

Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 24-27 June 2004

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SUMMARY

The sixth consecutive aerial survey of common eiders and other waterbirds along the coastline of the Arctic Coastal Plain (ACP) of Alaska, including barrier islands, was conducted from 24 to 27 June 2004. Observations were made from an amphibious Cessna 206 (N61599) by pilot/observer and right seat observer. The study area, established when the survey was initiated in 1999, encompasses approximately 1,050 km of the Chukchi and Beaufort sea coastlines from Omalik Lagoon north and east to the Canadian border and an additional 190 and 325 linear kilometers, respectively, of barrier island habitats off Kasegaluk Lagoon and from Point Barrow to Demarcation Bay. Shorefast ice cover and limited amounts of open water in the Beaufort Sea characterized the first five survey years (1999-2003) of the survey while ice cover in the Chukchi Sea declined. The Chukchi Sea shoreline and offshore waters were essentially ice free during 2002-2004 surveys and increased amounts of open water were present in the Beaufort Sea in 2004.

A total of 3,033 common eiders, including 1,340 indicated breeding pairs (pairs+single drakes), were observed in 2004. Totals and indicated breeding pairs were up 42.9 and 53.3 percent, respectively from 2003 and 10.7 and 55.6 percent, respectively from the long-term average (1999-2004). The increase in total common eiders may be attributable to ice conditions in the western and central Beaufort Sea which may have either delayed (short-stopped) migrants or altered their routes as was suspected in 2002. Proportion of total birds and indicated breeding pairs increased along the Chukchi Sea coast and decreased in the Beaufort Sea in comparison with previous years (Dau and Taylor 2000a, 2000b, Dau and Anderson 2001, 2002, Dau and Hodges 2003). Other primary waterbird species observed and their change in numbers from 2003 were: glaucous gull 5,478 (-22%), Pacific brant 3,836 (+44%), long-tailed duck 3,527 (-64%), king eider 2,365 (-54%), surf scoter 1,543 (-73%), white-winged scoter 1,159 (+25%), northern pintail 751 (-15%) and greater scaup 408 (-18%). A total of 91 yellow-billed loon observed was over a two-fold increase from the 1999-2003 average of 43 birds.

INTRODUCTION

This report summarizes the sixth consecutive year of aerial survey efforts to estimate common eider population size and trend, demography, distribution and habitat conditions along the coastline of the Alaskan ACP. The survey area is north and east from Omalik Lagoon along the Chukchi Sea to Point Barrow then east along the Beaufort Sea to the Canadian border (Figures 1 and 2). The objective has been to estimate the size and trend of the Alaska breeding common eider population (i.e. indicated breeding pairs) along the ACP. These data will be useful for management of the species and for evaluating the potential impacts of on and offshore petroleum development and other activities in northern Alaska. The data can also be compared to long-term migration counts of the combined Alaska and Canadian populations at Barrow (Suydam et al. 1997, 2000a, 2000b).

METHODS

This survey is timed to coincide with egg laying and early incubation while pair bonds are intact

and males remain in the vicinity of breeding sites. Nesting studies during previous years were used to estimate breeding phenology and appropriate survey timing. An amphibious Cessna 206 was the survey platform in 2004 flown at approximately 110 knots and an altitude of 45 meters ASL/AGL. One observer acted as either pilot or right seat observer from 1999-2004 in addition to three additional pilots and two observers all with varying levels of experience. Observations, made from both sides of the aircraft by the pilot/observer (left) and observer (right), were entered directly into onboard computers using remote microphones. Computers were interfaced with the aircraft Global Positioning System (GPS) and, as in previous years, observations were collected and later transcribed using programs designed by John Hodges (MBM-Juneau). The survey area extended 1.6 km seaward of terrestrial habitats (i.e. mainland, peninsula and barrier island shorelines) when open water existed. Flight routes followed shorelines and included all island and peninsula habitats and near shore waters. Flight tracks were periodically checked on laptop computers using moving map programs to help ensure coverage near shore waters. Deviations were made to include larger flocks detected up to 3 km offshore. Flights were conducted in calm or light winds whenever possible and during mid-day to maximize sun-angle, reduce glare and increase the visibility of birds on the water. Increased flight time was required to adequately cover the survey area when survey conditions were not optimum.

The survey area includes 30 mainland shoreline segments and 22 islands or island groups identified on 1:250,000 scale topographic maps (Figs. 1 and 2). Insular areas along the central Beaufort Sea coast were also identified on 1:63,360 scale topographic maps. Maps were consulted during the survey primarily to identify segment start and stop points. General observations on habitat, survey and ice conditions were recorded and the latter was compared to sea ice analyses prepared by the National Weather Service (Figure 3). Whenever possible, sex and age (i.e. adult or subadult) of single birds and composition of flocks were determined for waterfowl species. Flocks that could be identified as assemblages of single adult males or pairs were recorded as singles and pairs. Observations of common eiders and other species were summarized by survey segment (Tables 1 and 2) and for the total survey area (Table 3). The distribution, sex and age composition and the number of indicated breeding pairs of common eiders were recorded by survey segment and summarized to estimate total population size (singles+2x pairs+birds in flocks) and the number of breeding pairs (Tables 4 and 5).

STUDY AREA/CONDITIONS

Physical descriptions of individual survey segments and the following groupings of segments are described by Dau and Taylor (2000). Survey and ice conditions encountered in 2004 were:

Omalik Lagoon to Point Barrow (Segments 1-11)

Omalik and Kasegaluk lagoons were ice free with only a small amount of sea ice south and west of Point Lay. There was no near shore sea ice north to Barrow but ice was visible 10-16 km to the northwest. Peard Bay itself was over 95 percent ice covered with melt on top with open water near entrances. Survey conditions were good with high scattered ceilings, southwest winds of about 5 knots and 38°F.

Point Barrow to the Colville River Delta (Segments 12-18)

Extensive shore fast sea ice with 0-10 m of open water along north shores east to Cape Simpson then 30-50 m open water near shore east to the Eskimo Islands. Near shore areas were ice free from Eskimo Islands east to the Colville River. Largest lakes had up to 50% ice cover. Elson Lagoon was 80% ice covered with approximately 10 m of open water along the north side of barrier islands with close pack ice north of that. Dease Inlet had 50-100 m of open water along the west shore and around Tiny Island. Oarlock Island was surrounded by 10-100 m of open water. The southern half of Admiralty Bay was 50% ice covered with open water at river mouths. The east shore of Dease Inlet had 10-200 m of open water and central and northern portions were continuous ice with melt on top. Smith Bay was 90% ice covered with melt on top and 2.5 km of open water along the south shore decreasing to 0.4 km near Drew Point. From Drew Point to Cape Halkett open water increased from 30-200 m. Harrison Bay and Kogru Peninsula were 80 and 95% ice, respectively. Harrison Bay had 200-800 m of open water along the west shore. Survey conditions were good with high scattered ceilings, southwest winds of 8-12 knots becoming calm. Temperatures initially in the high 30^os increased to the high 40^os F during the day.

Colville River Delta to the Canning River Delta (Segments 18-21, 190-214)

Thetis Island had a 400 m band of ice to the south then open water to the Colville River Delta. Sea ice was continuous beyond a 20 m band of open water along the north shore of Thetis Island. Simpson Lagoon from Oliktok Point east to Gwydyr Bay was 40-80% ice covered with melt on top. Ice along the south shores of barrier islands from Spy Island to Long Island slowly increased from 10 m in the west to 1200 m in mid Gwydyr Bay. Simpson Lagoon was ice free from the Kuparuk River mouth east to West Dock. Shore fast ice was mostly continuous north of barrier islands. Prudhoe Bay was mostly ice covered north of a line from the base of West Dock to Gull and Niakuk islands. Nearly continuous shore fast ice was present along north shores from Reindeer Island east to Flaxman Island. Open water south of these islands ranged from 10 m at Cross Island to 50-300 m south of the Maguire Islands. The lagoon was ice free from mid Flaxman Island to Brownlow Point. From Mary Sachs entrance west to Bullen Point the lagoon was 50% ice with melt on top. Inner portions of Mikkelsen and Foggy Island bays were ice free as was the mouth of the Sagavanirktok River. Tigvariak Island had shore fast ice along the north shore. Open water occurred along the mainland shore from West Dock east to Bullen Point where shore fast ice was encountered. From just east of Bullen Point to Point Thomson there was 10-100 m of open water along the shoreline.

Canning River Delta to the Canadian Border (Segments 22-29)

The Canning River lagoon was ice free except the eastern 1/3 which had 20% ice cover. There was open water from Brownlow Point to Konganevik Point with the exception of 50-100 m of onshore ice at Brownlow Point. Camden Bay was 80% ice covered with melt water on top and 800-1200 m of open water along shorelines. Arey Lagoon was ice free except at the east end which was 5-10% ice covered. Open water extended 200-400 m north of barrier islands east to Kaktovik. Kaktovik Lagoon was 60% ice covered while Jago and Tapkaurak lagoons were ice free. Oruktalik, Pokok, Angun and Beaufort lagoons and Pokok Bay were 50-70% ice covered. Siku Lagoon was ice free to the confluence with Demarcation Bay where it was 50% ice covered. Demarcation Bay was 80% ice covered with 100-200 m open along shorelines. North of Jago Lagoon and east to the Canadian border there was up to 100 m of open water with broken/floating ice and mostly open water farther north.

RESULTS/DISCUSSION

Data on nest chronology from ground studies were lacking for 2004 which was assumed comparable or slightly earlier than 2003 based on reports from field workers. We believe the 2004 survey coincided with pair residency at breeding sites (i.e. egg laying and early incubation) and that data are appropriate for comparison to previous years.

A total of 3,033 common eiders, including 1,340 indicated breeding pairs, were observed in 2004 (Figures 1 and 2; Tables 3 and 4a-b). Total birds and indicated breeding pairs were up 42.9 and 53.3 percent, respectively, from the 2003 counts of 2,123 birds and 874 pairs. Total birds and indicated pairs in 2004 were up 10.7 and 55.6 percent, respectively, from the 1999-2004 averages of $2,741 \pm 1,032$ (1SD, range 1,353-4,449) birds and 861 ± 264 (1SD, range 572-1,340) pairs. Number of common eiders observed and estimates of indicated breeding pairs increased in the three primary use areas (Table 5, Figure 4) with greatest proportional increases at Kasegaluk Lagoon (1,553 total birds, 51.2%; 414 indicated breeding pairs, 30.9% of total) (Tables 2, 4b and 5; Figure 4).

Flocked birds in 2004 totaled 1,033 (34.1% of total), a dramatic increase from the 815 (38.4% of total) observed in 2003. Number and composition of common eider flocks has varied however, adult males have predominated in five of six years (Table 7). Thirty subadult males (1.0% of total observations) were observed in 2004 versus none in 2002 or 2003. Subadult males made up 1.3, 0.3 and 0.4 percent, respectively, of total observations in 1999, 2000 and 2001. Detectability of subadults is likely related to observer experience; nevertheless, the low number reported suggests that breeding adults predominate along the ACP.

This survey documents but does not fully explain the increase in total birds and indicated breeding pairs occurring in 2004 (Table 5). It is encouraging that the estimate of indicated breeding pairs from 1999-2003 showed less geographic and area-wide variability than did total numbers as that index is believed to be indicative of breeding effort along the ACP of Alaska. Ice conditions in 2002 may have delayed (short-stopped) or altered routes of common eiders enroute to Canadian breeding sites thereby increasing numbers observed during this survey (Tables 5 and 6). Total numbers declined in 2003

and rose sharply again in 2004 when open water was the most extensive thus far observed.

The extent and potential causative factors, including ice conditions, affecting common eider use of the survey area require further investigation. Changes in quality of breeding habitat (i.e. amount and distribution of drift wood and vegetation on peninsulas and barrier islands) may also result in variability in numbers and distribution of common eiders, especially breeding pairs which nest in association with ground cover. Storm events and tidal action erodes vegetation and deposits or removes drift wood and detritus. Common eiders respond to these changes in habitat conditions and continuance of this survey will help document long-term patterns of distribution. In addition to subjective observations of the amount of drift wood and detritus on peninsulas and barrier islands, annual or periodic quantitative measures of ground cover required by breeding common eiders would be valuable.

RECOMMENDATIONS

- 1) Continue annual aerial survey timed to coincide with or precede onset of incubation to monitor the distribution, abundance, composition, and habitat use of the common eider population summering along the Alaska ACP.
- 2) Collaborate with other researchers to obtain ground survey data of birds and nests within the survey area to aid in survey timing and to potentially provide air:ground visibility indices.
- 3) Continue to obtain subjective estimates of the amount and distribution of drift wood and detritus on barrier islands and peninsulas.
- 4) Investigate the potential for a photographic sampling protocol to determine the amount and distribution of ground cover (vegetation, drift wood and detritus) and changes over time.

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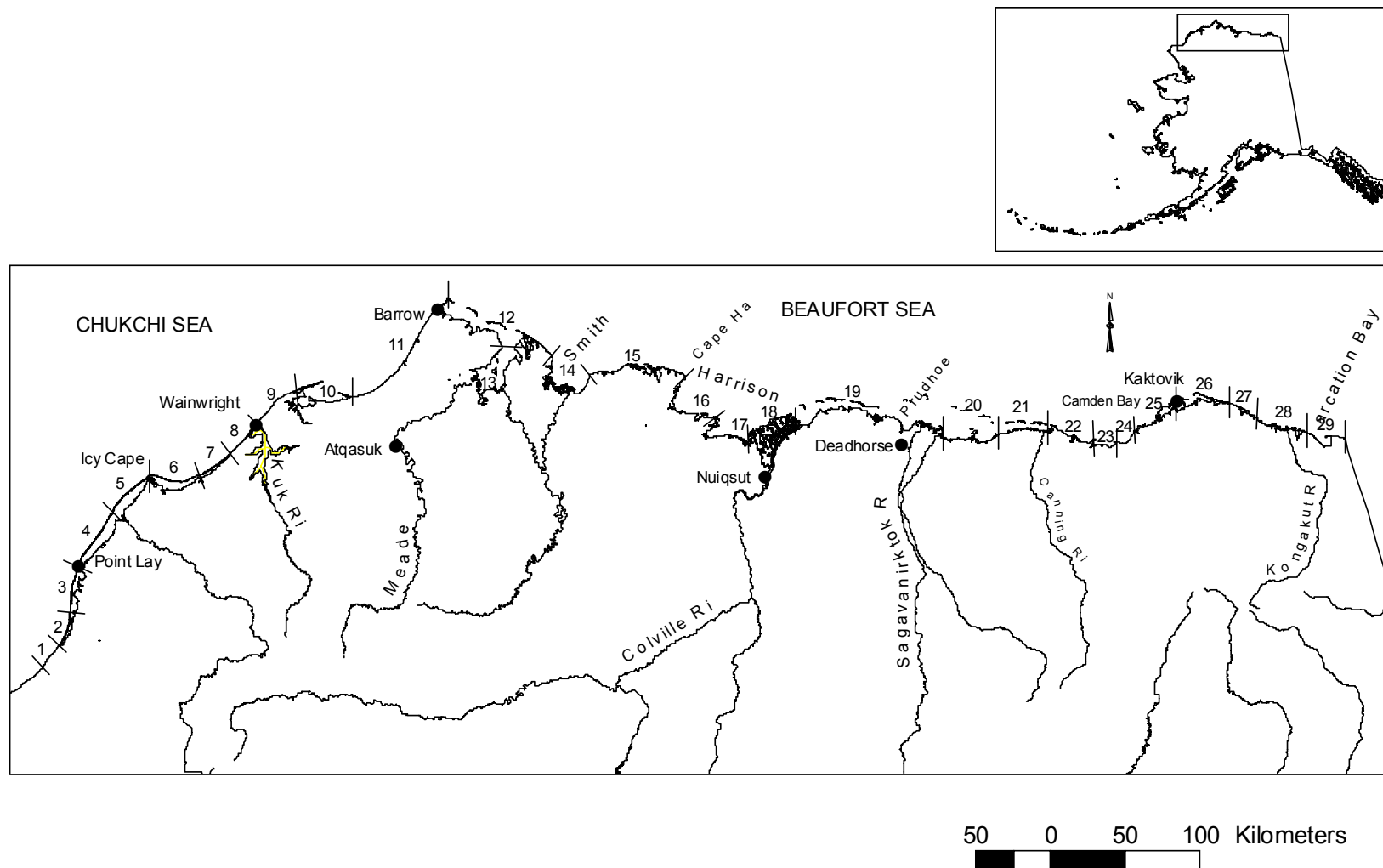


Fig. 1. Location of aerial survey segments searched for common eiders along the Arctic Coast, Alaska

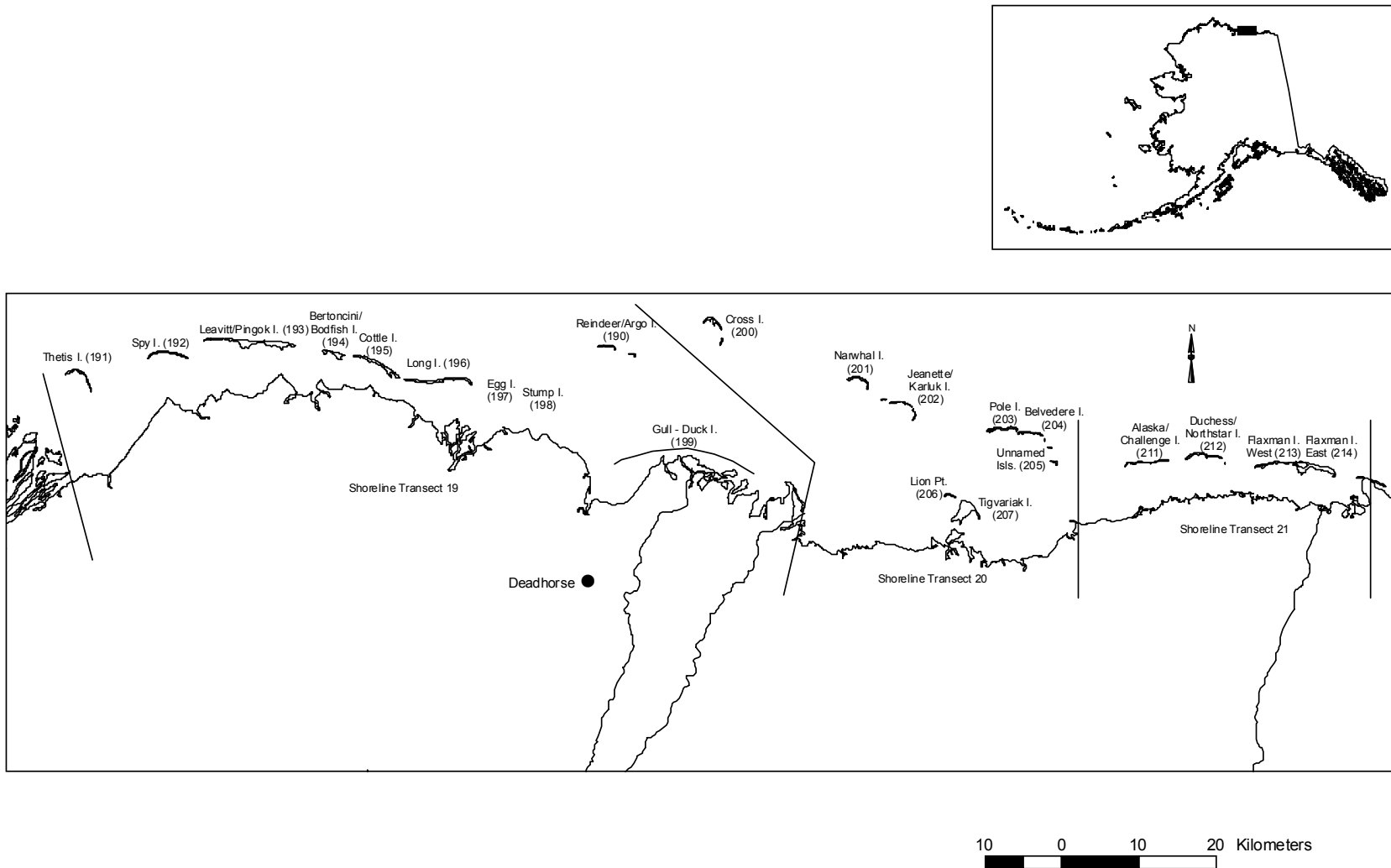


Fig. 2. Survey segments, including coastline and barrier islands, along the central Arctic Coastal Plain, Alaska.

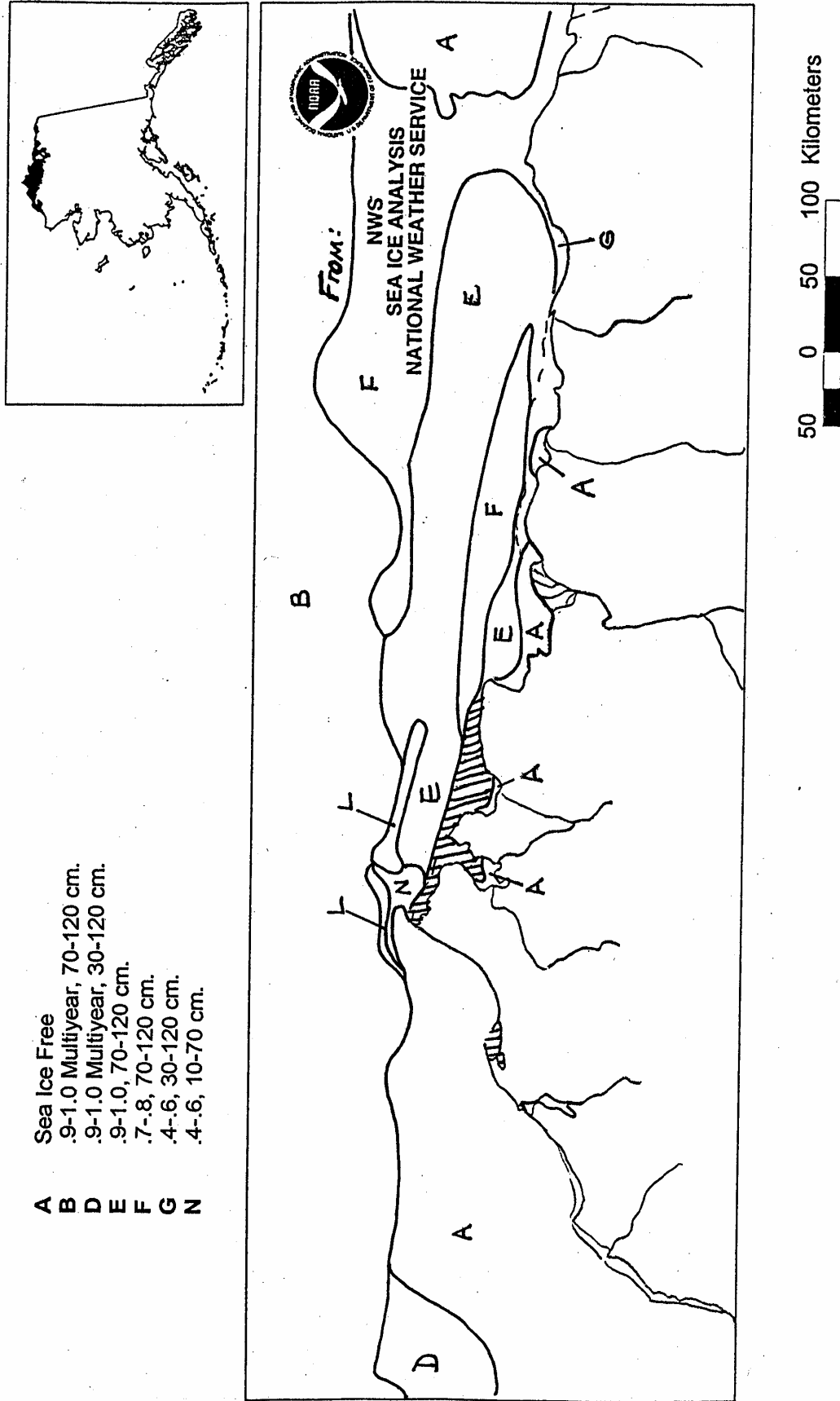


Figure 3. Sea ice conditions in late June along the Arctic Coastal Plain, 2004.

Table 1. Species totals by segment along barrier islands of the ACP, 24-27 June, 2004.

Species	Segment Number																				Total		
	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	211	212		213	214
ARTE					2						4				40	2				1			49
BLBR										19								10					29
CAGO																						6	6
COEH ¹									1	1	5												7
COEI		2	8	4				102	71	95	11	12	2	7	25	1	3	23	11	35		2	414
GLGU	7	4	7	8	18	3	5	21	42	167	23	4	2	2	4	2	2	30	10	2	5	3	371
GRSC										2													2
KIEH ¹			1																				1
KIEI		1		9	2	2		42	2	20						8		2	2				90
LTDU			23	20	1	96	2	5	5	20	26		3		20	10							231
NOPI							2			5								10					17
PALO				7			7	6	7	6			1										34
RBME		3						2		16	1							4					26
RTLO			2	4		2				10								1					19
SAGU					1	4					2												7
SNGO										421								12					433
SUSC								50		50													100
TUSW					1													1				2	4
WFGO				42	18			2															62
WWSC						10	1	80		10								4					105
YBLO			1				4																5

¹ COEH, KIEH = common and king eider hens in singles and flocks.

Table 2. Species totals by segment along ACP mainland shoreline, 24-27 June, 2004.

Species	Segment Number																													Total				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29					
AMWI		10																																10
ARTE		192	154	609	264	21	10		1	13		237	1	27	40												5	1	4				1579	
BLBR		2	32	144	1074	38	5			65		306	210	93	581	155	120	631	211	90	41				5		2	2				3807		
BLGU												4																					4	
BLKI	1	8								4	2																						15	
BLSC			1					8																		1				4			14	
CAGO													60	189	183	63			8	68													571	
CEJV				3	13			10			1														3								30	
COEH		14	9	12	7	10	2			1	2			5					5	8		2	1			1		2				81		
COEI		2	12	605	289	509	66	11		108	27			8					165	130	55	158	32		49	130		94	51			2501		
CORA																			1														1	
GLGU	17	77	133	1065	404	996	292	147	17	199	56	138	61	125	24	6	13	95	287	227	47	78	66	2	248	183	31	29	44		5107			
GRSC	10		20		2					2		1	12	316						10			18			15						406		
GYRF												1																					1	
JAEG		2														1				1													4	
KEJV				1																													1	
KIEH				5		15				1	6			1		2		2	1	1	1					1							36	
KIEI		1	18	189	775	197	91	455	1	12	140	27		3	4	37	139		15	23	39	42	2		10	7				10		2237		
LTDU	304	522	290	86	37	703	108	2	6	28	21	318	159	44	29	13	4		20	179	11	24	4		28	41	27	269	19		3296			
LTJA		1				2				1											1												5	
MALL														1																			1	
NOPI		315	9	143	10	118	31			33		15	8			1			20	11	5				15							734		
PAJA		2											1																				3	
PALO	1	2	11	2		12	20	2	2	26	14	39	7	17	19	20	3	1	25	11	17	9	1		5	9	4	2			281			
RBME	4	7	7			422	4							2	2	2	2		19	8	2	2	4		6	22	3	30	69		617			
RTLO	26	10	3	4		8	4				3	29	5	7	9	5	2	2	6	2	5	3				5		2				140		
SAGU				2								75	5		2					14						1						99		
SMSH		4																															4	
SNGO																2	7	1	10	15													35	
SPEH										1																							1	
SPEI										5	3				1	2	2																13	
SUSC	32	5	196													110	126		102	42	35	44	43		15	670		1	22		1443			
TUSW			2		2	1	2			2		2	12						9	3	1		1	2		3	1	3				46		
WFGO	10	59	7	12	24	51				25	16	57	43	185	28	123	134	142	355	38	12	2				4	20		2			1349		
WWSC	22		138																100	4		186	24		36	137	40	320	47			1054		
YBLO				1		24	10		2	15	1	10	5	1	2	9			2	2						1	1					86		

¹ CEJV, KEJV = common and king juveniles in singles and flocks.² COEH, KIEH, SPEH = common, king and spectacled eider hens in singles and flocks.

Table 3. Total birds for all areas, ACP coastline, 24-27 June 2004.

Species	Mainland	Barrier Isl.	Total
AMWI	10		10
ARTE	1579	49	1628
BLBR	3807	29	3836
BLGU	4		4
BLKI	15		15
BLSC	14		14
CAGO	571	6	577
CEJV ¹	30		30
COEH ²	81	7	88
COEI	2501	414	2915
CORA	1		1
GLGU	5107	371	5478
GRSC	406	2	408
GYRF	1		1
JAEG	4		4
KEJV	1		1
KIEH ²	36	1	37
KIEI	2237	90	2327
LTDU	3296	231	3527
LTJA	5		5
MALL	1		1
NOPI	734	17	751
PAJA	3		3
PALO	281	34	315
RBME	617	26	643
RTLO	140	19	159
SAGU	99	7	106
SMSH	4		4
SNGO	35	433	468
SPEH ²	1		1
SPEI	13		13
SUSC	1443	100	1543
TUSW	46	4	50
WFGO	1349	62	1411
WWSC	1054	105	1159
YBLO	86	5	91

Table 4a. Common eider sex and age composition and totals in shoreline segments, ACP, 2004.

SEGMENT	SINGLES		PAIRS		TOTAL JUVENILES	FLOCKED BIRDS		TOTAL ³
	Adult Male	Female	No.	Indicated Total ¹		Total	Male:Dark Birds ²	
1								0
2		14	1	1				16
3	2	9	5	7				21
4	78	12	137	215	3	253	205:48	620
5	51	7	59	110	13	120	42:59	309
6	18	10	35	53		421	232:183	519
7	5	2	23	28		15	8:7	68
8	3		4	7	10			21
9								0
10	38	1	10	48		50	40:10	109
11	7	2	5	12	1	10		30
12								0
13								0
14								0
15	4	5	2	6				13
16								0
17								0
18								0
19	68	5	28	96		41	35:0	170
20	78	8	26	104				138
21	9		23	32				55
22	51	2	31	82		45	45:0	160
23	22	1	5	27				33
24								0
25	19		15	34	3			52
26	56	1	37	93				131
27								0
28	50	2	18	68		8		96
29	23		14	37				51

¹ Single males+pairs = Indicated total pairs.

² Flocks from which sex ratios were obtained. Dark birds = females and subadults.

³ Total= singles+2x pairs+ flocks.

Table 4b. Common eider sex and age composition and totals in barrier island segments, ACP, 2004.

SEGMENT	SINGLES		PAIRS		TOTAL JUVENILES	FLOCKED BIRDS		TOTAL ³
	Adult Male	Female	No.	Indicated Total ¹		Total	Male:Dark Birds ²	
190								0
191	2			2				2
192	4		2	6				8
193	2		1	3				4
194								0
195								0
196								0
197	35		6	41		55	38:17	102
198	48	1	4	52		15	10:2	72
199	45	1	25	70				96
200	7	5	2	9				16
201			6	6				12
202			1	1				2
203	3		2	5				7
204	19		3	22				25
205	1			1				1
206	3			3				3
207	11		6	17				23
211	9		1	10				11
212	27		4	31				35
213								0
214			1	1				2

¹ Single males+pairs = Indicated total pairs.

² Flocks from which sex ratios were obtained. Dark birds = females and subadults.

³ Total= singles+ 2x pairs+ flocks.

Table 5. Proportional distribution of totals and indicated pairs of common eiders along the ACP, 1999-2004

AREA (Segment No.)	1999 (%)		2000 (%)		2001 (%)		2002 (%)		2003 (%)		2004 (%)	
	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs
Kasegaluk Lagoon (2-7)	176 (13.0)	69 (12.1)	914 (34.5)	119 (13.8)	747 (26.3)	165 (24.4)	1802 (40.5)	177 (21.0)	657 (31.0)	171 (19.6)	1553 (51.2)	414 (30.9)
Peard Bay (10)	106 (7.8)	36 (6.3)	7 (0.3)	1 (0.1)	288 (10.2)	73 (10.8)	258 (5.8)	83 (9.9)	121 (5.7)	67 (7.7)	109 (3.6)	48 (3.6)
Central Beaufort Sea Coast (18-21, 181-214)	542 (40.1)	378 (66.1)	760 (28.7)	424 (49.1)	531 (18.7)	277 (41.0)	1347 (30.3)	350 (41.6)	647 (30.5)	331 (37.9)	784 (25.8)	512 (38.2)
Canning R.-Demarcation Bay (22-29)	299 (22.1)	75 (13.1)	956 (36.1)	319 (37.0)	1242 (43.8)	158 (23.4)	1005 (22.6)	224 (26.6)	476 (22.4)	267 (30.5)	523 (17.2)	341 (25.4)
Other areas (1, 8-9, 11-17)	230 (17.0)	14 (2.5)	12 (0.5)	0	29 (1.0)	3 (0.4)	37 (0.8)	7 (0.8)	222 (10.4)	38 (4.3)	64 (2.1)	25 (1.9)
TOTALS	1353	572	2649	863	2837	676	4449	841	2123	874	3033	1340

Table 6. Species totals for all areas, ACP, 1999-2004.

Species	Total Birds Observed					
	1999	2000	2001	2002	2003	2004
AGWT	0	0	0	6	0	0
AMWI	0	0	0	0	0	10
ARTE	901	127	1530	241	671	1628
BLBR	2329	1411	2215	1319	2656	3836
BLGU	1	8	18	9	823	4
BLKI	0	0	29	92	0	15
BLSC	3	0	0	546	0	14
CAGO	1554	659	465	425	823	577
CEJV ¹	18	8	10	0	0	30
COEH ²	92	330	295	215	114	88
COEI ³	1243	2311	2532	4234	2009	2915
COLO	0	0	1	0	2	0
COMU	0	0	0	40	0	0
COME	0	0	4	0	0	0
CORA	0	0	1	2	2	1
GLGU	4462	3345	5499	2703	7031	5478
GRSC	1011	944	744	99	495	408
GYRF	0	0	0	0	0	1
JAEG	0	12	0	0	1	4
KEJV ¹	0	0	0	0	0	1
KIEH ²	9	61	48	146	35	37
KIEI	892	427	1716	10719	5334	2327
LGSH	0	0	0	0	7	0
LTJA	1	3	0	0	1	5
LTDU	4890	5726	5544	5110	9724	3527
MEGU	0	0	8	21	0	0
MESH ⁴	0	0	62	0	0	0
NOFU	0	0	0	1	0	0
NOPI	1268	779	2752	516	879	751
PAJA	4	9	81	7	10	3
PALO	443	429	208	537	325	315
POJA	0	3	0	0	4	0
RBME	710	1985	194	108	265	643
RTLO	85	198	154	64	233	159
SACR	2	2	2	2	1	0
SAGU	99	4	442	20	185	106
SMSH ⁴	0	3	0	0	0	4
SNGO	124	986	192	164	454	468
SNOW	14	0	1	6	4	0
SPEH ²	2	0	0	0	0	1
SPEI	11	15	45	14	8	13
STEI	0	0	2	1	0	0
SUSC	2073	11113	2644	1500	5764	1543
TUNE ⁵	9	0	0	1	1	0
TUSW	32	84	30	269	49	50
WFGO	521	1269	623	425	255	1411
WWSC	128	765	1622	1485	931	1159
YBLO	40	51	40	34	48	91

¹ CEJV, KEJV = COEI and KIEI juveniles in singles and flocks.² COEH, KIEH, SPEH = common, king or spectacled eider hens in singles and flocks.³ COEI = single adult males and birds in pairs and flocks.⁴ MESH = medium shorebird; SMSH = small shorebird.⁵ TUNE = tundra swan nest.

Table 7. Common eider flock composition along the coastline of the Alaska ACP.

Year	Flock Total	Total Classified	Adult Males	Brown Birds ¹	Ratio ²
1999	546	351	129	222	0.6:1
2000	1469	1191	613	578	1.1:1
2001	1785	1546	930	616	1.5:1
2002	3083	2423	1533	890	1.7:1
2003	815	363	189	174	1.1:1
2004	1033	991	665	326	2.0:1

¹ Brown Birds = Females and Subadults.

² Adult Male:Brown Birds.

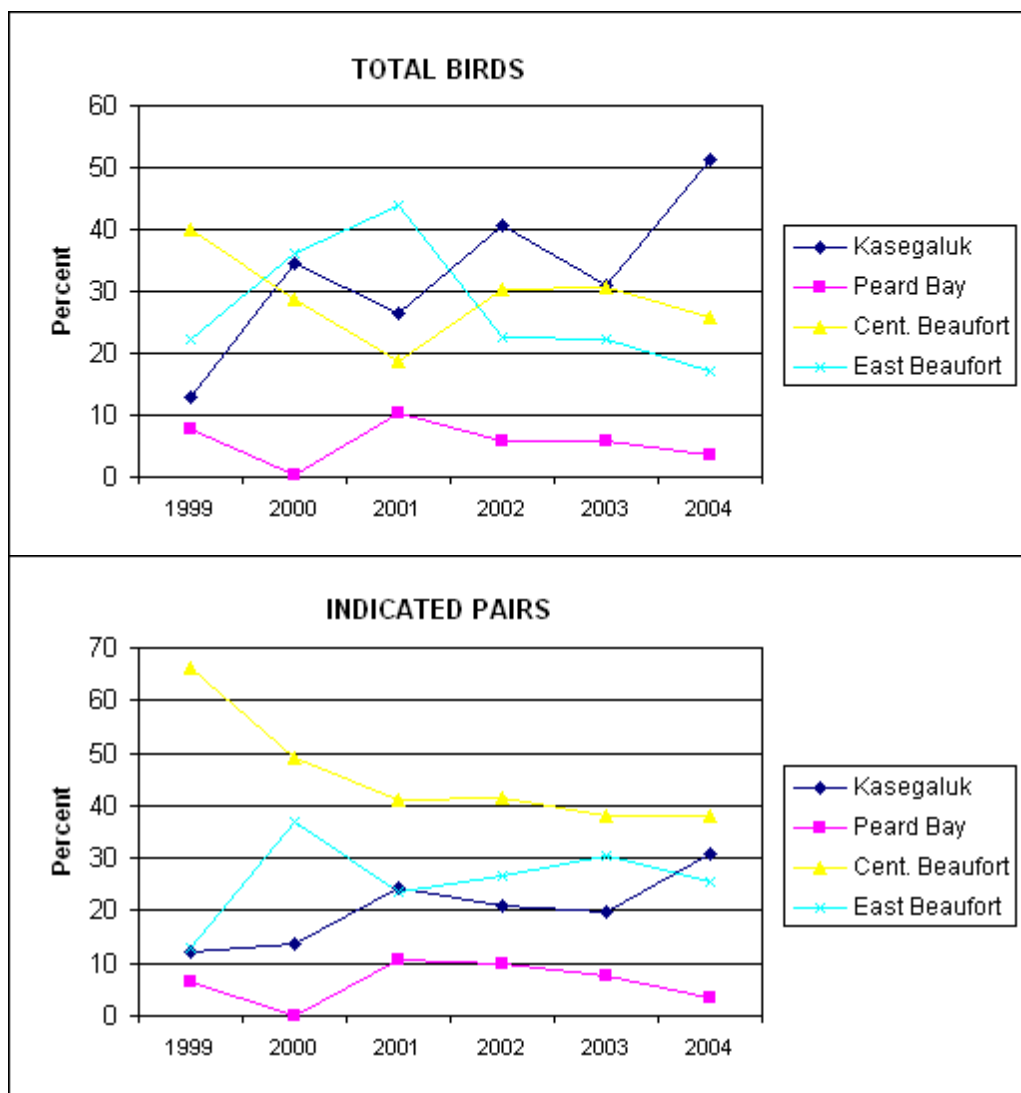


Figure 4. Trends in percent distribution of total and indicated breeding pairs of Common Eiders.