatures, while at Khvostof and Pyramid islands only 3% of the pelagic cormorants we saw were not yet in adult plumage (Table 2).

Table 1. Counts of cormorants in the Rat Islands in the 1970s and early 1980s compared to 2004.

Island	1970s-1980s	2004	Difference
Semisopochnoi	400	2874	+619%
Little Sitkin	199	351	+76%
Kiska	913	2763	+203%
Little Kiska	179	249	+39%
Segula	258	183	-29%
Davidof	220	252	+15%
Khvostof/Pyramid	132	206	+56%
Rat	170	793	+366%
Amchitka	2000	1307 (n side only)	
Tanadak	123	No survey	
Totals (minus Amchitka, Tanadak, and Buldir)	2471	7671	+210%

Table 2. Species and age distribution of cormorants in the Rat Islands in 2004.

Island	RFCO ^a (ad)	RFCO (im)	PECO (ad)	PECO (im)	% RFCO
Semisopochnoi	2126	434 (0.17) ^b	132	75 (0.36)	0.93
Little Sitkin	161	6 (0.04)	139	36 (0.21)	0.49
Kiska	819	342 (0.29)	689	314 (0.31)	0.54
Little Kiska	44	20 (0.31)	93	89 (0.49)	0.26
Segula	31	20 (0.06)	93	29 (0.24)	0.21
Davidof	171	4 (0.02)	65	8 (0.11)	0.71
Khvostof/Pyramid	87	27 (0.24)	62	2 (0.03)	0.64
Rat	165	303 (0.65)	157	129 (0.45)	0.62
Amchitka	116	302 (0.72)	214	424 (0.66)	0.40
Totals	3720	1440(0.28)	1644	1106 (0.40)	0.65

^aRFCO=red-faced cormorant, PECO=pelagic cormorant, UNCO=unidentified cormorant

^b percentage in parentheses

Cormorant Reproductive Success

In spite of fairly large differences in the number of red-faced cormorant nests among islands, average brood size in successful nests was very similar regardless of location (Table 3). The overall average was 2.1 chicks per brood. This might have been a slight underestimate because some nests were classified as having 1+chick and some of these probably had 2 chicks present. Pelagic cormorants had slightly smaller brood sizes than red-faced cormorants, averaging 1.9 chicks per successful nest (Table 3).

It was difficult to calculate nesting success (the proportion of nests that had at least one chick) because 4 of the 7 islands had some nests that could not be assigned to species and most of these were empty nests. Lumping all the red-faced, pelagic, and unknown cormorant nests together, we determined that 572 nests were empty (60%) of the 950 nests for which we determined status. Therefore, only about 40% were still active at the time of our surveys. The number of successful nests probably was slightly higher because we inadvertently failed to record empty nests at Pochnoi Point, Semisopochnoi Island, where one of the largest red-faced cormorant colonies occurred, so we could not use those data in the nesting success calculations. Observers recollect that there were relatively few empty nests there so the overall success rate would have likely been higher if those data were included.

Table 3. Reproductive Success of cormorants in the Rat Islands in 2004.

Productivity of Red-faced Cormorants in the Rat Islands in 2004										
Status	Semi	Segula	Dav-Khov	L. Sitkin	Kiska	L. Kiska	Rat	N. side of Amchitka	Total	Semi. extra ^a
Empty	56	1	92	25	71	6	0	0	251	no data
Present ^b	20	0	9	28	8	0	0	0	65	24
1 chick	0	0	11	9	28	2	0	0	50	89
1+chick	2	0	2	6	10	0	0	0	20	0
2 chick	0	0	95	35	157	4	2	0	293	104
3 chick	3	0	37	22	115	4	0	0	181	24
4 chick	0	0	0	1	6	0	0	0	7	4
5 chick	0	0	0	0	1	0	0	0	1	0
Total Chicks	11	0	314	155	726	22	4	0	1232	385
Total Broods	5	0	145	73	317	10	2	0	552	221
Mean Brood	2.2		2.2	2.1	2.3	2.2	2.0		2.1	1.7

Productivity of Pelagic Cormorants in the Rat Islands in 2004										
Status	Semi	Segula	Dav-Khov	L. Sitkin	Kiska	L. Kiska	Rat	N. side of Amchitka	Total	
Empty	3	11	10	1	39	5	3	1	73	
Present ^b	8	1	2	8	18	1	1	1	40	
1 chick	1	0	6	4	22	3	1	5	42	
1+chick	0	0	0	0	14	0	8	0	22	
2 chick	5	4	26	3	58	16	2	5	119	
3 chick	0	1	5	2	33	9	0	2	52	
4 chick	0	0	0	0	0	0	0	0	0	
5 chick	0	0	0	0	0	0	0	0	0	
Total Chicks	11	11	73	16	251	62	13	21	458	
Total Broods	6	5	37	9	127	28	11	12	235	
Mean Brood	1.8	2.2	2.0	1.8	2.0	2.2	1.2	1.8	1.9	

^aEmpty nests inadvertently not recorded at Pochnoi Point, Semisopochnoi but data useful for average brood size.

^bAdults on active nest but contents not visible

Cormorant Nesting Phenology

Most of the chicks we observed were large and at least a few fledged during our surveys. For example one chick was seen flying from a nest at Amchitka on August 3, and we saw several fledged chicks at Kiska on July 30. Most likely the peak of fledging occurred before mid-August, particularly for red-faced cormorants which seemed to have slightly more advanced chicks than pelagic cormorants.

Counts of Other Species

Approximately 16,000 gulls were counted in the areas we surveyed along with nearly 5,000 common eiders (Table 4). We also saw relatively large numbers of harlequin ducks, black oystercatchers, and pigeon guillemots (Table 4). Tufted and horned puffins also were common in some areas but we did not always count these species since they were not concentrated in nearshore survey areas.

Table 4. Counts of selected species of birds during nearshore boat surveys in the Rat Islands in 2004.

Island	Common Eider	Harlequin Duck	Black Oystercatcher	Glaucous-wing. Gull	Pigeon Guillemot
Little Sitkin	7	9	3	497	129
Kiska	2417	575	103	7156	719
Little Kiska	166	183	25	795	124
Davidof	149	1	3	249	126
Khvostof/Pyramid	56	2	7	366	126
Segula	26	7	2	292	107
Rat	765	447	37	3725	202
Amchitka ^a	1390	635	133	2929	365
Totals	4976	1859	313	16009	1898

^aDoes not include most of the south side (see App. H)

DISCUSSION

Approximately 200% more cormorants (three times the previous counts) were seen in 2004 than in the late 1970s-early 1980s in comparable areas of the Rat Islands (Table 1). Numbers were up on nearly every island surveyed. It was clear that the declines recorded in the Near Island group did not occur in the Rat Islands.

We estimated that there were probably well over 9,000 cormorants in the Rat Islands in summer 2004 based on our counts (8,978 birds) and speculation that the areas we did not count (south side of Amchitka, Tanadak, which had more than 100 birds in the late 1970s, and Buldir) probably held at least several hundred cormorants. Although these numbers represent a substantial increase in cormorants in the Rat Islands, there are not nearly enough birds to

compensate for the large decline recorded in the Near Islands between the late 1970s (64,000 birds) and 2003 (8,000 birds).

As in the Near Islands, there were far more breeding plumage birds than nests in the Rat Islands. We saw 3,720 adult red-faced cormorants but only 1,546 nests. Similarly we saw 1,644 pelagic cormorants and only 397 nests. Large numbers of immature birds, presumably 1 year old birds suggest good productivity in 2003 in the Rat Islands, and although a number of nests had failed by late July, substantial numbers of chicks were near fledging (at least 1,232 red-faced cormorants and 458 pelagic cormorants, Table 3).

Besides cormorants, we noted increases in the following breeding species: common eiders, black oystercatchers, glaucous-winged gulls, and pigeon guillemots (Table 5). Islands where foxes had been removed experienced larger increases than those that never had foxes (Table 5).

Table 5. Comparisons of counts of selected breeding species of birds in the Rat Islands between the late 1970s-early 1980s and 2004.

Species	Fox Islands ^a		No Fox Islands ^b		Total Diff.
	1970s/80s	2004	1970s/80s	2004	
Common Eider	72	3180 (4317%)	39	371 (851%)	3099%
Black Oystercatcher	23	140 (508%)	7	28 (300%)	460%
Glaucous-wing. Gull	2676	11670(336%)	1301	1410 (8%)	229%
Pigeon Guillemot	515	1157 (125%)	322	376 (17%)	83%

^aIslands where introduced foxes were removed following the surveys in the late 1970s and early 1980s including Little Sitkin, Kiska, Segula, and Rat islands. Amchitka is not included in comparisons because we were unable to survey the whole island in 2004.

^bIslands that never had foxes introduced including Little Kiska, Khvostof/Pyramid, and Davidof islands.

LITERATURE CITED

- Byrd, G.V. and J.C. Williams. 2004. Cormorant surveys in the Near Island Group, Aleutian Islands, Alaska, in July 2003 with notes on other species. U.S. Fish and Wildl. Serv. Rep. AMNWR 03/13, Homer, AK.
- Day, R. H., T. J. Early, and E. P. Knudtson. 1978. A bird and mammal survey of the west-central Aleutians, summer 1977. Unnumbered U.S. Fish and Wildl. Serv. Rep., Adak.
- Day, R. H., B. E. Lawhead, T. J. Early, and E. B. Rhode. 1979. Results of marine bird and mammal surveys of the western Aleutian Islands--summer 1978. Unnumbered USFWS Rep., Adak, AK.
- Dragoo, D. E., and F. Deines. 1983. Results of a bird and mammal survey in the west central Aleutians, summer 1982. Unnumbered USFWS Rep., Adak, AK.
- Early, T.J., J. Beall, W. Henry, and A. Taber. 1980. Results of bird and mammal observations in the western Aleutians, summer 1979. Unnumbered USFWS Rep., Adak, AK.

White, C.M., F.S.L. Williamson, and W.B. Emison. 1977. Avifaunal Investigations. Pp 227-260 in *The Environment of Amchitka Island, Alaska* (M.L. Merritt and R.G., Fuller, eds.). Tech. Information Center, Energy Research and Development Administration, Springfield, VA.

APPENDIX A. Surveys for Cormorants and Other Species at Semisopochnoi Island, July 26-28, 2004

During the period July 26-28, 2004 two crews (J.C. Williams, Jeremiah Trimble and Peter Trimble; Vernon Byrd, Ian Jones, Jacques Marias) surveyed the shoreline of Semisopochnoi with inflatable skiffs. On July 26, segments F to A along the east side of the island (Fig. A-1) were surveyed from about 12:30-17:30 h. On July 27, Section A-C was surveyed between 14:00-15:00h, but fog precluded additional surveys. On July 28, we surveyed from point C to point F between 09:30-12:00h.

Cormorant Counts

We counted 2,626 red-faced cormorants, 232 pelagic cormorants, and 16 birds that we could not assign to species for a grand total of 2,874 cormorants on or near cliffs (Table A-1). An additional 325 birds were seen feeding farther offshore (i.e., were not seen on shoreline surveys). Therefore, we estimate that more than 3,000 cormorants were present near Semisopochnoi in late July 2004. It was apparent that red-faced cormorants far outnumbered pelagic cormorants (>10:1). Relatively few nests were counted and we may have underestimated nesting attempts since many of the colonies contained only remnants of nests, apparently following failure (see productivity below). We also saw relatively few subadult (brown) red-faced cormorants (17% of known age birds), but there was a higher proportion of subadult pelagic cormorants (36%). Subadult proportions should be reflective of levels of reproductive success last year.

Cormorant Productivity

Red-faced cormorants had an average of 1.75 chicks per successful nest (i.e., nests with at least 1 chick) (Table A-2). We did not record failed nests in every segment, but in the areas we sampled, approximately 56 nests were empty (70%), and 25 (30%) were still active at the time of our survey. Interestingly, productivity was much better near Pochnoi Point than anywhere else, and although empty nests were not recorded, nesting success was much higher there than elsewhere. In 6 pelagic cormorant nests where we could see chicks, five had 2 chicks and one had a single chick. On 25 empty nests no birds were present so we could not tell species.

Other Species

The only other ledge-nesting species at Semisopochnoi besides cormorants were murrelets. We counted 6,546 near Pochnoi Point (including about 50:50 thick-billed to common murrelets. We also counted 34 common murrelets in several small clusters in caves on the south side of the island. All other species encountered are included in the attached annotated list.

Comparisons

We found more cormorants in 2004 than Day et al. (1978) found in 1977 (Table A-3). Murrelets and pigeon guillemot populations also were higher in 2004. Thomson (1997) counted

cormorants, and murres (among other species) in 1997 in segments I-A and A-B (Fig. A-1). In the two segments he found 517 red-faced cormorants, 62 pelagic cormorants, and 125 unidentified cormorants for a total of 704 cormorants. In this same area, we found 1,475 cormorants in 2004. Our murre count in this area was 6,546 compared to Thomson's peak count of 6,083.

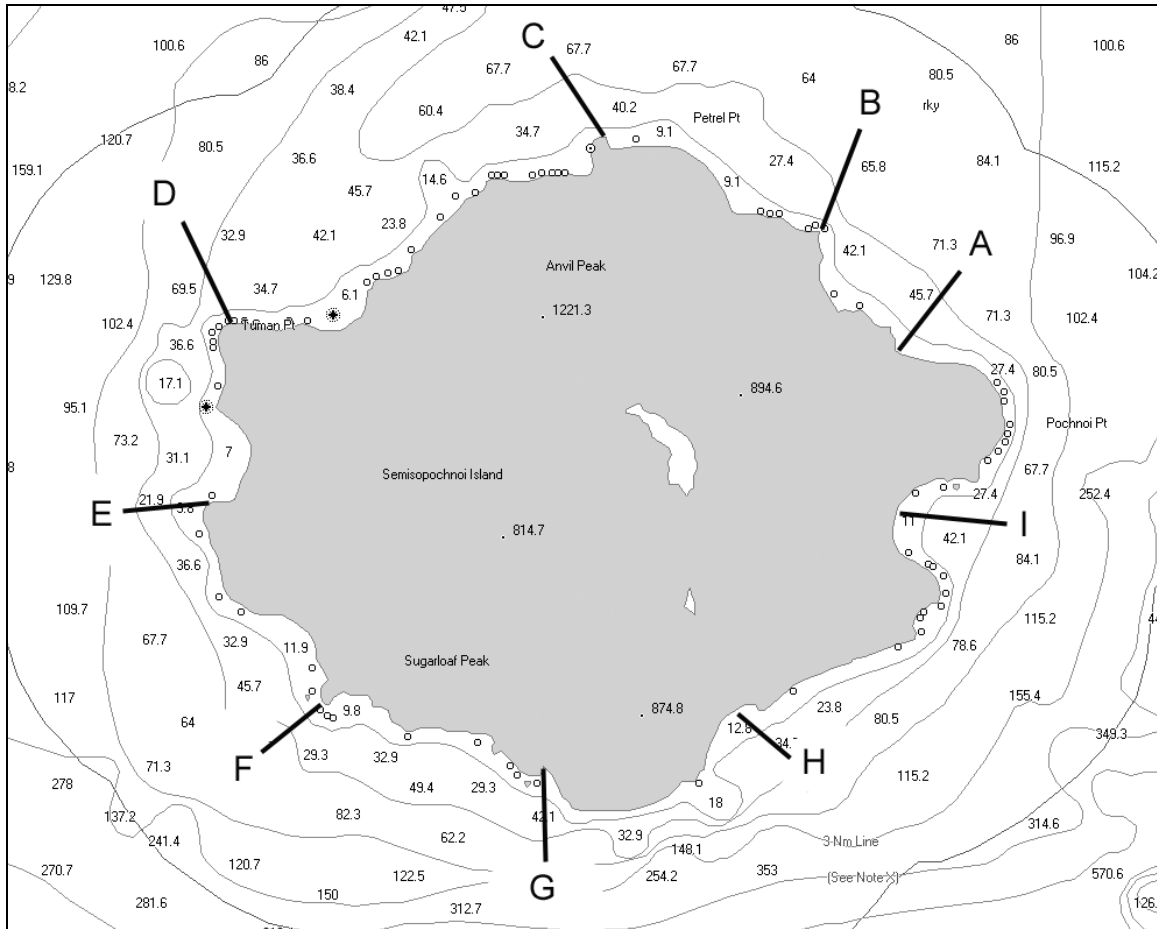


Figure A-1. Chart of Semisopochnoi Island showing segments used in nearshore boat surveys.

Table A-1. Counts of cormorants at Semisopochnoi Island July 26-28, 2004.

Species ^a		F-G	G-H	H-I	I-A	A-B	B-C	C-D	D-E	E-F	Total
RFCO	ad.	145	324	7	892	263	225	204	11	55	2126
	im.	6	40	0	90	150	30	114	2	2	434
	unk	0	0	0	0	0	0	0	0	66	66
	nests	35	16	0	511	2	138	0	0	0	702
sub-total birds		151	364	7	982	413	255	318	13	123	2,626
PECO	ad.	9	23	38	12	0	3	31	13	3	132
	im.	2	8	26	2	0	0	29	1	7	75
	unk	0	0	0	0	25	0	0	0	0	25
	nests		10	0	5	1	0	3	0	0	19
sub-total birds		11	31	64	14	25	3	60	14	10	232
UNCO	ad.	0	0	3	1	0	2	0	0	0	6
	im.	0	0	0	0	0	0	0	0	0	0
	unk	0	0	0	0	0	0	0	10	0	10
	nests	54	109	0	78	0	25	0	0	60	326
sub-total birds		0	0	3	1	0	2	0	10	0	16
Total Corm.		162	395	74	997	438	260	378	37	133	2,874
Corm.in water ^a					200					125	325
Total Nests		89	135	0	594	3	163	3	0	60	987
Total Murres		34	0	0	6,546	0	0	0	0	0	6,580

^aRFCO = red-faced cormorant, PECO = pelagic cormorant, and UNCO = unidentified cormorant

^bbirds counted from Tiglax at seaward edge of extensive kelp beds, well offshore

Table A-2. Productivity of cormorants at Semisopochnoi Island

Status of Nests	Red-faced Cormorant	RFCO Pochnoi	Pelagic Cormorant	Unidentified Cormorant
Empty	56	not recorded	3	25
Present ^a	20	24	8	0
1 chick	0	89	1	0
1+chick	2	0	0	0
2 chick	0	104	5	0
3 chick	3	24	0	0
4 chick	0	4	0	0

^aadults incubating or brooding so that contents of nests not seen

Table A-3. Comparisons of counts of birds at Semisopochnoi Island between 1977 and 2004.

Species	1977 ^a	2004	Difference ^b
Red-faced Cormorant	63	2626	
Pelagic Cormorant	59	232	
Unid. Cormorant	278	16	
Total Cormorant	400	2874	+
Harlequin Duck	50	not recorded	
Com. Eider	0	not recorded	
Bald Eagle total birds	2	not recorded	
Peregrine	2	not recorded	
GW Gull	1173	not recorded	
Murre	1764	6580	+
Black Oystercatcher	5	not recorded	
Pigeon Guillemot	25	50+	+

^a from Day et al. 1978

^b if within 20%

Annotated List of Wildlife Observed at Semisopochnoi Island

Cormorants: Most of the nests on the south side had failed, but not so near Pochnoi Point where birds appeared to be doing well. See text above for details.

Harlequin Duck: 10 were seen in section G-H, and 4-5 were noticed elsewhere.

Common Eider: 1 eclipse male was seen on the south side

Bald Eagle: We noticed two active nests: pair with 2 large young near Sugarloaf Head and a pair with at least 1 young near the boundary or area F.

Peregrine: The species was seen regularly.

Black-legged Kittiwake: Five birds were seen feeding in tide rips off Pochnoi Point.

Glaucous-winged Gull: We counted 130 in section F-G near the beach, including several fledged HY birds. We also counted 248 birds in section G-H, 150 in E-F, and 27 in E-D.

Pigeon Guillemot: At least 30 in sections F-H, 5-10 in sec. H-A. Another 5-10 were seen in area B-D, and we noted only 5 in the area between F and D. Therefore the total was 45-55 that we noticed.

Common Murre: Two chicks were seen on cliffs on south side. Both species of murre were present, approximately 50:50 on Pochnoi Point.

Whiskered Auklet: One adult was seen near area G mark.

Horned puffin: This species was common on the south side.

Sea lions: We did not try to make an accurate count to avoid disturbance; <50 were seen from a distance.

Sea Otter: 5 were seen between sections H and D around the n. side of the island.

Harbor Seal: Two were noticed near area F.

Appendix B. Surveys for Cormorants and Other Species at Little Sitkin Island, July 28, 2004

On July 28, 2004 two crews (J.C. Williams, Jeremiah Trimble and Peter Trimble; Vernon Byrd, Ian Jones, Jacques Marais) surveyed the shoreline of Little Sitkin with inflatable skiffs between 16:00-20:00h. There was patchy fog, but seas were calm and we got a good look at the coastline, usually within 50 m.

Cormorant Counts

We counted 167 red-faced cormorants, 175 pelagic cormorants, and 9 cormorants that we could not identify to species (Table B-1). The grand total was 351 cormorants on or near cliffs (Table B-1). There were 126 red-faced cormorant nests and 54 pelagic cormorant nests. We saw only 6 subadult (brown) red-faced cormorants (4% of known age birds), but there was a higher proportion of subadult pelagic cormorants (21%). Subadult proportions should be reflective of levels of reproductive success last year.

Cormorant Productivity

Approximately 20% of red-faced cormorant nests were empty, leaving 80% that were still active at the time of our survey. Red-faced cormorants had an average of 2.12 chicks per successful nest (i.e., nests with at least 1 chick) (Table B-2). In 18 pelagic cormorant nests where we could determine status, only one was empty. The average brood size in successful nests was 1.8 (from Table B-2).

Other Species

The only other ledge-nesting species at Little Sitkin besides cormorants were murres. We counted approximately 100 birds on two nesting ledges close together. Both species were present, and we saw at least two chicks. Totals for some of the more common species are provided in Table B-3, and all other species encountered are recorded in the annotated list below.

Comparisons

Cormorant numbers and nests had increased substantially since 1982 at Little Sitkin (Table B-4). Furthermore, every species except whiskered auklet had larger or equal numbers in 2004. Whiskered auklet numbers likely are higher too following fox removal because most of the birds we saw were fledglings. Our survey was nearly one month later than the survey in 1982 so they would have been likely to see more adults. New species seen in 2004 were black oystercatcher and Cassin's auklet, both species probably extirpated by foxes and possibly now recovering.

Table 1. Counts of cormorants at Little Sitkin Island July 28, 2004.

Species		A-B ^a	B-C	C-D	D-A	Sitkin Pt. I.	Total
RFCO ^b	ad.	126	18	0	3	14	161
	im.	2	1	0	1	2	6
	nests	126	0	0	0	0	126
sub-total birds		128	19	0	4	16	167
PECO	ad.	46	48	27	16	2	139
	im.	2	19	11	4	0	36
	nests	12	4	38	0	0	54
sub-total birds		48	67	38	20	2	175
UNCO	ad.	0	7	2	0	0	9
	im.	0	0	0	0	0	0
	nests	0	0	1	0	0	1
sub-total birds		0	7	2	0	0	9
Total Corm.		176	93	40	24	18	351
Total Nests		138	4	39	0	0	181
Total Murres		97	0	0	0	0	97

^aSee fig. B-1 for locations of segments

^bRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table B-2. Productivity of cormorants at Little Sitkin Island

Status of Nests	Red-faced Cormorant	Pelagic Cormorant
Empty	25	1
Present ^a	28	8
1 chick	9	4
1+chick	6	0
2 chick	35	3
3 chick	22	2
4 chick	1	0
Total	126	18

^aadults incubating or brooding so that contents of nests not seen

Table B-3. Counts of other species of seabirds at Little Sitkin Island

Segment	Glaucous-winged Gull	Pigeon Guillemot	Whiskered Auklet	Tufted Puffin	Horned Puffin
A-B	230	72	7	138	203
B-C	112	20	14	+ ^a	75
C-D	25	9	0	+	+
D-A	118	27	5	22	24
Island	12	1	1	75	5
Total	497	129	27	253+	307+

^apresent but not counted

Table B-4. Comparisons of counts of birds at Little Sitkin between 1982 and 2004.

Species	1982 ^a	2004	Difference ^b
Red-faced Cormorant	36	167	+
:Pelagic Cormorant	53	175	+
Unid. Cormorant	9	110	+
Total Cormorant	199	351	+
Harlequin Duck	3	9	+
Com. Eider	3	7	+
Bald Eagle total birds	6	7	=
Nests	4	3	=
Peregrine	4	27	+
GW Gull	298	497	+
Unid. Murre	123	112	=
Pigeon Guillemot	99	129	+
Whiskered Auklet	106	27	-
Horned Puffin	132	307	+
Tufted Puffin	80	253	+

^a From Dragoo and Deines 1983

^b= if within 20%

Annotated List of Wildlife observed at Little Sitkin

Cormorants: We counted 351 cormorants and 181 nests. Red-faced cormorant chicks were fairly large, some within a week or so of fledging.

Harlequin Duck: We saw one group of 8 and one single bird.

Common Eider: We noticed a total of 1 male and 6 scattered females, one with a brood of 3 small ducklings.

Bald Eagle: We saw three pairs at or near nests and one immature (2-3 year old). Two of the three nest sites had visible chicks; 2 young in one, one young probably fledged near the other.

Peregrine: We counted 27 different peregrines around the island, many this year's fledglings.

Black Oystercatcher: A total of 3 were seen.

Glaucous-winged Gull: Gulls are nesting on the mainland where foxes could have easily gotten them. We saw at least 10 chicks from the skiff in different places. Jeff saw at least 4 broods; 2, 1,1,1, and two fledglings were seen.

Pigeon Guillemot: Some were carrying small fish, one sculpin, one flatfish, and one small red fish.

Common Murre and thick-billed Murre: At least 2 small chicks were seen. Both species of murre were present. We saw 97 on nesting colonies and about 15 scattered birds in nearshore waters around the rest of the island.

Cassin's Auklet: 2 were seen.

Whiskered Auklet: We noticed at least 27 whiskered auklets near shore. Most were fledglings.

Least Auklet: Two fledglings were seen near shore.

Horned puffin: Lots of birds were seen in vertical cliff crevices and flying to and from cliffs.

Tufted puffin: A colony was noticed south of Pratt Point and one was on the island off Sitkin Point. .

Rosy Finch: At least 10 seen on cliffs.

Winter Wren: Heard frequently from the skiff

Song Sparrow: At least one was seen

Snow Buntings: Saw one on cliffs.

Sea Otter: Jeff Williams saw what appeared to be an injured or sick otter, sitting on a big kelp mat. They got right beside him. In total they saw two. We saw 9 together, but only one additional animal. Total 12.

Harbor Seal: At least 3 were seen.

Appendix C. Surveys for Cormorants and Other Species at Kiska Island, July 29-30, 2004

On July 29, 2004 two crews (J.C. Williams, Jeremiah Trimble and Peter Trimble; Vernon Byrd, Ian Jones, Jacques Marais) surveyed the western shoreline of Kiska with inflatable skiffs between 16:00-20:00h. There was patchy fog, but seas were calm and we got a good look at the coastline, usually within 50 m. Similar conditions on July 30 allowed us to finish the survey between 08:20-22:30 h.

Cormorant Counts

We counted 1,171 red-faced cormorants, 1,003 pelagic cormorants, and 283 cormorants that we could not identify to species on Kiska Islands (Table C-1). The grand total was 2,457 cormorants on or near cliffs (Table C-1). There were 404 red-faced cormorant nests and 193 pelagic cormorant nests. Another 103 nests did not have adults present, so we could not assign them to species. We saw 342 immature red-faced cormorants (29% of known-age birds), and a similar proportion of immature pelagic cormorants (31%). Immature proportions should be reflective of levels of reproductive success last year.

Cormorant Productivity

Approximately 18% of red-faced cormorant nests were empty, leaving 82% that were still active at the time of our survey. In 307 broods sampled, red-faced cormorants had an average of 2.37 chicks per successful nest (i.e., nests with at least 1 chick) (from Table C-2). In pelagic cormorant nests where we could determine status, 39 (21%) were empty. The average brood size in 127 successful nests was 1.98 chicks (from Table C-2).

Other Species

The only other ledge-nesting species at Kiska besides cormorants were black-legged kittiwakes. We counted approximately 1,054 birds and 394 nests in their colony near Wolf Point (Table C-1). The birds apparently suffered very low reproductive success in 2004 because we found only 16 active nests out of 352 checked. Kiska seemed to provide good habitat for common eiders. We counted 626 males and 1,756 females. Although they were difficult to see, we noticed 36 creches of ducklings and probably failed to see a number of others that were present. Most flocks of eiders were composed entirely of one sex. It appeared many of the males were flightless. Gull numbers are definitely up since foxes were removed. We counted more than 7,000 birds including a substantial proportion of immatures. Other particularly common species were pigeon guillemot (719) and harlequin duck (575). Interestingly we noted 7 Kittlitz's murrelets and 11 marbled murrelets. The majority was in Gertrude Cove and near Kiska Harbor (Fig. C-1). Totals for some of the more common species are provided in Table C-3, and all other species encountered are recorded in the annotated list below.

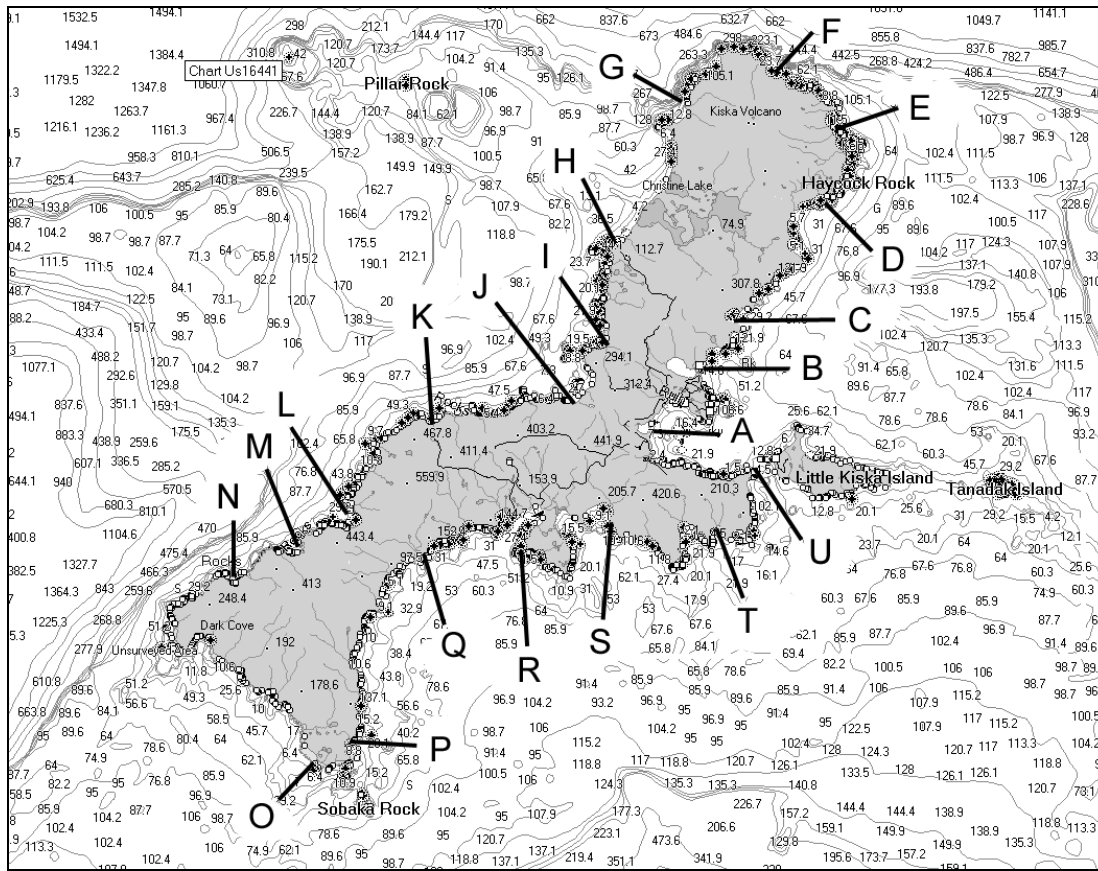


Figure C-1. Chart of Kiska Island showing segments used during nearshore boat surveys.

Comparisons

Cormorant numbers have increased substantially since 1978 at Kiska (Table C-4). We counted nearly 3 times more birds in 2004. Introduced foxes were removed from Kiska in the mid-1980s, so counts in 1979 represent the condition of the avifauna when foxes were present and our counts were made after nearly two decades of recovery for those species not limited by introduced rats that remain on the island. Noticeably more abundant were common eiders, glaucous-winged gulls, black oystercatchers, and pigeon guillemots, all species known to be limited by foxes. Also, we recorded nesting red-breasted mergansers (several broods) another species that foxes would have reduced.

Table C-1. Counts of cormorants and nests at Kiska Island, July 29-30, 2004.																						
Species		A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-K	K-L	L-M	M-N	N-O-P	P-Q	Q-R	R-S	S-T	T-U	U-A	Totals
RFCO ^a	adult	2	4	46	21	156	72	21	16	34	23	293	17	48	19	0	2	18	16	10	1	819
	brown	0	2	20	7	9	51	21	7	15	1	37	68	100	2	0	0	0	1	0	1	342
	unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nests	0	0	0	0	159	77	0	0	4	30	115	0	19	0	0	0	0	0	0	0	404
	sub total	2	6	66	28	165	133	42	23	49	24	330	85	148	21	0	2	18	17	10	2	1171
PECO	adult	7	5	18	19	20	34	28	28	52	53	25	20	94	120	30	27	20	37	42	10	689
	brown	0	4	6	7	2	1	12	26	17	7	7	7	58	89	16	11	9	11	18	6	314
	unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nests	0	0	5	0	7	25	0	0	25	35	8	5	40	23	10	3	3	4	0	0	193
	sub total	7	9	24	26	22	35	40	54	69	60	32	27	152	209	46	38	29	48	60	16	1003
UNCO	adult	0	0	0	0	23	0	0	0	0	0	0	0	0	99	12	0	0	0	0	0	134
	brown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	unknown	1	2	33	0	0	3	10	0	1	6	36	20	20	0	0	2	4	0	11	0	149
	nests	0	0	2	0	0	19	4	4	6	0	62	3	0	0	0	0	0	0	3	0	103
	sub total	1	2	33	0	23	3	10	0	1	6	36	20	20	99	12	2	4	0	11	0	283
Totals	birds																					2,457
	nests																					700

^aRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table C-2. Productivity of cormorants and kittiwakes at Kiska Island

Status of Nests	Red-faced Cormorant	Pelagic Cormorant	Unknown Cormorant	Black-legged Kittiwake
Empty	71	39	71	336
Present ^a	8	18	0	11
1 chick	28	22	6	5
1+chick	10	14	0	
2 chick	157	58	1	
3 chick	115	33	0	
4 chick	6	0	0	
5 chick	1	0	0	
Total	386	184	78	352

^a adults incubating or brooding so that contents of nests not seen

Table C-3. Counts of birds other than cormorants and kittiwakes at Kiska Island on July 29-30, 2004.																					
Species	A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-K	K-L	L-M	M-N	N-O-P	P-Q	Q-R	R-S	S-T	T-U	U-A	Totals
GWGU	69	12	96	23	220	535	295	225	77	136	269	110	528	3729	73	128	160	298	161	12	7156
PIGU	52	22	40	28	14	11	18	14	20	66	33	22	19	45	83	88	58	28	20	38	719
COEI male	1	0	102	0	0	0	0	3	0	2	1			1	400	108	0	0	1	7	626
female	69	41	71	18	29	4	4	42	23	35	63	19	25	232	690	123	23	27	63	155	1756
creches	10	3	1	1	0	0	0	1	2	3	3	0	0	3	1	2	0	2	1	3	36
total	70	41	173	18	29	4	4	45	23	37	64	19	25	233	1090	231	23	27	64	162	2382
HADU	44	81	71	0	0	0	3	11	3	13	2	0	0	24	53	68	52	39	0	111	575
RBME	1	11	0	0	0	0	0	0	5	0	0	0	0	5	6	3	2	0	0	4	37
BLOY	0	2	13	4	0	1		7	6	4	2	2	6	18	2	5	5	19	3	4	103
BAEA adult	3	3	4	2	2	7	0	4	5	2	2	3	0	10	7	2	3	4	5	1	69
juv	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	7
chicks	1	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2	2	3	13
total	0	0	0	0	0	0	0	4	5	2	2	0	0	0	0	2	4	7	0	0	82
PEFA	2	2	1	1	0	12	5	3	1	1	1	0	0	0	1	1	2	1	2	0	36
KIMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	0	0	0	7
MAMU	0	1	0	0	0	0	0	0	0	0	0	0	0	2	4	4	0		0	0	11

Table C-4. Comparisons of counts of birds at Kiska between 1982 and 2004.

Species	1978 ^a	2004	Difference ^b
Red-faced Cormorant	94	1171	
Pelagic Cormorant	26	1003	
Unid. Cormorant	793	283	
Total Cormorant	913	2753	+
Harlequin Duck	50	573	+
Com. Eider	19	2382	+
Red-breasted Merganser	0	37	+
Bald Eagle total birds	56	76	+
Peregrine	16	36	
GW Gull	1249	7156	+
Black-leg Kittiwake (nests)	(390)	1054 (394)	= (nests)
Black Oystercatcher	22	103	+
Pigeon Guillemot	315	719	+

^a From Day et al. 1979

^b= if within 20%

Annotated List of Wildlife Observed at Kiska Island

Red-throated Loon: One flew over near Salmon Lagoon.

Cormorants: More than 1,000 each of red-faced and pelagic cormorants were counted on Kiska. Most chicks in nests were fairly large, particular those of red-faced cormorant.

Harlequin Duck: More than 500 harlequins were noted, scatter in the nearshore zone.

Common Eider: Flocks were either almost all male or almost all female. It seemed the males were mostly still flightless.

Red-breasted Merganser: We saw at least 6 broods of ducklings ranging from 3 to 11.

Bald Eagle: Most young were flying

Peregrine: Lots of fledglings were seen.

Black Oystercatcher: Several fledglings were seen.

Parasitic Jaeger: 3 individuals were seen.

Black-legged Kittiwake: Only 2-3 were seen away from the breeding colony.

Glaucous-winged Gull: Lots of 1 and 2 year olds as well as some fledglings were seen. Gulls are nesting in places where foxes could easily have gotten them.

Pigeon Guillemot: We noted more than 700 guillemots.

Common Murre and Thick-billed Murre: Scattered single murrets of both species, but more frequently common murrets were seen feeding in kelp forests.

Marbled Murrelet: A total of 11 were seen.

Kittlitz's Murrelet: We identified 7 birds.

Ancient Murrelet: Seven scattered birds were counted.

Whiskered Auklet: Several fledglings were seen.

Horned puffin: Scattered in low numbers.

Tufted puffin: Not very common.

Rosy Finch: Fairly commonly seen.

Winter Wren: Heard very commonly

Snow Buntings: Noted periodically during the survey on coastal bluffs.

Sea lions: No attempt was made to get an accurate count.

Sea Otter: 55 were counted, at least a few with small pups.

Harbor Seal: We noted 116, several with pups.

Appendix D. Surveys for Cormorants and Other Species at Little Kiska Island, July 30, 2004

On July 30, 2004 J.C. Williams, Jeremiah Trimble and Peter Trimble surveyed the coastline of Little Kiska with an inflatable skiff 14:00-15:30 h. There was patchy fog, but seas were calm and we got a good look at the coastline, usually within 50 m.

Cormorant Counts

We counted 64 red-faced cormorants, and 182 pelagic cormorants on Little Kiska Island (Table D-1). The grand total was 246 cormorants on or near cliffs (Table D-1). There were 16 red-faced cormorant nests, 35 pelagic cormorant nests and 3 nests with no birds present so we could not assign them to species. We saw 20 immature (brown) red-faced cormorants (31% of known-age birds), and 89 brown pelagic cormorants (49% of the total birds seen). Immature proportions should be reflective of levels of reproductive success last year.

Cormorant Productivity

Approximately 38% of red-faced cormorant nests were empty, leaving 62% that were still active at the time of our survey. In 10 broods sampled, red-faced cormorants had an average of 2.2 chicks per successful nest (i.e., nests with at least 1 chick) (from Table D-2). In 33 pelagic cormorant nests where we could determine status, (15%) were empty. The average brood size in 28 successful nests was 2.21 chicks (from Table D-2).

Other Species

Little Kiska had nearly 800 glaucous-winged gulls near the coastline. The next most commonly seen species were common eider, harlequin duck, and pigeon guillemot (Table D-3). Information on other species encountered is recorded in the annotated list below.

Comparisons

Cormorant numbers have increased substantially since 1978 at Little Kiska (Table D-4). We counted nearly 3 times more birds in 2004. Numbers were up in 2004 for most comparable species.

Table D-1. Counts of cormorants at Little Kiska Island on July 30, 2004.

Species		A-B	B-C	C-A	Total
RFCO ^a	adult	27	0	17	44
	brown	10	0	10	20
	unknown	0	0	0	0
	nests	16	0	0	16
	sub total	37	0	27	64
PECO	adult	36	22	35	93
	brown	5	19	65	89
	unknown	0	0	0	0
	nests	30	0	5	35
	sub total	41	41	100	182
UNCO	adult	1	0	0	1
	brown	2	0	0	2
	unknown	0	0	0	0
	nests	2	0	1	3
	sub total	3	0	0	3
Totals	birds				249
	nests				54

^aRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table D-2. Productivity of cormorants at Little Kiska Island

Status of Nests	Red-faced Cormorant	Pelagic Cormorant
Empty	6	5
Present ^a	0	1
1 chick	2	3
1+chick	0	0
2 chick	4	16
3 chick	4	9
Total	16	34

^aadults incubating or brooding so that contents of nests not seen

Table D-3. Observations of wildlife other than cormorants at Little Kiska Island on July 30, 2004.

Species	A-B ^a	B-C	C-D	Total
Glaucous-winged Gull	255	210	330	795
Pigeon Guillemot	38	15	71	124
Common Eider male	3	0	1	4
female	134	0	28	162
crèches	2	0	1	3
total	137	0	29	166
Harlequin Duck	162	9	21	183
Black Oystercatcher	8	5	12	25
Bald Eagle ad	3	3	2	8
Im	2	0	0	2
Total	5	3	2	10
Peregrine Falcon	2	0	3	5
Harbor Seal	3	0	0	3

^aSee Fig. D-1 for segment locations.

Table D-4. Comparisons of counts of birds at Little Kiska between 1978 and 2004.

Species	1978 ^a	2004	Difference ^b
Red-faced Cormorant	5	64	
:Pelagic Cormorant	9	182	
Unid. Cormorant	165	0	
Total Cormorant	179	249	+
Harlequin Duck	32	183	+
Com. Eider	37	166	+
Bald Eagle total birds	3	8a,2im	+
Peregrine	5	5	=
GW Gull	609	795	+
Black Oystercatcher	7	25	+
Pigeon Guillemot	186	124	-

^aFrom Day et al. 1979

^b= if within 20%

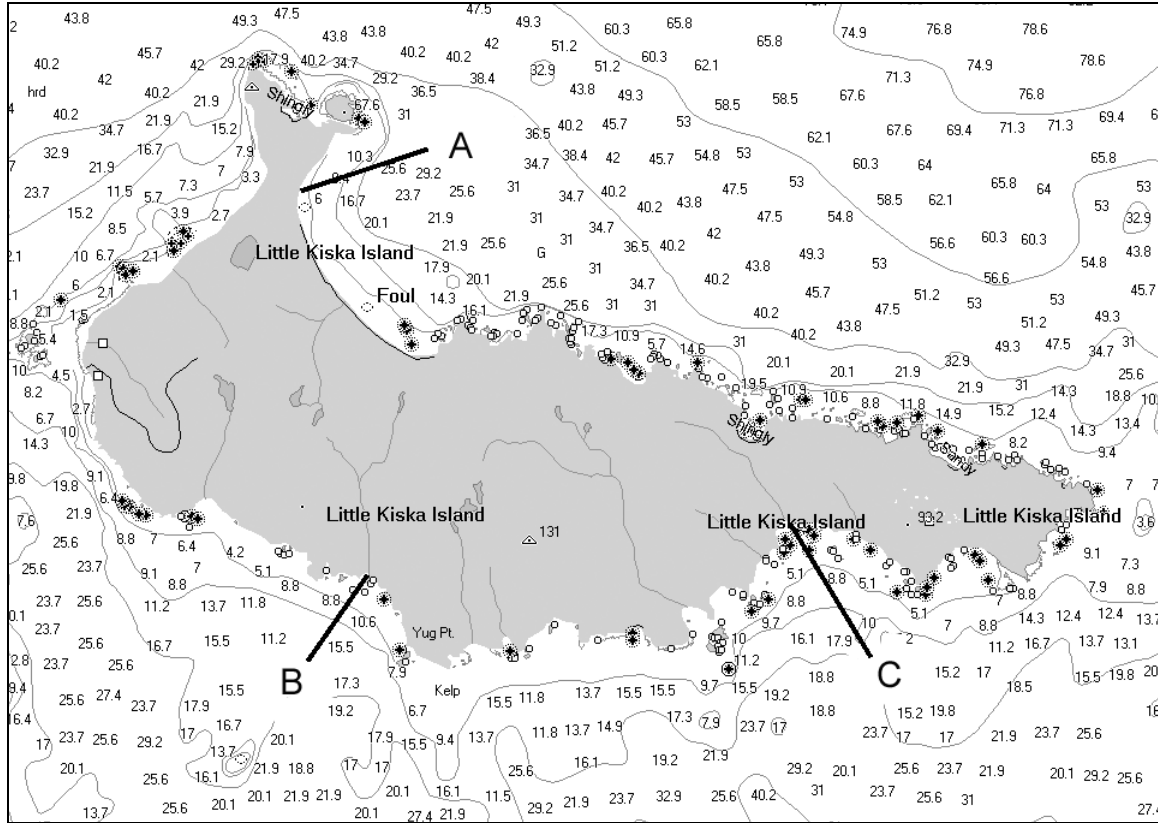


Figure D-1. Chart of Little Kiska Island showing segments used in nearshore boat surveys.

Annotated List of Wildlife Observed at Little Kiska Island

Cormorants: About 250 birds were counted at Little Kiska. We also saw about 50 nests.

Harlequin Duck: About 180 harlequins were noted, scattered in the nearshore zone.

Common Eider: Almost all the eiders seen were females and we noted a few ducklings.

Bald Eagle: The species was fairly common.

Peregrine Falcon: We saw 5 birds including fledgling.

Black Oystercatcher: This species was particularly common. At least one fledglings was seen.

Parasitic Jaeger: 2 individuals were seen.

Glaucous-winged Gull: Gulls were very common, including fledglings.
Pigeon Guillemot: We noted more than 700 guillemots.

Pigeon Guillemot: More than 100 were seen.

Horned puffin: Very common near Little Kiska.

Tufted puffin: Common near the island.

Winter Wren: Heard very commonly

Harbor Seal: We noted 3.

Appendix E. Surveys for Cormorants and Other Species at Davidof, Khvostof, and Pyramid Island, August 1, 2004

On August 1, 2004 two crews (J.C. Williams, Jerimiah Trimble and Peter Trimble; Vernon Byrd, Ian Jones, Jacques Marias) surveyed the shorelines of Davidof, Khvostof, and Pyramid Islands with inflatable skiffs between 11:00-16:00h. Visibility was good. There was a 15 kt. nw wind causing slight chop. We got a good look at the coastline, usually within 50 m, but kelp made it difficult to get that close on some areas.

Cormorant Counts

We counted 288 red-faced cormorants, 144 pelagic cormorants, and 26 cormorants that we could not identify to species (Table E-1). The grand total was 458 cormorants on or near cliffs (Table E-1). There were 289 red-faced cormorant nests and 50 pelagic cormorant nests and 123 nests with no adult nearby. We saw 31 subadult (brown) red-faced cormorants (10% of known age birds). About 7% of the pelagic cormorants were brown birds. Subadult proportions should be reflective of levels of reproductive success last year.

Cormorant Productivity

Approximately 37% of red-faced cormorant nests were empty, leaving 63% that were still active at the time of our survey. Red-faced cormorants had an average of 2.17 chicks per successful nest (i.e., nests with at least 1 chick) (Table E-2). In 49 pelagic cormorant nests where we could determine status, 10 (20%) were empty. The average brood size in successful nests was 1.97 (from Table E-2).

Other Species

Totals for some of the more common species are provided in Table E-3, and all other species encountered are recorded in the annotated list below.

Comparisons

We found more cormorants at Khvostof and Pyramid and about the same number at Davidof in 2004 as 1979 (Early et al. 1980). Other species with higher numbers in 2004 on all islands were common eider, bald eagle and pigeon guillemot (Tables E-5 and E-6). Davidof had more murrelets and northern fulmars in 2004 (Table E-6). We counted fewer puffins in 2004 than were seen in 1979, but puffins are notorious for being highly variable near colonies, so this does not necessarily suggest reduced populations. Figure F-1 shows the segments used in the surveys.

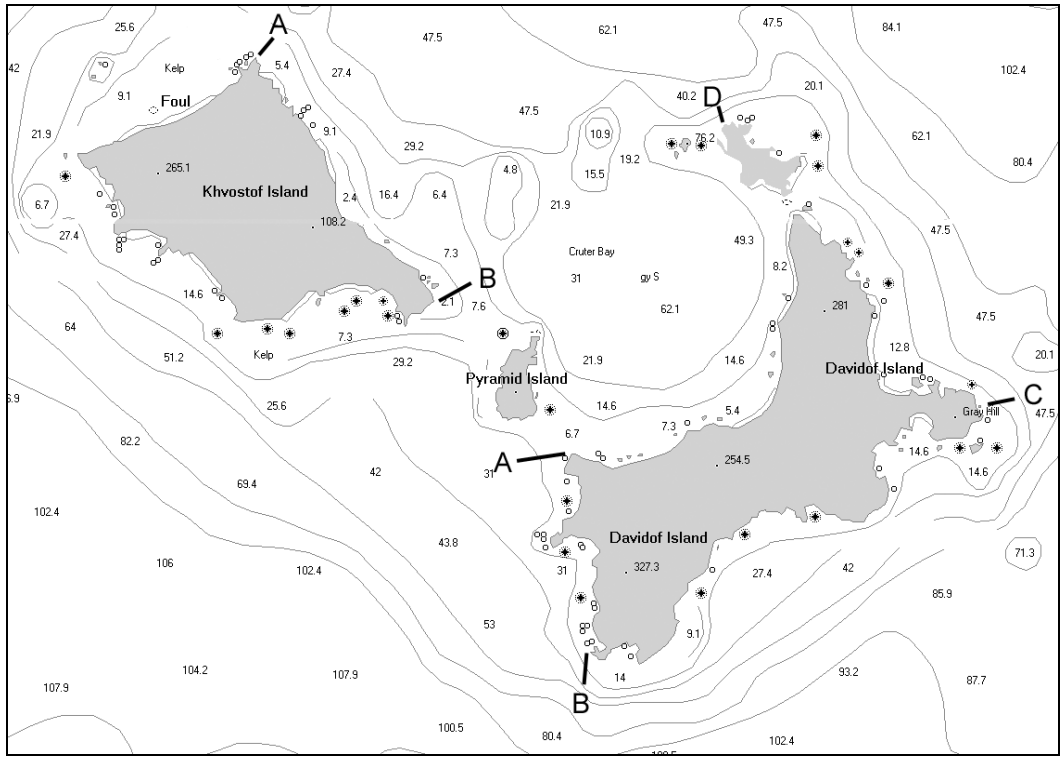


Figure E-1. Chart of Khvostof, Pyramid, and Davidof Islands showing segments used in nearshore boat survey.

Table E-1. Counts of cormorants at Khvostof Island, Pyramid, and Davidof islands on August 1, 2004.

		Khvostof			Davidof				
Species		A-B ^a	B-A	Pyramid	A-B	B-C	C-D	D-A	Total
RFCO ^b	ad.	0	84	3	159	5	6	0	257
	im.	0	27	0	2	0	1	1	31
	nests	0	81	0	208	7	0	0	289
sub-total birds		0	111	3	161	5	7	1	288
PECO	ad.	7	61	1	20	14	25	6	134
	im.	0	0	2	0	4	0	4	10
	nests	0	32	0	17	1	0	0	50
sub-total birds		7	61	3	20	18	25	10	144
UNCO	ad.	7	14	0	1	0	4	0	26
	im.	0	0	0	0	0	0	0	0
	nests	0	3	0	104	16	0	0	123
sub-total birds		7	14	0	1	0	4	0	26
Total Corm.		14	186	6	182	23	36	11	458
Total Nests		0	116	0	329	24	0	0	469
Total Murres		60			171	1472			1703

^aSee Fig. E-1 for segment locations.

^bRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table E-2. Productivity of cormorants at Khvostof, Davidof, and Pyramid Islands

Status of Nests	Red-faced Cormorant	Pelagic Cormorant	Unidentified Cormorant
Empty	92	10	108
Present ^a	9	2	0
1 chick	11	6	3
1+chick	2	0	4
2 chick	95	26	7
3 chick	37	5	1
Total	246	49	123

^aadults incubating or brooding so that contents of nests not seen

Table E-3. Counts of other species of seabirds at Khvostof and Pyramid Islands

Segment	GWGU ^a	PIGU	BLOY	TUPU	HOPU	COEI	HADU	BAEA	PEFA
A-B	83	19	5	57	75	0	0	0	4
B-A (w)	255	71	2	480	263	34	1	6	3
Pyramid	28	36	0	44	30	22	1	0	2
Total	366	126	7	581	368	56	2	6	9

^aGWGU = glaucous-winged gull, PIGU = pigeon guillemot, BLOY = black oystercatcher, TUPU = tufted puffin, HOPU = horned puffin, COEI = common eider, HADU = harlequin duck, BAEA = bald eagle, PEFA = peregrine falcon

Table E-4. Counts of other species of seabirds at Davidof Island

Segment	GWGU ^a	PIGU	BLOY	TUPU	HOPU	COEI	HADU	BAEA	PEFA	NOFU
A-B	10	24	0	128	51	16	0	0	0	
B-C	42	47	0	96	32	27	1	3	5	150 ^b
C-D	120	30	3	260	65	43	0	1	1	
D-A	77	25	0	44	51	31	0	1	0	
Total	249	126	3	528	199	149	1	5	6	150

^aGWGU = glaucous-winged gull, PIGU = pigeon guillemot, BLOY = black oystercatcher, TUPU = tufted puffin, HOPU = horned puffin, COEI = common eider, HADU = harlequin duck, BAEA = bald eagle, PEFA = peregrine falcon, NOFU = northern fulmar

^bGPS location: 60U0592327, UTM5756780

Table E-5. Comparisons of counts of birds at Khvostof and Pyramid between 1979 and 2004.

Species	1979 ^a	2004	Difference ^b
Red-faced Cormorant		114	
Pelagic Cormorant		71	
Unid. Cormorant	132	21	
Total Cormorant	132	206	+
Harlequin Duck	5	2	-
Com. Eider	0	56	+
Bald Eagle total birds	0	6	+
Peregrine	6	9	+
GW Gull	343	366	=
Unid. Murre	35	60	+
Pigeon Guillemot	47	126	+
Horned Puffin	900	368	-
Tufted Puffin	1287	581	-

^aFrom Early et al. 1980

^b= if within 10%

Table E-6. Comparisons of counts of birds at Davidof between 1979 and 2004.

Species	1979 ^a	2004	Difference ^b
Red-faced Cormorant	15	174	
Pelagic Cormorant	5	73	
Unid. Cormorant	200	5	
Total Cormorant	220	252	=
Harlequin Duck	0	1	=
Com. Eider	2	149	+
Black Oystercatcher	0	3	+
Bald Eagle total birds	1	5	+
Peregrine	4	6	+
GW Gull	349	249	-
Unid. Murre	413	1643	+
Pigeon Guillemot	89	126	+
Northern Fulmar	60	150	+
Horned Puffin	2312	528	-
Tufted Puffin	1405	199	-

^aFrom Early et al. 1980

^b= if within 20%

Annotated List of Wildlife Observed at Davidof, Khvostof, and Pyramid Islands.

Northern Fulmar: A nesting colony was seen on the south side of Davidof. We saw at least 150 birds on nest scrapes or flying over the slopes. They were hard to count because of the lush vegetation, and very likely our count is an underestimate of the number of birds present. Most of the individuals were of the dark color phase.

Cormorants: Red-faced cormorants outnumbered pelagics 2:1. Most of the cormorants were in a single area on the west side of Davidof.

Harlequin Duck: We saw only 3 birds in the group.

Common Eider: More than 200 eiders were counted in the island group. Most were in female plumage. We saw at least 4 creches of ducklings.

Bald Eagle: Eleven adults were noted.

Peregrine: We counted 15 different peregrines around the islands, many fledglings.

Black Oystercatcher: A total of 10 were seen.

Glaucous-winged Gull: More than 600 gulls were counted.

Pigeon Guillemot: About 250 guillemots were counted. Many were carrying small fish; sculpins and a small red fish.

Common Murre and Thick-billed Murre: Both species were present in breeding colonies on the south and west sides of Davidof.

Horned puffin: This species outnumbered tufted puffin around Davidof, but on Khvostof and Pyramid the opposite was true.

Tufted puffin: Common, probably nesting on all three island.

Rosy Finch: Seen occasionally on cliffs.

Winter Wren: Heard frequently from the skiff

Snow Buntings: Saw several on cliffs.

Sea Otter: 5 were noted.

Harbor Seal: At least 6 were seen.

Appendix F. Surveys for Cormorants and Other Wildlife at Segula Island, August 1, 2004

On August 1, 2004 two crews (J.C. Williams, Jerimiah Trimble and Peter Trimble; Vernon Byrd, Ian Jones, Jacques Marias) surveyed the shoreline of Segula with inflatable skiffs between 09:00-10:30 h. Visibility was good. There was a 15 kt. nw wind causing slight chop. We got a good look at the coastline, usually within 50 m.

Cormorant Counts

We counted 37 red-faced cormorants, 122 pelagic cormorants, and 24 cormorants that we could not identify to species (Table F-1). The grand total was 183 cormorants on or near cliffs (Table F-1). There was only 1 red-faced cormorant nest and 17 pelagic cormorant nests. All the red-faced cormorants we saw were adults, but 24% of pelagic cormorants were subadult, brown-plumaged birds.

Cormorant Productivity

The only red-faced cormorant nest we saw was empty. Eleven of the 17 pelagic cormorant nests were empty, one had a bird present, four had two chicks, and one had three chicks.

Other Species

Totals for some of the more common species are provided in Table F-2, and all other species encountered are recorded in the annotated list below.

Comparisons

Fewer cormorants were counted at Segula in 2004 than had been noted there previously (Table F-3). Also fewer harlequin ducks and puffins were noted, but numbers of other species were higher.

Table F-1. Counts of cormorants at Segula on August 1, 2004.

Species		A-B ^a	B-C	C-D	D-E	E-F	F-A	Total
RFCO ^b	ad.	4	7	3	13	7	1	31
	im.	1	0	1	0	0	0	2
	nests	0	0	1	0	0	0	1
sub-total birds		5	7	4	13	7	1	37
PECO	ad.	16	26	9	19	4	19	93
	im.	6	6	7	6	2	2	29
	nests	2	15	0	0	0	0	17
sub-total birds		22	32	16	25	6	21	122
UNCO	ad.	7	1	7	6	3	0	24
	im.	0	0	0	0	0	0	0
	nests	0	0	0	0	0	0	0
sub-total birds		7	1	7	6	3	0	24
Total Corm.		34	42	27	43	16	22	183
Total Nests		2	15	1	0	0	0	18

^aSee Fig. F-1 for segment locations.

^bRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

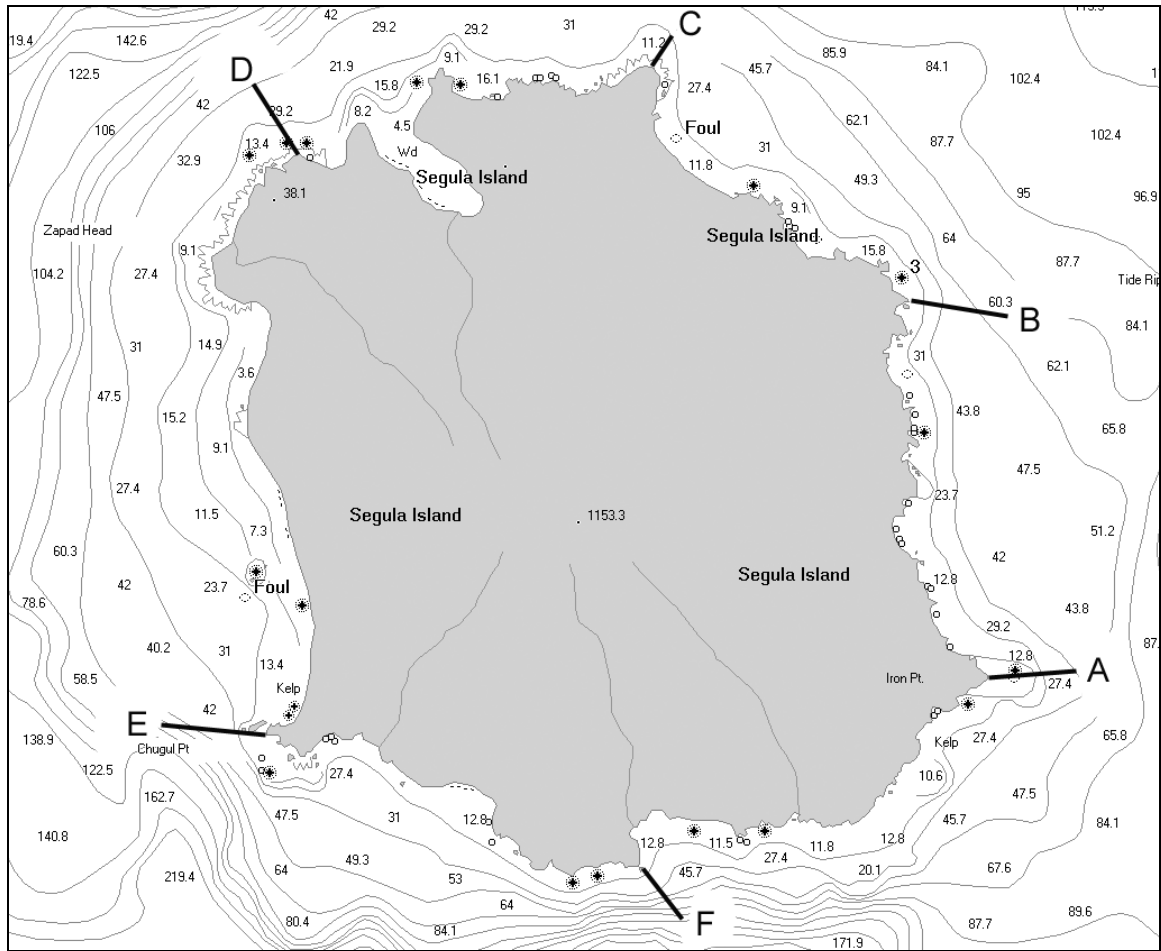


Figure F-1. Chart of Segula Island showing segments used in nearshore boat surveys.

Table F-2. Counts of other species of birds at Segula Island.

Segment ^a	GWGU ^b	PIGU	BLOY	TUPU	HOPU	HADU	COEI	BAEA	PEFA
A-B	42	6	0	2	12	0	0	2a	5
B-C	39	8	0	4	12	0	0	2a,4i	6
C-D	125	15	2	2	6	5	0	4a	7
D-E	13	32	2	0	3	1	1	1a,1i	3
E-F	25	33	0	0	8	1	24	1	7
F-A	48	13	0	9	22	0	1	0	3
Total	292	107	2	17	63	7	26	10a2i	31

^aSee Fig. F-1 for locations of segments

^bGWGU = glaucous-winged gull, PIGU = pigeon guillemot, BLOY = black oystercatcher, TUPU = tufted puffin, HOPU = horned puffin, COEI = common eider, HADU = harlequin duck, BAEA = bald eagle, PEFA = peregrine falcon

Table F-3. Comparisons of counts of birds at Segula between 1979 and 2004.

Species	1979 ^a	2004	Difference ^a
Red-faced Cormorant		37	
:Pelagic Cormorant		122	
Unid. Cormorant	258	84	
Total Cormorant	258	183	-
Harlequin Duck	34	7	-
Com. Eider	0	26	+
Bald Eagle total birds	5a3im	10a 2 im	+
Peregrine	10	31	+
GW Gull	229	292	+
Pigeon Guillemot	76	107	+
Horned Puffin	110	63	-
Tufted Puffin	110	17	-

^aFrom Early et al. 1980

^b= if within 20%

Annotated List of Wildlife Seen at Segula Island, August 1, 2004

Cormorants: We counted 183 cormorants. Most were pelagics. Very few nests were found at Segula.

Harlequin Duck: Only 7 were noticed during the survey.

Common Eider: We saw 26 birds, most in single flocks of 12 males and 12 females.

Bald Eagle: A total of 10 adults and 2 immatures were noted.

Peregrine: We counted 31 different peregrines around the island, many this year's fledglings.

Black Oystercatcher: A total of 2 were seen.

Glaucous-winged Gull: Of the 292 gulls counted, many were subadult birds.

Pigeon Guillemot: More than 100 were counted, less on the eastern side of the island than elsewhere.

Least Auklet: Only a few were seen flying from the overgrown talus near Gula Point. Two fledglings were seen near shore.

Ancient Murrelet: One was noted.

Horned puffin: This species was more common than tufted puffin on this rocky island.

Tufted puffin: Less than 20 were seen.

Rosy Finch: At least 20 seen on cliffs.

Winter Wren: Heard frequently from the skiff

Song Sparrow: At least 3 were seen

Sea Otter: 6 were counted.

Appendix G. Surveys for Cormorants and Other Birds at Rat Island, August 2, 2004

On August 1-2, 2004 J.C. Williams, Jeremiah Trimble and Peter Trimble in one crew and G.V. Byrd, Ian Jones, and Andrew Ritche in a second crew surveyed the coastline of Little Kiska with inflatable skiffs. A portion of the south side was surveyed on Aug. 1 in the evening, but fog stopped the survey. Fog did not clear on August 2 until about 16:00 h. We were able to complete the survey between 16:00-20:30 h. The extensive kelp beds, particularly on the south side, made it difficult to get close to shore. Some surveys were up to 100 m from shore, but most of the time we were able to work our way in to 50-75 m from the beach. There was patchy fog, but seas were calm and we got a good look at the coastline.

Cormorant Counts

We counted 468 red-faced cormorants, and 298 pelagic cormorants on Rat Island (Table G-1). We could not assign another 47 birds to species. The grand total was 813 cormorants on or near cliffs (Table G-1). Interestingly, there were only 16 nests, 1 red-faced cormorant nest and 15 pelagic cormorant nests. That was a preponderance of immature red-faced cormorants; 65% of the total. Likewise nearly half the pelagic cormorants we observed were in immature (brown) plumage.

Cormorant Productivity

The only red-faced cormorant nest had 3 chicks. Of 15 pelagic cormorant nests, 3 (20%) were empty (Table G-2). Because it was difficult to get close due to the kelp, we could not determine brood sizes accurately for the majority of nests.

Other Species

Rat Island had more than 3,700 glaucous-winged gulls near the coastline. The next most commonly seen species were common eider, harlequin duck, and pigeon guillemot (Table G-3). Information on other species encountered is recorded in the annotated list below.

Comparisons

Cormorant numbers have increased more than 300% since 1982 at Rat Island (Table G-4). Nevertheless, there were few nests and a relatively high percentage of the birds were immatures. Introduced foxes were removed from Rat Island in the mid-1980s. Common eiders, glaucous-winged gulls, black oystercatchers, and pigeon guillemots, all species known to be limited by foxes were noticeably more abundant in 2004 than when foxes were present.

Table G-1. Numbers of cormorants counted at Rat Island on August 1-2, 2004.

Species		A-B ^a	B-C	C-D	D-E	E-F	F-A	Total
RFCO ^b	adult	4	0	2	76	68	15	165
	brown	0	0	1	243	59	0	303
	unknown	0	0	0	0	0	0	0
	nests	0	0	0	1	0	0	1
	sub total	4	0	3	319	127	15	468
PECO	adult	30	5	12	35	63	12	157
	brown	24	19	14	25	28	19	129
	unknown	1	1	0	0	0	10	12
	nests	0	0	0	15	0	0	15
	sub total	55	25	26	60	91	41	298
UNCO	adult	0	0	2	5	10	1	18
	brown	0	0	0	0	0	0	0
	unknown	19	5	3	0	0	2	19
	nests	0	0	0	0	0	0	0
	sub total	19	5	5	5	10	3	47
Totals	birds	78	30	34	384	228	59	813
	nests	0	0	0	16	0	0	16

^aSee Fig. G-1 for locations of segments

^bRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table G-2. Productivity of cormorants at Rat Island in 2004.

Status of Nests	Red-faced Cormorant	Pelagic Cormorant
Empty	0	3
Present ^a	0	1
1 chick	0	1
1+chick	0	8
2 chick	0	2
3 chick	1	
Total	1	15

^aadults incubating or brooding so that contents of nests not seen

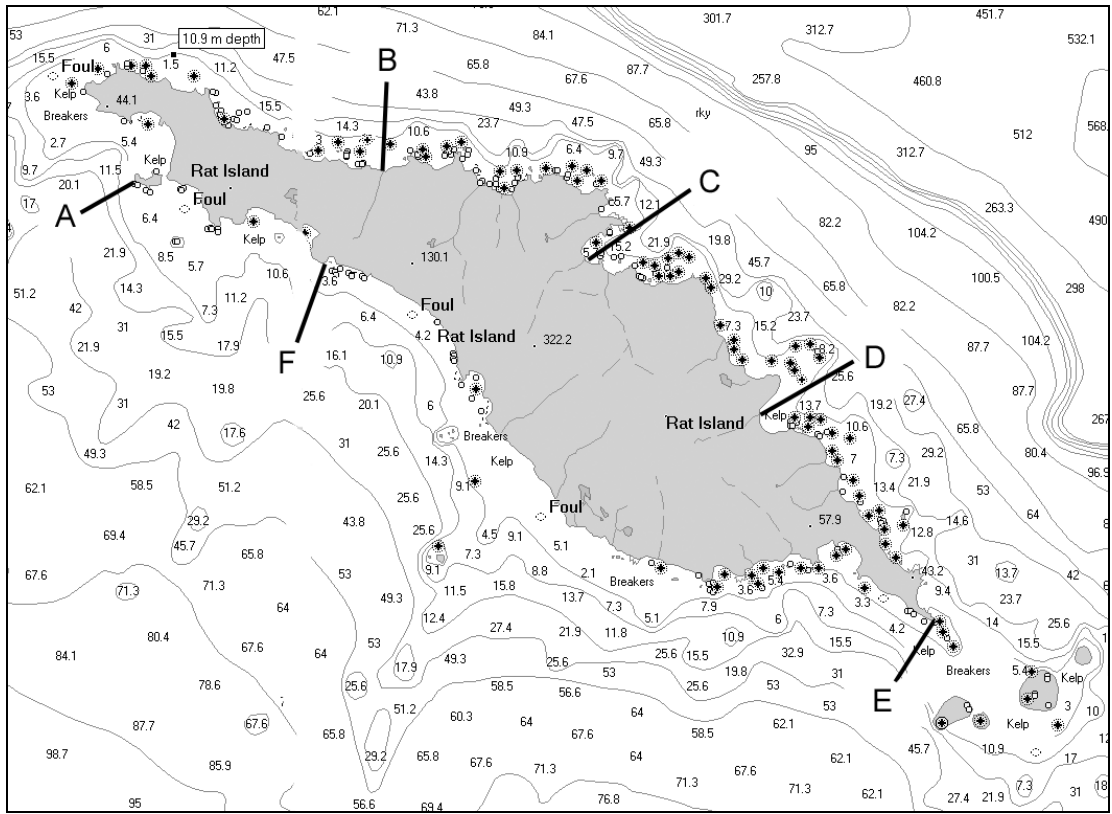


Figure G-1. Chart of Rat Island showing segments used in nearshore boat surveys.

Table G-3. Counts of wildlife other than cormorants at Rat Island, August 1-2, 2004.

Seg.	GWGU	PIGU	BLOY	TUPU	HOPU	COEI	HADU	BAEA	PEFA	SEOT	HASE
A-B	1099	63	19	21	12	78	150	6a,15i	1	5	3
B-C	256	48	3	0	15	97	150	4a,2i	3	0	13
C-D	62	13	0	0	5	0	53	2a	2a	0	2
D-E	111	44	7	126	68	2	14	4a,1i	1	1	1
E-F	1882	30	8	9	25	586	56	5a	0	4	17
F-A	315	4	0	2	1	2	24	3a	0	0	0
Total	3725	202	37	158	126	765	447	24a,18i	7	10	36

^aGWGU = glaucous-winged gull, PIGU = pigeon guillemot, BLOY = black oystercatcher, TUPU = tufted puffin, HOPU = horned puffin, COEI = common eider, HADU = harlequin duck, BAEA = bald eagle, PEFA = peregrine falcon, SEOT=sea otter, HASE = harbor seal

Table G-4. Comparisons of counts of birds at Rat Island between 1982 and 2004.

Species	1982 ^a	2004	Difference ^b
Red-faced Cormorant	6	474	
:Pelagic Cormorant	7	278	
Unid. Cormorant	157	47	
Total Cormorant	170	793	+
Harlequin Duck	52	447	+
Com. Eider	50	765	+
Bald Eagle total birds	18	42	+
Peregrine	4	7	+
GW Gull	900	3725	+
Black Oystercatcher	1	37	+
Pigeon Guillemot	25	202	+

^aSee Fig. G-1 for locations of segments.

^b“=” if within 20%

Annotated List of wildlife observed at Rat Island in August 2004.

Cormorants: Nearly 800 cormorants were counted on Rat Island, but we only found 18 nests. More than half the cormorants were immature birds.

Harlequin Duck: Nearly 500 harlequins were noted, scattered in the nearshore zone.

Common Eider: More than 750 were counted. Flocks were either almost all male or almost all female. It seemed the males were mostly still flightless.

Bald Eagle: This species was very abundant. At least 5 were feeding at a mostly clean whale skeleton, probably a Minke whale based on size.

Peregrine: Lots of fledglings were seen.

Black Oystercatcher: A total of 37 were counted.

Parasitic Jaeger: At least 8 different individuals were seen.

Glaucous-winged Gull: Lots of 1 and 2 year olds as well as some fledglings were seen.

Pigeon Guillemot: We noted more than 200 guillemots.

Common Murre and Thick-billed Murre: Scattered single murrets of both species, but more frequently common murrets, were seen feeding in kelp forests.

Marbled Murrelet: A total of 3 were seen on the south side.

Ancient Murrelet: Seven scattered birds were counted.

Horned puffin: About 130 were seen.

Tufted puffin: About 160 were seen.

Rosy Finch: A few were noticed on the cliffs.

Winter Wren: This species was heard commonly

Sea lions: No attempt was made to count these to avoid disturbance.

Sea Otter: 10 were counted, at least a few with small pups.

Harbor Seal: We noted 36.

Appendix H. Surveys for Cormorants and Other Species at Amchitka Island, August 3-4, 2004

On August 3-4, 2004 J.C. Williams, Jeremiah Trimble and Peter Trimble in one crew and G.V. Byrd, Ian Jones, and Jacques Marais in a second crew surveyed the coastline of the north side of Amchitka with inflatable skiffs. On August 3 the seas were calm and visibility was good except at the west end of the island where dense fog precluded observations. We tried to survey the south side of the island on August 4, but only got one section before fog, kelp, and a sw swell stopped us. The kelp beds sometimes made it difficult to get close to shore. Some surveys were up to 100 m from shore, but most of the time we were able to work our way in to 50-75 m.

Cormorant Counts

We counted 418 red-faced cormorants, and 630 pelagic cormorants on the north side of Amchitka Island (Table H-1). We could not assign another 251 to species. The grand total was 1,274 cormorants on or near cliffs (Table H-1). Interestingly, there were only 56 nests, 0 red-faced cormorant nest and 14 pelagic cormorant nests and 44 that were empty so we could not tell which species built them. About 73% of red-faced cormorants and 67% of the pelagic cormorants we saw were immatures (from Table H-1).

Cormorant Productivity

We saw no red-faced cormorant nests. Of 14 pelagic cormorant nests, 3 (21%) were empty (Table H-2). All 44 nests where we could not determine species were empty.

Other Species

We counted almost 3,000 glaucous-winged gulls near the coastline in the stretch we surveyed. The next most commonly seen species were common eider, harlequin duck, tufted and horned puffins, and pigeon guillemot (Table H-3). Information on other species encountered is recorded in the annotated list below.

Comparisons

We were unable to make detailed comparisons because previous surveys at Amchitka were of the entire coastline and were made by helicopter. Nevertheless, we found more cormorants on the north side of Amchitka than were estimated to be on the entire island in the early 1970s (White et al. 1977).

Table H-1. Counts of cormorants at Amchitka Island on August 3-4, 2004.

Species		B-C ^a	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-K	K-L	L-M	M-N	N-O	Totals
RFCO ^b	adult	3	3	0	28	3	20	0	3	15	5	0	34	2	116
	brown	4	3	0	28	22	1	0	4	30	10	0	200	0	302
	unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nests	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	sub total	7	6	0	56	25	21	0	7	45	15	0	234	2	418
PECO	adult	26	18	21	22	7	15	3	18	6	24	10	28	16	214
	brown	25	50	30	25	48	7	0	58	54	66	14	44	3	424
	unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nests	0	0	2	3	0	0	0	0	0	9	0	0	0	14
	sub total	51	68	51	47	55	22	3	71	60	90	24	72	16	630
UNCO	adult	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	brown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	unknown	7	6	0	30	2	102	19	21	52	12	0	41	15	307
	nests	0	0	0	26	0	0	0	0	6	12	0	0	0	44
	sub total	7	6	0	30	2	102	19	21	52	12	0	0	15	266
Totals	birds	65	80	51	133	82	143	22	99	152	117	24	306	33	1,307
	nests	0	0	2	29	0	0	0	0	6	19	0	0	0	58

^aSee Fig. H-1 for segment locations.

^bRFCO = red-faced cormorant, PECO = pelagic cormorant, UNCO = unidentified cormorant

Table H-2. Productivity of cormorants at Amchitka Island

Status of Nests	Unidentified Cormorant	Pelagic Cormorant
Empty	44	1
Present ^a	0	1
1 chick	0	5
1+chick	0	0
2 chick	0	5
3 chick	0	2
Total	44	14

^aadults incubating or brooding so that contents of nests not seen

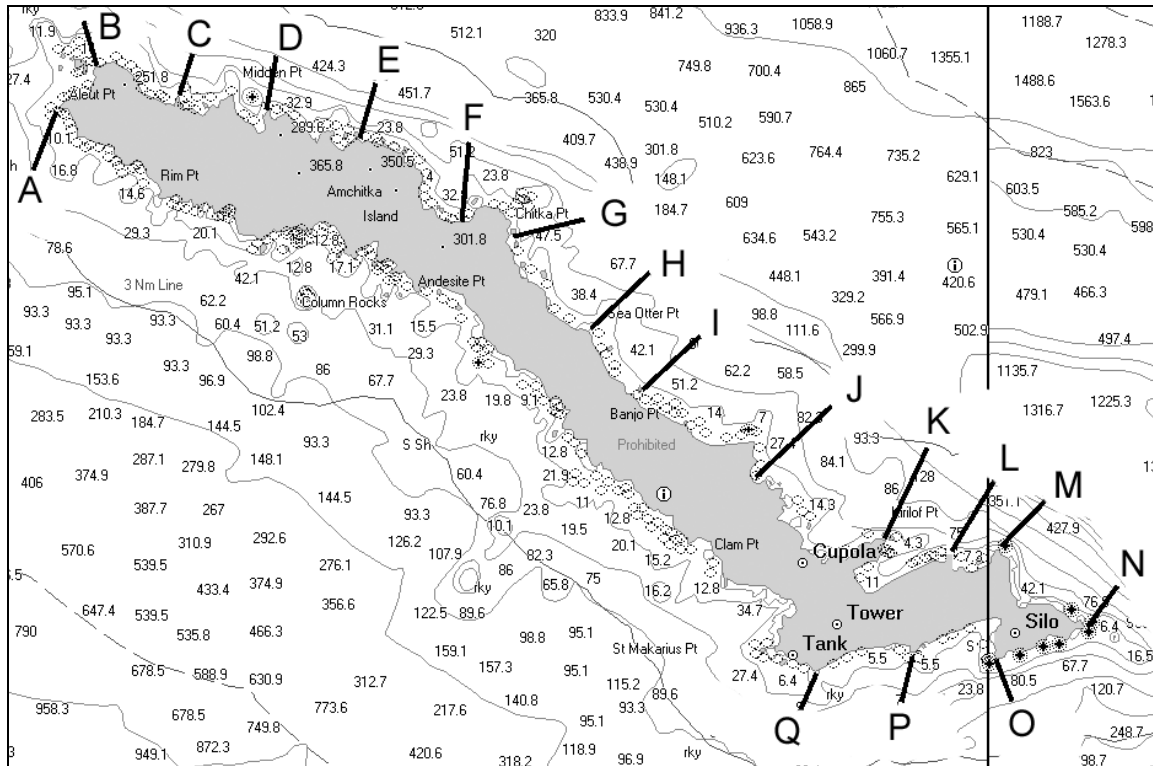


Figure H-1. Chart of Amchitka Island showing the segments used in nearshore boat surveys. Note, we did not survey much of the south side of the island.

Species	B-C ^a	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-K	K-L	L-M	M-N	N-O	Totals
GWGU ^b	152	118	83	65	104	430	180	494	431	136	100	466	170	2,929
PIGU	41	68	54	50	51	5	3	4	41	8	3	32	5	365
COEI male	0	25	1	1	0	0	0	0	1	3	6	0	0	37
female	66	206	173	181	75	13	13	88	288	190	37	23	0	1,353
creches	0	11	4	2	2	1	0	1	15	7	1	4	0	48
total	66	231	174	182	75	13	13	88	289	193	43	23	0	1,390
HADU	65	109	21	11	46	21	52	46	99	94	45	25	1	635
RBME	0	3	10	3	0	3	0	43	31	7	4	0	0	104
BLOY	8	5	15	24	10	6	0	8	24	15	6	7	5	133
BAEA adult	3	6	3	1	5	3	3	9	5	2	2	5	5	52
juv	0	1	1	0	0	0	0	1	1	1	1	0	0	6
chicks	3	0	2	1	3	0	0	4	3	0	0	1	0	17
total	3	7	4	1	5	3	3	10	6	3	3	5	5	58
PEFA	0	2	4	1	0	0	3	3	4	6	3	3	0	29
MAMU	0	0	0	0	0	0	0	0	1	0	0	0	0	1
HOPU	12	40	86	15	6	1	62	2	57	7	34	39	24	385
TUPU	16	66	164	87	29	0	0	1	98	33	16	226	23	759
COMU	3	0	2	4	6	3	7	2	3	2	1	2	0	35
TBMU	0	0	0	1	1	0	0	0	1	0	0	0	0	3
PAJA	0	0	0	0	0	0	0	6	2	0	1	33	0	42
SEOT	9	2	11	5	13	15	0	12	21	9	34	0	0	131
HASE	3	10	0	0	8	5	4	8	7	0	11	0	0	56

^aSee Fig. H-1 for segment locations

^bGWGU = glaucous-winged gull, PIGU = pigeon guillemot, BLOY = black oystercatcher, TUPU = tufted puffin, HOPU = horned puffin, COEI = common eider, HADU = harlequin duck, RBME = red-breasted merganser, BAEA = bald eagle, PEFA = peregrine falcon, MAMU=marbled murrelet, KIMU = Kittlitz's murrelet, COMU = common murre, TBMU = thick-billed murre, PAJA = parasitic jaeger, SEOT=sea otter, HASE = harbor seal

Annotated List of wildlife observed at Amchitka

Red-throated Loon: We noted at least 8 different birds in nearshore waters or flying over.

Arctic Loon: A basic plumage loon surfaced about 4 m from our skiff and it was seen very clearly. The large white areas of white on the flanks above the water line were clearly observed by Ian Jones and Vernon Byrd.

Pacific Loon/Arctic Loon: An alternate plumage pacific or arctic loon flew over us and circled 4-5 times. Ian Jones thought there was a large amount of white on the flanks, suggesting arctic.

Cormorants: More than 1,300 cormorants were counted on the north side of Amchitka. There were an unusually high proportion of immature birds present and we found only 58 nests. At least 2 chicks had just fledged under the dock in Constantine Harbor.

Mallard: A female with a brood of 5 ducklings was seen near Ivakin Point.

Green-winged Teal: A total of 18 birds, most in basic plumage, were present near Midden Cove.

Greater Scaup: A single bird was seen near Constantine Harbor

Red-breasted Merganser: We counted 104 female plumaged birds and saw at least 4 broods.

Harlequin Duck: More than 600 harlequins were scattered in the nearshore zone. Many appeared to be flightless.

Common Eider: Nearly 1,400 were counted, mostly females. We saw 48 creches but almost certainly missed a number of others. At least one female was flightless.

Bald Eagle: This species was common. Some chicks were still in nests and others had fledged.

Peregrine: This species was seen regularly on coastal cliffs and bluffs.

Black Oystercatcher: Although the survey was not ideal for seeing this species, 133 were noted including at least 5 fledglings.

Rock Sandpiper: At least 4-5 were noted on offshore rocks.

Pomarine Jaeger: A single bird was seen flying offshore.

Parasitic Jaeger: This species is common at Amchitka and our surveys were not ideal for recording them, since most are inland. Nevertheless we noted 42 birds from the skiffs.

Glaucous-winged Gull: The nearly 3,000 gulls we observed included substantial numbers of 1 and 2 year olds, and we noted a number of fledglings.

Pigeon Guillemot: We noted 365 guillemots, many were carrying fish including sculpin.

Common Murre and Thick-billed Murre: Scattered single or pairs of murrelets of both species, but more frequently common murrelets, were seen feeding in kelp forests.

Marbled Murrelet: A single adult was seen in Kirilof Bay.

Least Auklet: At least 4-5 fledglings were seen.

Horned puffin: Nearly 400 were counted, most appeared to be feeding in or just outside the kelp forest.

Tufted puffin: We recorded 759 birds, most were associated with apparent breeding colonies on offshore islets (e.g., Kirilof Islets).

Rosy Finch: A few were noticed on the cliffs.

Winter Wren: This species was heard commonly.

Snow Bunting: One was seen on Bat Island.

Sea lions: We made no attempt to count sea lion to avoid disturbance, we stayed far offshore.

Sea Otter: We counted 131 animals. Most were in the very back of shallow coves. The largest concentration was between Constantine Point and Ivakin Point, at least 25 had small pups.

Harbor Seal: We noted 56 animals.

Killer Whale: Apparently a small male was noted inside a kelp bed near Bird Cape.