

Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 25-27 June 2006

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Key Words: Aerial population survey, Common Eider, waterbirds, barrier islands, Arctic Coastal Plain, Alaska

August 2006

SUMMARY

The eighth 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 25 to 27 June 2006. 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 in the Chukchi Sea was more extensive in 2006 than in 2005 while Beaufort Sea ice cover was similar in both years. Sea ice was dark and showed signs of more rapid melting in 2006. Ice free areas in the Beaufort Sea were limited and most barrier islands were again accessible to terrestrial predators.

A total of 3,102 common eiders, including 1,207 indicated breeding pairs (pairs+single drakes), were observed in 2006. Total observed and indicated breeding pairs were up 20.2 and 7.7 percent from 2005 and up 12.1 and 28.8 percent, respectively, from the long-term averages (1999-2006). Total common eiders observed and indicated breeding pairs are increasing at annual rates of 6.3 and 10.8%, respectively. In 2006, the proportion of total bird observed increased only along the Chukchi Sea coast in comparison to 2005 while indicated breeding pairs increased only along the central and eastern Beaufort Sea coasts (Dau and Larned 2005). Other primary waterbird species observed and their change in numbers from 1999-2005 averages were: long-tailed duck 7,776 (+41.4%), glaucous gull 1,988 (-57.2%), surf scoter 5,591 (+40.5%), Pacific brant 3,242 (+45.4%), white-winged scoter 3,775 (+260.6%), king eider 3,140 (-3.6%), Canada goose 1,391 (+83.8%), lesser snow goose 1,060 (+134.5%), greater scaup 905 (+47.2%), and northern pintail 1,651 (+54.2%). Yellow-billed loons (n=99) increased 110.6% from the 1999-2005 average of 47 birds.

INTRODUCTION

This report summarizes the eighth 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 (Dau and Taylor 2000a, 2000b, Dau and Anderson 2001, 2002, Dau and Hodges 2003, Dau and Larned 2004, 2005). 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 objectives are to estimate the annual size of the Alaska breeding common eider population along the ACP using indicated breeding pairs as the index and to determine trends in number, demographics and distribution.

METHODS

This survey is timed to coincide with egg laying and early incubation when pair bonds are intact and males remain in the vicinity of breeding sites. Available literature summarized by Johnson and Herter (1989), subsequent studies, and this survey were used to estimate breeding phenology and appropriate survey timing. Observations were made from an amphibious Cessna 206 flown at approximately 110 knots and an altitude of 45 meters ASL/AGL. 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. As in previous surveys, computers were interfaced with the aircraft Global Positioning System (GPS) to geo-reference observations. 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 complete survey area coverage. 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 (Figs. 1 and 2) identified on 1:250,000 scale topographic maps. 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 voice 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 divided into singles and pairs as appropriate. 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 numbers 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 indicated 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 2006 were:

Omalik Lagoon to Point Barrow (Segments 1-11)

Omalik Lagoon and Kasegaluk Lagoon south and west of Point Lay were essentially ice free. Kasegaluk Lagoon from Point Lay to Utukok Pass was ice free in the south half and

30% ice covered to the north. Icy Cape to Nokotlek Point was 90% ice covered decreasing to 20% at the north end of Kasegaluk Lagoon. Shorefast ice began mid-way between Omalik Lagoon and the south end of Kasegaluk Lagoon extending north to Point Barrow. Nearshore open water up to 200 m wide was discontinuous increasing to 4 km at lagoon passes. Peard Bay was approximately 90 % ice covered. All sea and lagoon ice had abundant surface melt. Only the largest onshore lakes had remnant ice and the tundra was snow free. Survey conditions were good with high scattered to overcast ceilings, unlimited visibility, SE winds up to 15 knots and temperatures were 43 to 52°F.

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

Shorefast ice was continuous seaward from Point Barrow to Cape Simpson with 10-20 m open water or water over ice along the shore. Elson Lagoon was 98 % ice covered with extensive surface melt as was the northern 2/3 of Dease Inlet with the exception of 200-300 m open water along the east shore and approximately 50-100 m open around Tiny and Oarlock islands. Admiralty Bay was mostly ice free. Western Smith Bay had 400 m of open water near shore. The eastern ½ of Smith Bay was mostly open with dark melting ice decreasing to 3-5 km in width along the NE shore. Drew Point to Cape Halkett was shorefast, dark ice with 10-20 m open water along the shore. From Cape Halkett south and east along the shore of Harrison Bay, 100 m of open water with closed pack ice beyond decreased to ice free water 15 km east of Fish Creek. Kogru Inlet was 70% ice covered. Colville River channels were ice free as was the coastline to 10-12 km offshore and lakes were ice free. Survey conditions were high overcast to broken ceilings with occasional moderate glare. Winds were initially SW 8 knots becoming NW 10 knots throughout the day. Temperatures increased from 50° to 55°F.

Colville River Delta to the Canning River Delta (Segments 19-21, 190-214)

Open water in Simpson Lagoon extended east to Oliktok Point. The lagoon was 90% covered with dark, melting ice east to Milne Point decreasing to 50% cover to Kavarak Point with 1.6 km open water near shore. Simpson Lagoon was ice free from Beechey Point to West Dock. Mostly shorefast ice was present north of barrier islands (Thetis to Stump) with 30-100 m of open water or melt over ice near shore. The west side of Prudhoe Bay had ≤400 m of open water with brash near shore and was otherwise ice free east to Tigvariak Island. Broken to closed pack ice was visible to the north. Dark, shorefast ice with surface melt extended east to Point Thomson. Mikkelsen Bay and the lagoon east to Brownlow Point was 50% ice covered with no shorefast ice. There was up to 400 m open water south of barrier islands with dark shore fast ice to the north. Survey conditions were fair with some glare, high scattered ceilings and SW winds of 8 knots. Temperatures were 50-55°F.

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

From Brownlow Point east to Konganevik Point closed pack ice was present north of barrier islands and shorelines. Canning River lagoon was ice free. Camden Bay was 90% covered with dark, melting ice. Shorefast ice was present from Collison Point to

Anderson Point. Arey Lagoon west of the Okpilak River and east to Barter Island was ice free. Kaktovik Lagoon was mostly ice free and all lagoons from Jago Lagoon to Siku Lagoon were completely ice free. Pokok Bay was 40% ice covered. Demarcation Bay was 60% covered with dark, melting ice. North of barrier islands and exposed shorelines from Kaktovik east to the Canadian border, ice was mostly shorefast except at lagoon openings and bay mouths. From Anderson Point to Barter Island there was 800 m of broken ice (50% cover) near shore with closed pack beyond. From Barter Island east to Pokok Lagoon there was 800 m of open water near shore with closed pack beyond. Survey conditions were fair due to glare; otherwise ceiling and visibility was unrestricted with E to NE winds of 10-15 knots. Temperature increased from 39° to 48°F throughout the day.

RESULTS/DISCUSSION

Based on previous year's observations, the 2006 survey coincided with pair residency at breeding sites (i.e. late egg laying and early incubation) and data are appropriate for comparison to previous years.

A total of 3,102 common eiders, including 1,207 indicated breeding pairs, were observed (Figures 1 and 2; Tables 3 and 4a-b). Total birds and indicated breeding pairs were up 20.2 and 7.7 percent, respectively, from 2005 counts of 2,581 birds and 1,121 pairs. Total birds and indicated breeding pairs in 2006 were up 12.1 and 28.8 percent, respectively, from the 1999-2006 averages of 2,766±885 (1SD, range 1,353-4,449) birds and 937±264 (1SD, range 572-1,340) pairs. Total common eiders observed increased in Chukchi Sea and eastern Beaufort Sea segments and decreased in those along the central Beaufort Sea coast while indicated breeding pairs decreased in the Chukchi Sea and increased in both Beaufort Sea areas (Table 5, Figure 4). The greatest proportional increase was in total birds seen along the Chukchi Sea (up 62.7%), due to primarily to an increase in Peard Bay (531 birds versus 81 in 2005) (Tables 2, 4b and 5; Figure 4). Increasing trends in numbers of both total birds (6.3%/yr) and indicated breeding pairs (10.8%/yr) have been documented with pairs being least variable (Figure 5).

Flocked birds in 2006 totaled 1,159 (37.4% of total), which is proportionally comparable to 2005 (998 birds, 38.7% of total). Number and composition of common eider flocks indicates adult males have predominated in seven of eight years (Table 7). Nineteen subadult males (0.6% of total observations) were observed in 2006 versus two (0.1%) in 2005, 30 (1.3%) in 2004 and none in 2002 or 2003. Detectability of subadults is likely related to observer experience; nevertheless, the low number reported suggests that breeding adults predominate along the ACP.

Total numbers of common eiders observed, and to a lesser extent the number of indicated breeding pairs (Table 5), appears to be primarily affected by ice conditions which may concentrate Canadian migrants during some years. The number of indicated breeding pairs is believed to be indicative of reproductive effort along the ACP of Alaska and although numbers have varied, the trend appears stable (Figure 4). To better understand

changes in annual distribution it would be important to 1) evaluate fidelity of individual pairs to breeding sites and 2), if individual pair distribution varies, how this relates to annual productivity. Flint et al. (2003) documented low productivity and recruitment of common eiders along the coast of the central Beaufort Sea suggesting the population would decline unless supplemented by immigration or infrequent years of high recruitment.

During spring migration, sea ice distribution and the amount and location of open water near breeding site affects number and distribution of common eiders observed in the survey area. Preferred nesting sites are associated with driftwood, detritus and vegetation on barrier islands and peninsulas. Storm surges, wind and tide erode vegetation and annually alter the amount of available driftwood and detritus which in turn affects the suitability of breeding sites to nesting common eiders. Common eider distribution, abundance and demography may correspond to annual habitat conditions hence; continuation of this survey will help document long-term patterns of use.

RECOMMENDATIONS

- 1) Continue annual aerial survey to quantify and monitor the distribution, abundance, demographics, and habitat use of the common eider population summering along the Alaska ACP.
- 2) When available, utilize ground survey data of birds and nests within the survey area to aid in refining survey timing and potentially provide air:ground visibility indices.
- 3) Investigate techniques, including aerial photography, to annually or periodically quantify the amount and describe the distribution of ground cover (i.e. vegetation, drift wood and detritus) important to nesting common eiders.

REFERENCES

- Anthony, M. 1999. Aerial videography of eider nests on barrier islands along the North Slope in 1999. Summary Report-Not for Distribution. USGS-ABSC, Anchorage, Ak. 20pp.
- Dau, C.P. and E.J. Taylor. 2000a. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 28 June-2 July 1999. Unpubl. Rept. USFWS. Anchorage, Ak. 22pp.
- _____. 2000b. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 3-12 July 2000. Unpubl. Rept. USFWS. Anchorage, Ak. 23pp.
- _____ and P.D. Anderson. 2001. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic

- Coastal Plain of Alaska, 30 June-3 July 2001. Unpubl. Rept. USFWS. Anchorage, Ak. 16pp.
- _____ and P.D. Anderson. 2002. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 25-29 June 2002. Unpubl. Rept. USFWS. Anchorage, Ak. 16pp.
- _____ and J.I. Hodges. 2003. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 27-30 June 2003. Unpubl. Rept. USFWS. Anchorage, Ak. 18pp.
- _____ and W.W. Larned. 2004. 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. Unpubl. Rept. USFWS. Anchorage, Ak. 19pp.
- _____ and W.W. Larned. 2005. 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. Unpubl. Rept. USFWS. Anchorage, Ak. 19pp.
- Flint, P.L., J.A. Reed, J.C. Franson, T.E. Hollmen, J.B. Grand, M.D. Howell, R.B. Lancot, D.L. Lacroix, and C.P. Dau. 2003. Monitoring Beaufort Sea Waterfowl and Marine Birds. U.S. Geological Survey, Alaska Science Center, Anchorage, Alaska OCS Study MMS 2003-037. 125pp.
- Johnson, S.R. and D.R. Herter. 1989. The Birds of the Beaufort Sea. BP Exploration (Alaska) Inc. Anchorage, Ak. 372pp.

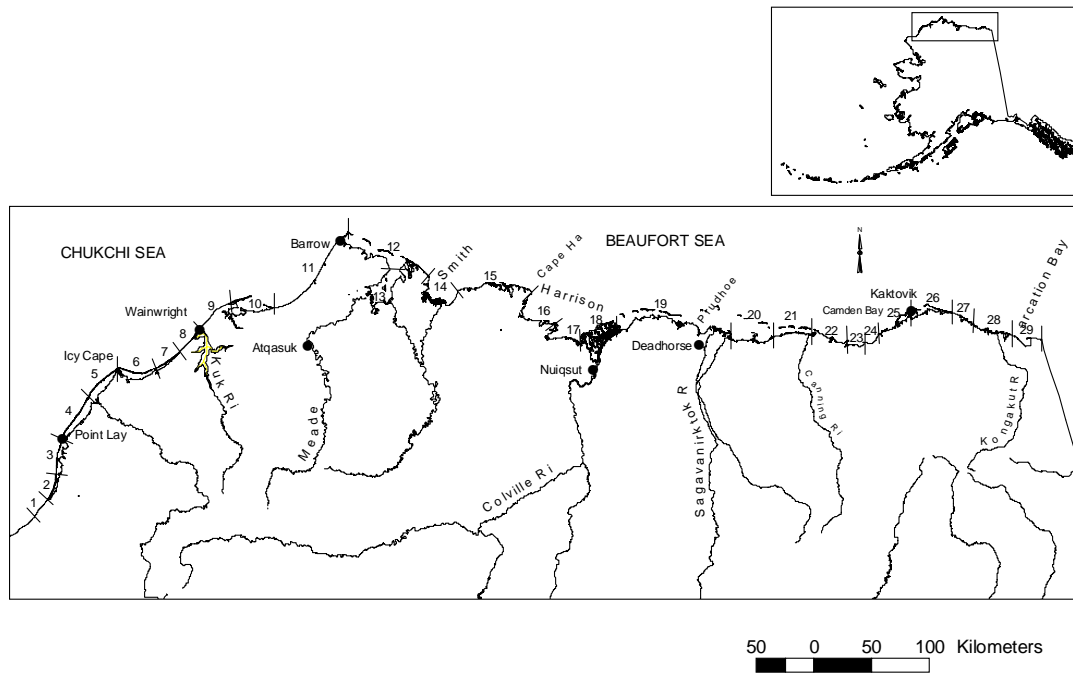


Fig. 1. Location of aerial survey segments searched for common eiders along the Arctic Coast, Alaska

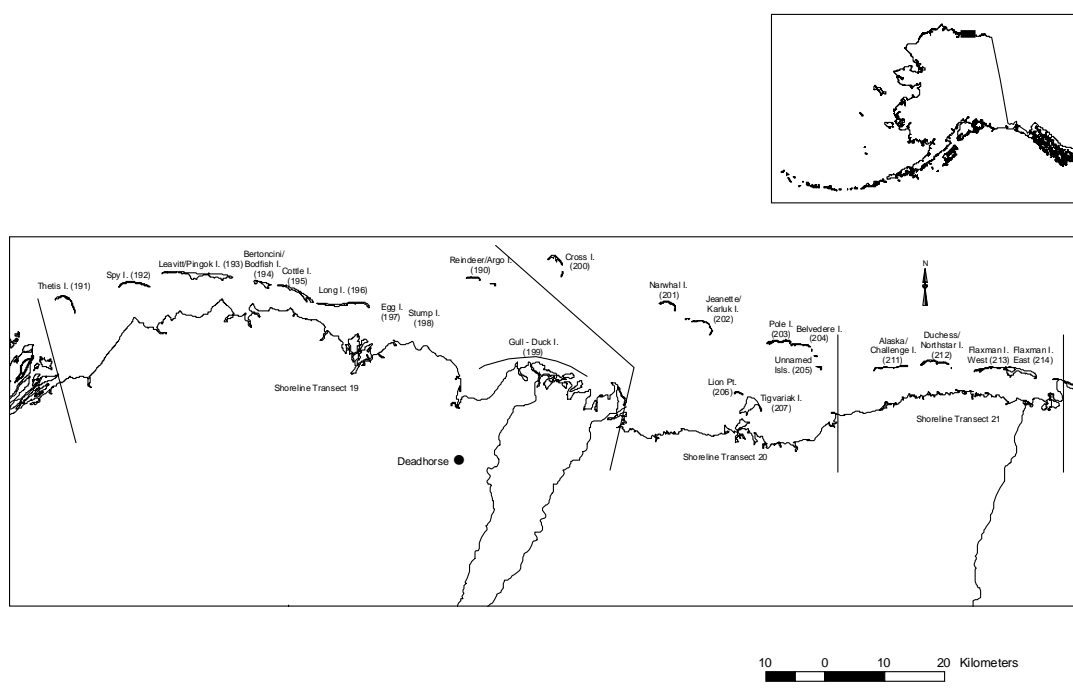


Fig. 2. Survey segments, including coastline and barrier islands, along the central Arctic Coastal Plain, Alaska.

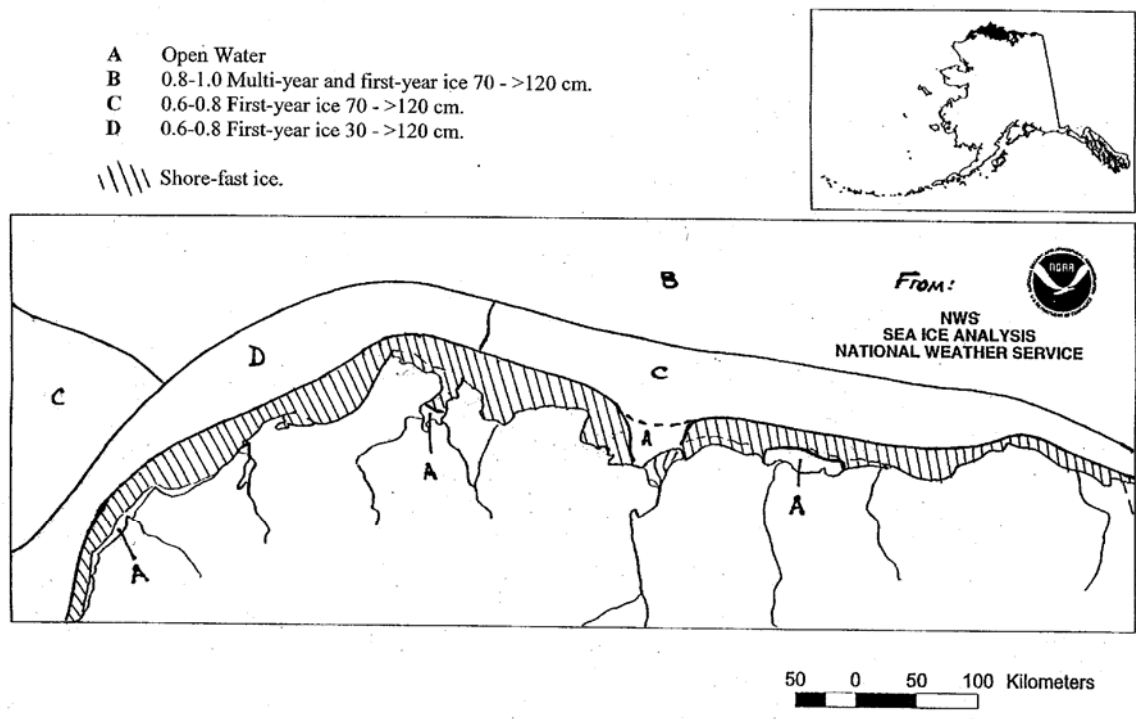


Figure 3. Sea ice conditions in late June along the Arctic Coastal Plain, 2006.

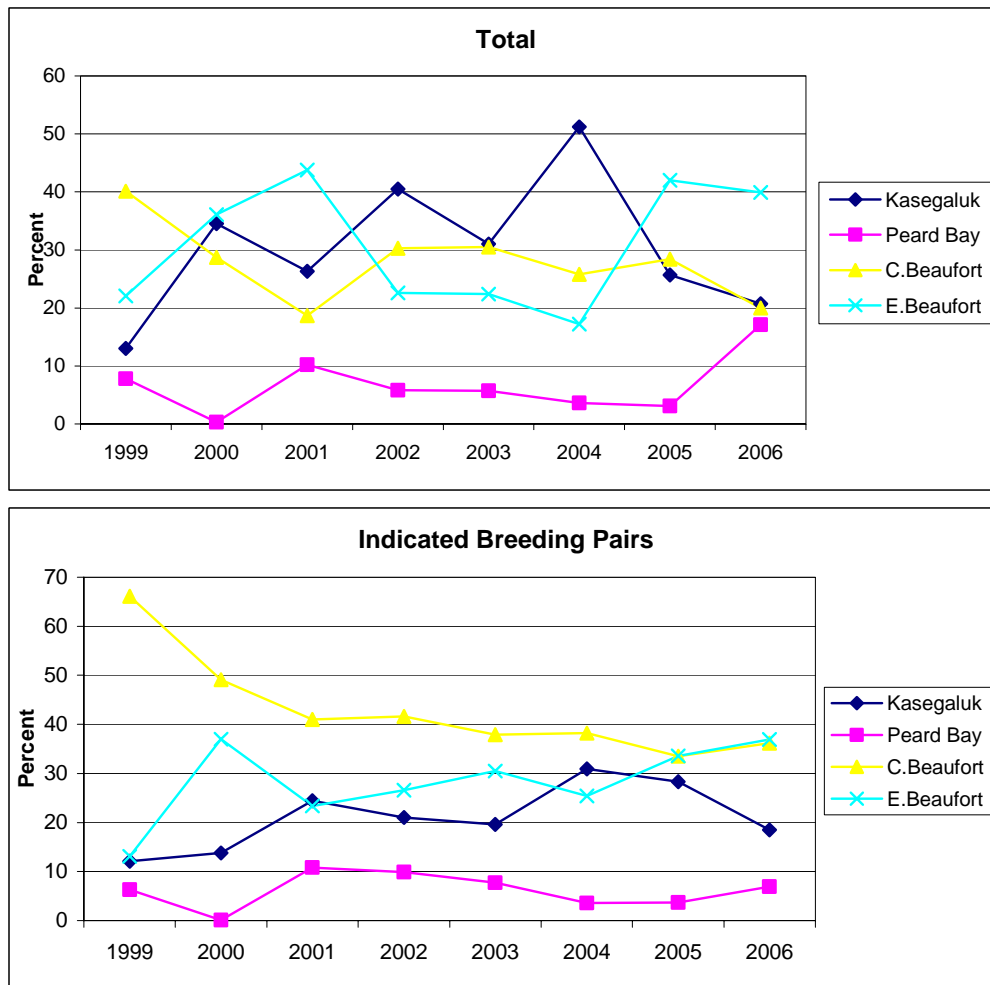


Figure 4. Trends in percent distribution of total and indicated breeding pairs of Common Eiders.

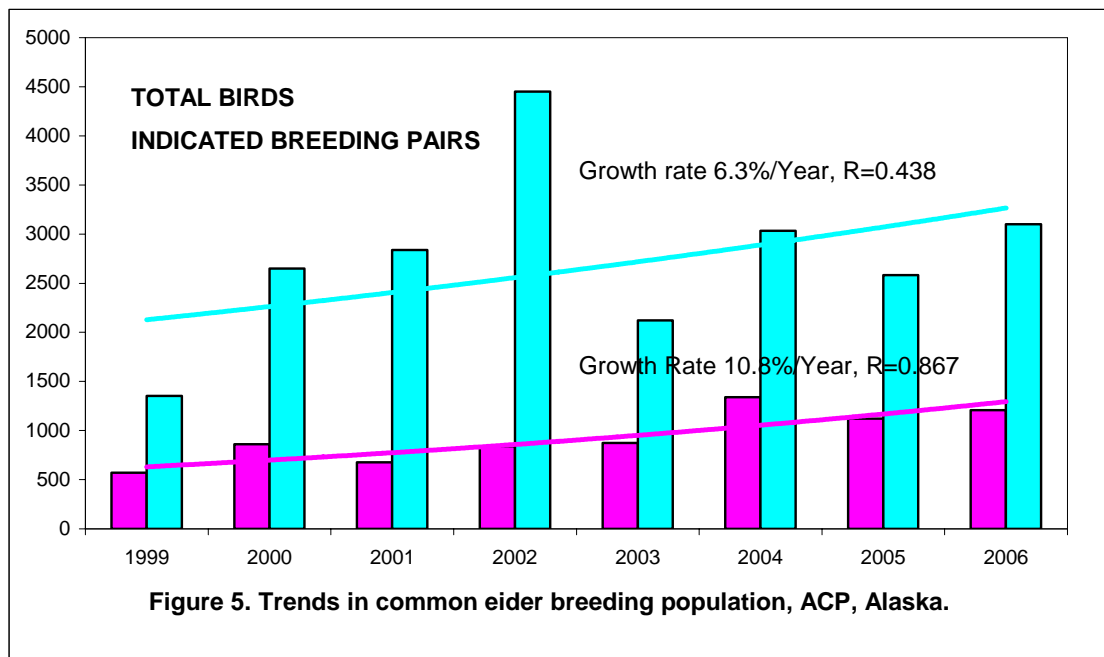


Table 1. Species totals by segment along barrier islands of the ACP, 25-27 June, 2006.

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			1	8		1					2	15						5	2	7			41		
BLBR							3			18										10		37	68		
CAGO																		7				22	29		
COEH ¹		2						1			1							1	4	1	7		17		
COEI		9	7	6		2	20	47	34	91	13	16	2	5	38	4	54	7	11	26		10	402		
COME										2													2		
GLGU		1	3	5	2	10	11	12	60	133	20	1	4		6	5	2	2	6	13	1		297		
GRSC		207		7													35						249		
GWFG				6		1																	7		
KIEI		4	31	7	6		4		11	19		9					2					2	95		
LSGO										670													670		
LTDU		121	3	21	5	8				46	40	10		57			176		69	15		3	574		
NOPI				10																			10		
PALO		1	2	11	1	6		1		10							5	2	3	5			47		
RBME				6	6	2		2		12		2						8		3		8	49		
RTLO				1	2					1								1					5		
SAGU					4						6			10				3					23		
SMSH ²					4																		4		
SNOW																						1	1		
SUSC																	45					10	55		
TUSW				2														2				2	6		
YBLO				1			1																2		

¹ COEH = common eider hens in singles and flocks.

² SMSH = small shorebird

Table 2. Species totals by segment along ACP mainland shoreline, 25-27 June, 2006.

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	181	
AGWT																	3														3	
ARTE	10	2	35	165	8	50	10			10		55			6	1												11	3	366		
BLBR		76	35	153	364	132	2	105		75	30	227	446	66	33	104	624	237	262	18	27	8			45			25		80	3174	
BLGU												3																			3	
BLKI						10																									10	
BLSC		19												10																	29	
CAGO												5		30	897	241	70	19	6	27	10	14			6	15		12	10	1362		
CEJV ²																			2					12		5					19	
COEH ¹				3		5	4			17								1	6	19	23	1	14	20	37			5	4	159		
COEI	19	45	69	96	99	229	92	11		514	25	4		3	6	2			42	53	78	276	14	160	106	277		197	88	2505		
COLO																							1				2			2	5	
COME																				6	4	3	12		4	25				9	63	
EIHE ¹																	3													2	5	
GLGU	10	48	26	108	40	34	38	12	25	43	43	128	70	57	38	37	14	6	148	162	26	42	30	8	132	276	16	32	32	10	1691	
GOEA			1																									1			2	
GRSC	6	11	6				6						50	345		5				20	12	40		18	40	25		25	47	656		
GWFG	39	12	17	85	3	44	4			10		3	44	29	42	188	343	588	258	44	11				70	94	5	33	33	534	2533	
GYRF															1																1	
HEGU	1									1																					2	
JAEG				1	1							2				1															5	
KEJV ²																							1								1	
KIEH ¹			8								2		4		3	8	3		9	8	9	6		5		1		6		72		
KIEI	10	2	2	7	9	79	9	3		1225	245	155		17	37	29	63	1	216	60	64	621		20		36	2	59		1	2972	
LSGO		1	28				1							16	4		5	33	207	72										23	390	
LTDU	108	65	47	225	16	24	1220	15	1	615	565	319	43	35	114	25	23	8	470	55	28	92	44	52	163	865	171	426	1358	10	7202	
LTJA								1																							1	
NOPI	5	215	18	121	2	21					1	46	58	383	28	166	50	5	219	8	3				4	114		34	80	60	1641	
NSHO		8																													8	
PAJA		1										3	1	3		3					3			1		1				3	19	
PALO	68	41	24	49	6	41	122	44	1	104	421	27	7	29	26	28	2	3	54	7	15	18	1	5	17	30	8	13	10	4	1225	
POJA				1	1		1			2			1											1						3	10	
RBME	22	21	5	3		22	7			9			3	2	7					28	12	6	26	26	21	4	292	1	46	21	584	
RLHA																						1									1	
RTLO	24	6	14	56	17	8	19	3		3	11	21	11	2	1	3				12	4	4	1			8		2	8	8	2	248
SAGU												140	10					6	30									1			187	
SMSH ³		202				20						1									1										224	
SNOW	2	4		1		3	2	3	3		13	4	19	23	11	11	5		6		4	1		1							116	
SPEH ¹		1									6																				7	
SPEI				25	15	6	2	2	1	7	36	3	1	6	1			1											2		108	
STEI				2								2	1																		5	
SUSC	26	4			10	100						152			50					1620	85	8	12		1475	495	389	376	250	484	5536	
TUSW		9	28		1	8			2		3		6	3	2		12	42	13	2		1			4			31	2	5	174	
WWSC											10				5						2		146	10	108	424	10	234	1670	1156	3775	
YBLO	3		2	1		26	31	1		7	5	1	12	1			1		3				2				1				97	

¹ COEH, KIEH, SPEH = common, king and spectacled eider hens in singles and flocks (EIHE = unidentified eider hen).² CEJV, KIJV = common and king eider juveniles.³ SMSH = small shorebird.

Table 3. Total birds for all areas, ACP coastline, 25-27 June 2006.

Species	Mainland	Barrier Isl.	Total
AGWT	3		3
ARTE	366	41	407
BLBR	3174	68	3242
BLGU	3		3
BLKI	10		10
BLSC	29		29
CAGO	1362	29	1391
CEJV ²	19		19
COEH ¹	159	17	176
COEI	2505	402	2907
COLO	5		5
COME	63	2	65
GLGU	1691	297	1988
GOEA	2		2
GRBE	1		1
GRSC	656	249	905
GTRF	1		1
GWFG	2533	7	2540
HASE	6		6
HEGU	2		2
JAEG	5		5
KEJV ²	1		1
KIEH ¹	72		72
KIEI	2975	95	3070
LSGO	390	670	1060
LTDU	7202	574	7776
LTJA	1		1
NOPI	1641	10	1651
NSHO	8		8
LTDU	3759		3759
PAJA	19		19
PALO	1225	47	1272
POJA	10		10
RBME	584	49	633
RLHA	1		1
RTLO	248	5	253
SAGU	187	23	210
SMSH	224	4	228
SNOW	116	1	117
SPEH ¹	7		7
SPEI	108		108
STEI	5		5
SUSC	5536	55	5591
TUSW	174	6	180
WWSC	3775		3775
YBLO	97	2	99

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

² CEJV, KEJV = common and king eider juveniles.

Table 4a. Common eider sex and age composition and totals in shoreline segments, ACP, 2006.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED ³
	Adult Male	Female	No.	Indicated Total ¹		Total	Male:Dark Birds ²	
1	2		1	3		15		19
2			9	9		27	12:15	45
3	7		6	13		50		69
4	28	3	24	52		20		99
5	12		22	34		43		99
6	13	5	58	71		100		234
7	28	4	27	44		10		96
8	7		2	9				11
9								0
10	31	17	52	83		379	40:40	531
11	2		1	3		21	1:4	25
12			2	2				4
13								0
14	1		1	2				3
15						6		6
16			1	1				2
17								0
18								0
19	18	1	12	30	2			45
20	29	6	9	38		6		59
21	14	19	32	46				97
22	62	23	44	106		126	23:3	299
23	2	1	6	8				15
24	55	14	28	83	12	49	21:28	186
25	21	20	27	48		31	15:16	126
26	39	37	58	97	5	122	45:40	319
27								0
28	19	5	39	58		100	5:5	202
29	27	4	18	45		25	4:6	92
181								0

¹ Single males+pairs = Indicated total pairs.

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

³ Total observed = singles+2x pairs+ juveniles+ flocks.

Table 4b. Common eider sex and age composition and totals in barrier island segments, ACP, 2006.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED ³
	Adult Male	Female	No.	Indicated Total ¹		Total	Male:Dark Birds ²	
190								0
191	1	2	4	5				11
192	5		1	6				7
193						6	5:1	6
194								0
195			1	1				2
196	12		4	16				20
197	35	1	6	41				48
198	20		7	27				34
199	67		12	79				91
200	7	1	3	10				14
201	12		2	14				16
202			1	1				2
203	3		1	4				5
204	36		1	37				38
205			2	2				4
206	31		9	40		5		54
207	5	1	1	6				8
211	7	4	2	9				15
212	12	1	7	19				27
213		7						7
214	2		4	6				10

¹ Single males+pairs = Indicated total pairs.

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

³ Total observed = singles+2x pairs+ juveniles+ flocks.

Table 5. Proportional distribution of totals and indicated pairs of common eiders along the ACP, 1999-2006

AREA (Segment No.)	1999 (%)		2000 (%)		2001 (%)		2002 (%)		2003 (%)		2004 (%)		2005 (%)		2006 (%)	
	Total	Pairs	Total	Pairs	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)	664 (25.7)	317 (28.3)	642 (20.7)	223 (18.5)
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)	81 (3.1)	42 (3.7)	531 (17.1)	83 (6.9)
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)	733 (28.4)	375 (33.5)	620 (20.0)	437 (36.2)
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)	1084 (42.0)	377 (33.6)	1239 (39.9)	445 (36.9)
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)	19 (0.7)	10 (0.90)	70 (2.3)	19 (1.6)
TOTALS	1353	572	2649	863	2837	676	4449	841	2123	874	3033	1340	2581	1121	3102	1207

Table 6. Species totals for all areas, ACP, 1999-2006.

Species	Total Birds Observed							
	1999	2000	2001	2002	2003	2004	2005	2006
AGWT	0	0	0	6	0	0	0	3
AMWI	0	0	0	0	0	10	2	0
ARTE	901	127	1530	241	671	1628	654	407
BLBR	2329	1411	2215	1319	2656	3836	1843	3242
BLGU	1	8	18	9	823	4	1	3
BLKI	0	0	29	92	0	15	3	10
BLSC	3	0	0	546	0	14	35	29
CAGO	1554	659	465	425	823	577	794	1391
CEJV ¹	18	8	10	0	0	30	2	19
COEH ²	92	330	295	215	114	88	60	176
COEI ³	1243	2311	2532	4234	2009	2915	2519	2907
COLO	0	0	1	0	2	0	2	5
COMU	0	0	0	40	0	0	0	0
COME	0	0	4	0	0	0	0	65
CORA	0	0	1	2	2	1	0	0
EIHE ²	0	0	0	0	0	0	0	5
GOEA	0	0	0	0	0	0	0	1
GLGU	4462	3345	5499	2703	7031	5478	3959	1988
GRSC	1011	944	744	99	495	408	602	905
GWFG	521	1269	623	425	255	1411	454	2540
GYRF	0	0	0	0	0	1	0	1
HEGU	0	0	0	0	0	0	0	2
JAEG	0	12	0	0	1	4	0	5
KEJV ¹	0	0	0	0	0	1	0	1
KIEH ²	9	61	48	146	35	37	24	72
KIEI	892	427	1716	10719	5334	2327	1013	3067
LGSH	0	0	0	0	7	0	2	0
LSGO	124	986	192	164	454	468	774	1060
LTJA	1	3	0	0	1	5	0	1
LTDU	4890	5726	5544	5110	9724	3527	3972	7776
MEGU	0	0	8	21	0	0	0	0
MESH ⁴	0	0	62	0	0	0	0	0
NOFU	0	0	0	1	0	0	0	0
NOPI	1268	779	2752	516	879	751	553	1651
NSHO	0	0	0	0	0	0	0	8
PAJA	4	9	81	7	10	3	5	19
PALO	443	429	208	537	325	315	166	1272
POJA	0	3	0	0	4	0	0	10
RBME	710	1985	194	108	265	643	495	633
RLHA	0	0	0	0	0	0	0	1
RTLO	85	198	154	64	233	159	81	253
SACR	2	2	2	2	1	0	0	0
SAGU	99	4	442	20	185	106	83	210
SMSH ⁴	0	3	0	0	0	4	8	228
SNOW	14	0	1	6	4	0	15	117
SPEH ²	2	0	0	0	0	1	0	7
SPEI	11	15	45	14	8	13	18	108
STEI	0	0	2	1	0	0	0	5
STEH ²	0	0	0	0	0	0	6	0
SUSC	2073	11113	2644	1500	5764	1543	3220	5591
TUNE ⁵	9	0	0	1	1	0	0	0
TUSW	32	84	30	269	49	50	83	180
WWSC	128	765	1622	1485	931	1159	1235	3775
YBLO	40	51	40	34	48	91	23	99

¹ CEJV, KEJV = COEI and KIEI juveniles in singles and flocks.² COEH, KIEH, SPEH, STEH = common, king, spectacled or Steller's eider hens in singles and flocks (EIHE = unidentified eider hen).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
2005	998	743	468	275	1.7:1
2006	1159	329	171	158	1.1:1

¹ Brown Birds = Females and Subadults.

² Adult Male:Brown Birds.