

**Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 22-24 June 2007**

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## SUMMARY

The ninth 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 22 to 24 June 2007. 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. Little shorefast ice was present in the Chukchi Sea during the survey, similar to conditions observed in 2006. Beaufort Sea ice cover was shorefast except near river mouths which were mostly ice free. Sea ice was broken and covered with melt indicating rapid disintegration.

A total of 1,936 common eiders, including 676 indicated breeding pairs (pairs+single drakes), were observed in 2007. Total observed and indicated breeding pairs were down 37.6 and 44.0 percent from 2006 and down 30.0 and 27.8 percent, respectively, from the long-term averages (1999-2006). Despite the decline from 2006, the population trend from 1999-2007 is positive. Total common eiders and indicated breeding pairs are increasing at annual rates of 2.2 and 5.4 percent, respectively. In 2007, indices were lower, the relative proportion of total birds and indicated breeding pairs increased everywhere except along the eastern Beaufort Sea coast in comparison to 2006 (Dau and Larned 2006). Other primary waterbird species observed and their change in numbers from 1999-2006 averages were: long-tailed duck 3,449 (-40.4%), glaucous gull 2,077 (-51.8%), greater white-fronted goose 1,703 (+81.8%), surf scoter 1,190 (-71.5%), Pacific brant 2,254 (-4.3%), king eider 1,677 (-48.3%), Canada goose 293 (-65.0%), lesser snow goose 2,279 (+331.6%), greater scaup 840 (+29.0%), and northern pintail 1,366 (+11.9%). Yellow-billed loons (n=46) decreased 13.2 percent from the 1999-2006 average of 53 birds.

## INTRODUCTION

This report summarizes the ninth 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, 2006). 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 100 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 into laptop computers using remote microphones. A custom record program interfaced with the aircraft Global Positioning System (GPS), geo-referenced observations (J. Hodges, USFWS-MBM, Juneau [retired]). The survey area extended up to 1.6 km seaward of terrestrial habitats (i.e. mainland, peninsula and barrier island shorelines) when open water existed. Occasional deviations were made to include larger flocks detected up to 3 km offshore. Flight routes followed shorelines and included all island, peninsula, bay and lagoon habitats as well as near shore waters. Flight tracks were periodically checked on laptop computers using moving map programs to help ensure complete survey area coverage.

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 provide a total observed population size (singles+2x pairs+birds in flocks) and the number of indicated breeding pairs (Tables 4 and 5). We assumed single male common eiders represented breeding pairs with females undetected on nests. Single males were not doubled to estimate population size and they were summed with the number of observed pairs to provide an estimate of indicated breeding pairs.

## 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 ice free. Kasegaluk Lagoon from Point Lay to midway in Segment 5 was ice free with 50 % ice cover for the remainder of Segment 5 north to Icy Cape. Icy Cape to Nokotlek Point was 60-80 % ice covered and remainder of the north portion of Kasegaluk Lagoon was ice free. From Icy Cape to the north end of Kasegaluk Lagoon there was approximately 200 m of shorefast ice with none south

of Icy Cape. There was approximately 800 m of shorefast ice off Peard Bay, otherwise the shoreline north to Point Barrow was open or lined with brash. Offshore waters to approximately 8 km had 0-50% coverage of broken/floating ice. All sea and lagoon ice had abundant surface ponding and 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, there was little patchy fog and winds were calm to 12 knots SSW. Temperatures were 42 to 45°F.

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

Dease Inlet (Segment 13) and the western portion of Segment 14 to Cape Simpson were not surveyed due to reduced visibility. Shorefast ice was continuous north of spits and barrier islands of Elson Lagoon 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 half 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 had 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 continuous 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. There was no snow cover in these segments or areas to the east. Survey conditions were good with high overcast to broken ceilings and occasional moderate glare. Winds were initially SW 8 knots becoming NW 10 knots. Temperatures increased from 50° to 55°F.

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

There was open water from the mid-Colville Delta north to 4 km south of Thetis Island and east to the Spy Island-Oliktok Point line. Simpson Lagoon east to the Long Island-Beechey Point line was ice covered with surface melt. Gwydyr Bay east to West Dock was 50% ice covered. The lagoon was 90% covered with ice with surface melt east to Milne Point decreasing to 50% at Kavearak Point with 1.6 km open water near shore. The lagoon was ice free from Beechey Point to West Dock. Continuous ice, with 0-30 m of open water near shore, was present north of barrier islands (Thetis to Long and Stump). Open water was present north of Egg Island. Prudhoe Bay had open water south of a line from West Dock to the Niakuk Islands with melt covered ice to the north. From Niakuk Islands east to the Endicott Causeway there was 150-200 m open water nearshore and otherwise continuous ice with surface melt east to Tigvariak Island. Midway Islands had 30 m open water to the north and 30-100 m to the south with continuous ice beyond. Cross Island was surrounded by shorefast ice. The remainder of Stefansson Sound from Mikkelsen Bay east to Brownlow Point had shorefast ice with surface melt. Barrier islands from the McClure to Flaxman groups had 0-30 m open water to the north and 10-450 m to the south. Survey conditions were good with minimal glare, high scattered to overcast ceilings and NE winds of 5-8 knots. Temperatures were 35-40°F.

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

Weather prevented surveying the east half of Segment 22 and all of segments 23 and 29. The lagoon from Brownlow Point to the Canning River mouth was ice free except for 50 m of shorefast ice along the south shore. There was 20 m open water north of the spit and barrier islands. Little, discontinuous shorefast ice was present from Collison Point to Anderson Point but visibility was obscured seaward. Arey Lagoon west of Okpilak River and east to Barter Island was ice free with from 250-1600 m open water to the north of barrier islands. Kaktovik Lagoon was 95% ice covered with surface melt. Jago Lagoon was 20% ice covered with surface melt, Tapkaurak Lagoon was ice free and Oruktaalik Lagoon had 50% ice cover with surface melt. Pokok Lagoon and Pokok Bay were 75% and 90% ice covered, respectively. Angun Lagoon had 50% ice cover with surface melt versus 25% for Beaufort Lagoon. There was 50-100 m open water north of barrier islands and shorelines east from Barter Island. Survey conditions were fair with fog occasionally obscuring visibility. Otherwise, ceilings were overcast with NNE winds of 12 knots. Temperatures were 40-45°F throughout the day.

## RESULTS/DISCUSSION

A total of 1,936 common eiders, including 676 indicated breeding pairs, were observed (Tables 4a-b and 5). Total birds and indicated breeding pairs were down 37.6 and 44.0 percent, respectively, from 2006 counts of 3,102 birds and 1,207 pairs. Total birds and indicated breeding pairs in 2007 were down 30.0 and 27.8 percent, respectively, from the 1999-2006 averages of  $2,766 \pm 885$  (1SD, range 1,353-4,449) birds and  $937 \pm 264$  (1SD, range 572-1,340) pairs. Although overall total birds and pairs of common eiders declined in 2007, relative proportions increased in all primary areas except along the eastern Beaufort Sea coast (Table 5, Figure 4). Increasing trends in numbers of both total birds (2.2%/yr) and indicated breeding pairs (5.4%/yr) have been documented with inter-annual numbers or pairs being least variable (Figure 5). The population decline observed in 2007 is partially due to all or parts of segments omitted due to adverse weather (i.e. segments 13, 14, 22, 23 and 29). However, the 1999-2006 average estimate of 240 birds for the areas missed suggests a relatively small impact on total estimated population size in 2007.

Flocked birds in 2007 totaled 902 (46.6% of total), which is a proportional increase in comparison to 2006 (1,159 birds, 37.4% of total). Number and composition of common eider flocks indicates adult males have predominated in eight of nine years (Table 7). No subadult male were observed in 2007 versus nineteen (0.6% of total observations) in 2006, 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 delay or “short-stop” Canadian migrants during some years. However, our subjective observations of ice conditions are all within 10 km of shore and we are unable to determine the presence of leads further offshore and to what extent common eiders may use them.

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 appeared stable through 2006 with a considerable decline in 2007 (Table 5, 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 in relation to nesting conditions, quantify effects on 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. Subjective estimates of the amounts of driftwood (i.e. none, low, moderate, high) have been obtained for central Beaufort Sea barrier islands as part of this survey (C. Dau, unpublished). At eighteen islands measured in 2007, driftwood amounts increased 20.8 percent overall (i.e. increase on 11 islands, decrease on two and no change on five) in relation to observations from 1999-2006. Storm surges, wind and tide erode vegetation and annually alter the amount of available driftwood which in turn affects the suitability of breeding sites to nesting common eiders. Our observations suggest better than average nesting conditions for common eiders in 2007, indexed solely by the relative amounts of drift.

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) Encourage the collection of ground survey data of birds and nests to aid in refining survey timing and potentially provide air:ground visibility indices.
- 3) Continue to explore ocular and photographic techniques to index nesting conditions (i.e. the amount and distribution of driftwood).

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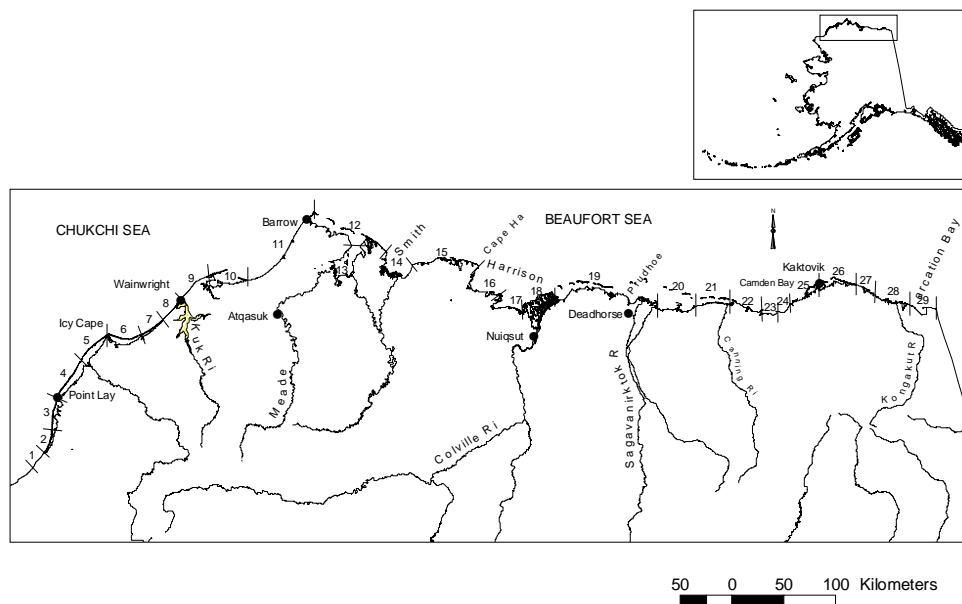


Fig. 1. Location of aerial survey segments searched for common eiders along the Arctic Coast, Alaska

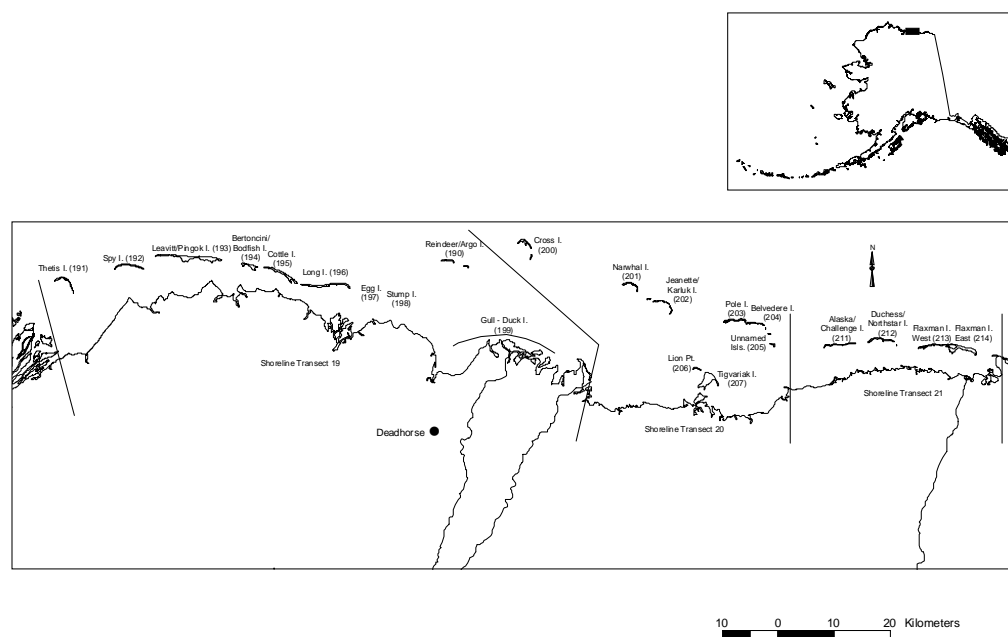


Fig. 2. Survey segments, including coastline and barrier islands, along the central Arctic Coastal Plain, Alaska.



- |                               |  |
|-------------------------------|--|
| <b>A</b> Open Water           | <b>E</b> 0.6-0.8, 36->120 cm.            |
| <b>B</b> 0.2-0.4, 0-70 cm.    | <b>F</b> 0.6-0.8, 0-70 cm.               |
| <b>C</b> 0.4-0.6, 0-120 cm.   | <b>G</b> 0.6-0.8, 0-120 cm.              |
| <b>D</b> 0.5-0.7, 36->120 cm. | <b>H</b> 0.8-1.0, 70->120 cm, Multiyear. |
- ////// Shore-fast Ice

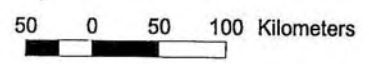
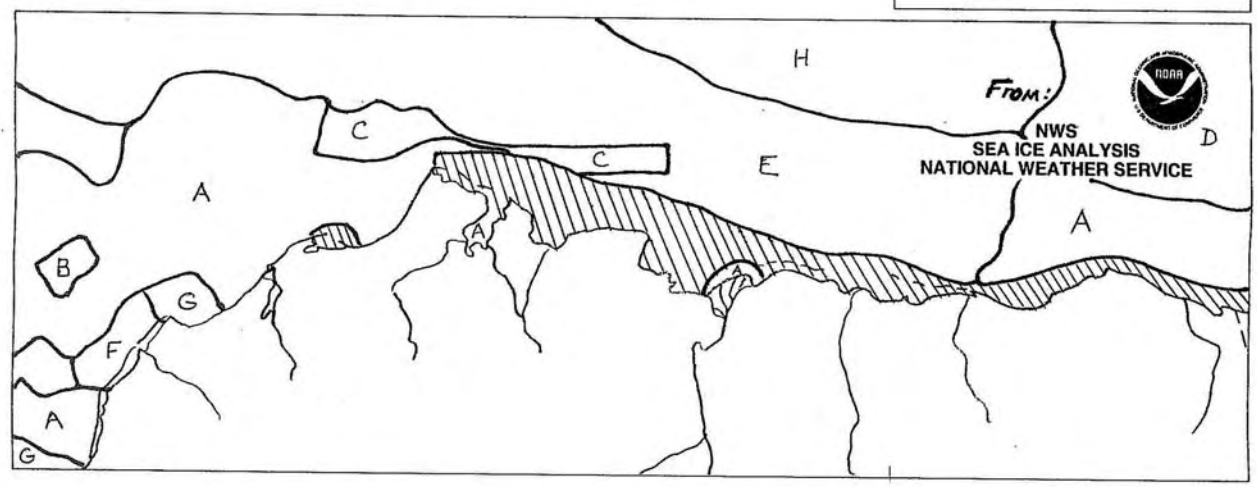
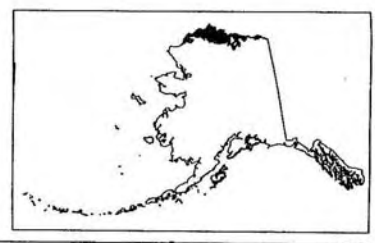


Figure 3. Sea ice conditions in late June along the Arctic Coastal Plain, 2007.

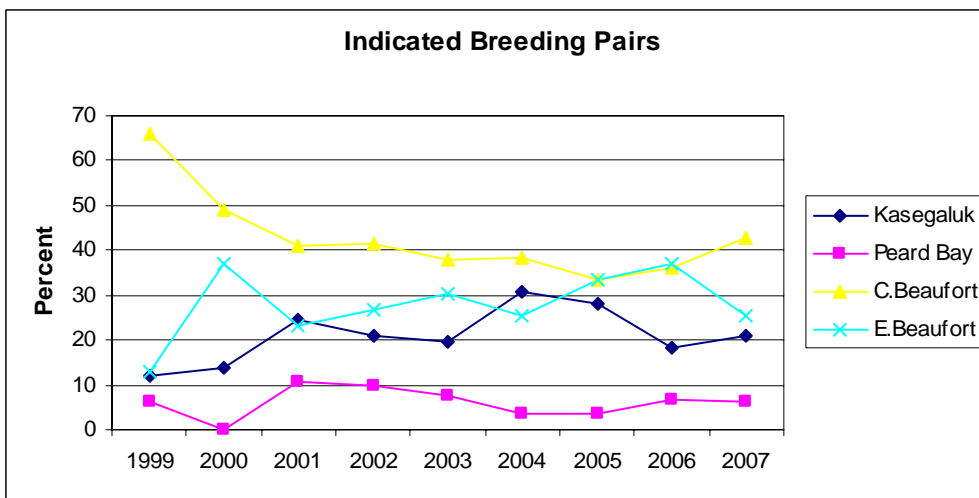
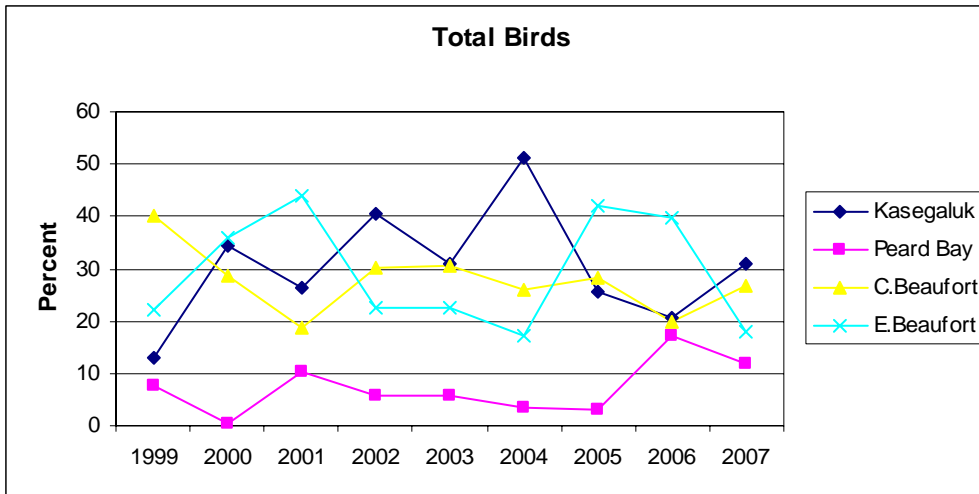


Figure 4. Trends in percent distribution of total and indicated breeding pairs of Common Eiders

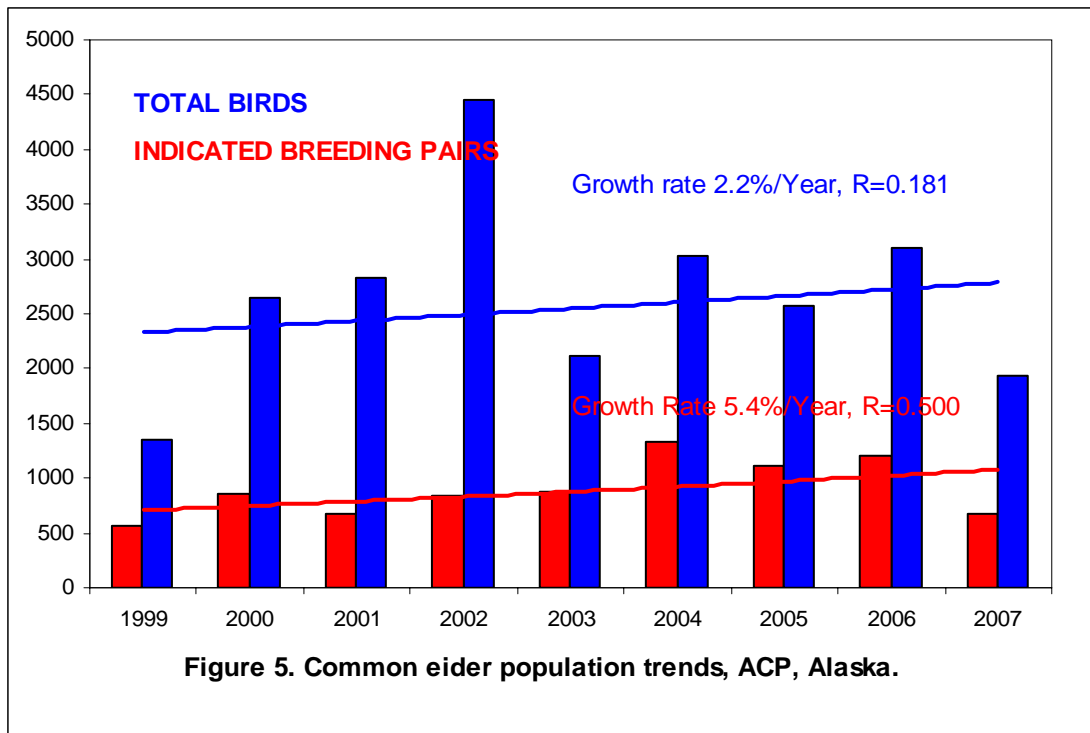


Table 1. Species totals by segment along barrier islands of the ACP, 22-24 June, 2007.

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				6									1		8				1	19			<b>35</b>
BLBR								6	11											25			<b>42</b>
CAGO																		3					<b>3</b>
COEH <sup>1</sup>				1		2																	<b>3</b>
COEI	31	4	9	6		18	18	37	132	8	19	19		5	11	1	25	1	17	54	2	3	<b>420</b>
COME									1														<b>1</b>
GLGU	7	5	12	3	3	9	4	9	98	50	18	3	1	4	1	1	5		4	37	3	1	<b>278</b>
GWFG				81	31													2				2	<b>116</b>
KIEI	6			2	3		8	3									22		2	10			<b>56</b>
LESG									18	1570									90				<b>1678</b>
LTDU		5		1				1	5			2		68	10		20	8	10	132		20	<b>282</b>
NOPI									25	18								2				10	<b>55</b>
PAJA				1																			<b>1</b>
PALO	1		1	4	8	4		4	3						4		7			3	1	1	<b>41</b>
RBME	2		2		2	4																	<b>10</b>
RTLO		2		1		2			5						1								<b>11</b>
SUSC	45								70														<b>115</b>
TUSW									15										2				<b>17</b>
YBLO								1															<b>1</b>

<sup>1</sup> COEH = common eider hens in singles and flocks.

Table 2. Species totals by segment along ACP mainland shoreline, 22-24 June, 2007.

Species	Segment Number																												Total
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	19	20	21	22	23	24	25	26	27	28	181		
AMWI	5																											<b>5</b>	
ARTE	6	103	53	115	38	4	231			30		73		2														<b>655</b>	
BLBR		58	40	138	232	1244	3			235		75	6		40	110	10	1					20					<b>2212</b>	
BLSC	2			8																								<b>10</b>	
CAGO													181	75	19	4	2									8	1	<b>290</b>	
COEH <sup>1</sup>			1		10	1			7								1				10	18	7					<b>56</b>	
COEI		43	34	87	140	262	17		95	223	144	1		4	1		1	88	6	2	28	169	98	12	2		<b>1457</b>		
COME												3																<b>3</b>	
GLGU	33	29	62	267	71	68	21	65	66	70	21	41	33	17	26	10	65	151	7	5			171	457	4	1	38	<b>1799</b>	
COGO		1																										<b>1</b>	
GRSC		68	40	350								275		1			1					45				60		<b>840</b>	
GWFG	302	224	134		27	20	3	8		2	3	7	5	154	111	150	238	29				32	25	47		66	<b>1587</b>		
KIEH <sup>1</sup>		3														8		2										<b>13</b>	
KIEI		2	45	16	79	3			393	85	751			19	29	87	16	67	11	3				2			<b>1608</b>		
LESG			230				15					13					105	210					3			25	<b>601</b>		
LTDU	74	106	20	40	90	1011	42	9	59	764	178	160	131	147	39		2	25	8	20	143	73	24		2	<b>3167</b>			
NOPI	12	470	90	56		110	31			106	25		89	6	3	38	114	10								151	<b>1311</b>		
PAJA		32	1										2														<b>35</b>		
PALO		16	4	4	8	28	28	1	17	177	20	9	12	28	11	6	17	10	3	1		5	5	7	1	2	<b>420</b>		
POJA																									2		<b>2</b>		
RBME	1	14	1		50	2		10										6				3	50		20	2	<b>159</b>		
RLHA													1														<b>1</b>		
RTLO	1	2	7	3	1	8	5		5		1	55	4	3			2						6	2	1		<b>106</b>		
SAGU			1		1						67						92										<b>161</b>		
SNOW													2														<b>2</b>		
SPEI				2		6			4																		<b>12</b>		
STEI									2																		<b>2</b>		
SUSC		52	225		12	10	8		10									20				20	110	283	170	155	<b>1075</b>		
TUSW			1		5	16		6						3	1		10	14								2	<b>58</b>		
UNEI <sup>1</sup>					150																						<b>150</b>		
WWSC						3					22											40			22	7	<b>94</b>		

<sup>1</sup> COEH, KIEH = common and king eider hens in singles and flocks (UNEI = unidentified eider).

Table 3. Total birds for all areas, ACP coastline, 22-24 June 2007.

Species	Mainland	Barrier Isl.	Total
AMWI	5		<b>5</b>
ARTE	655	35	<b>690</b>
BLBR	2212	42	<b>2254</b>
BLSC	10		<b>10</b>
CAGO	290	3	<b>293</b>
COEH <sup>1</sup>	56	3	<b>59</b>
COEI	1457	420	<b>1877</b>
COGO	1		<b>1</b>
COME	3	1	<b>4</b>
GLGU	1799	278	<b>2077</b>
GRSC	840		<b>840</b>
GWFG	1587	116	<b>1703</b>
KIEH <sup>1</sup>	13		<b>13</b>
KIEI	1608	56	<b>1664</b>
LSGO	1678	601	<b>2279</b>
LTDU	3167	282	<b>3449</b>
NOPI	1311	55	<b>1366</b>
PAJA	35	1	<b>36</b>
PALO	420	41	<b>461</b>
POJA	2		<b>2</b>
RBME	159	10	<b>169</b>
RLHA	1		<b>1</b>
RTLO	106	11	<b>117</b>
SAGU	161		<b>161</b>
SNOW	2		<b>2</b>
SPEI	12		<b>12</b>
STEI	2		<b>2</b>
SUSC	1075	115	<b>1190</b>
TUSW	58	17	<b>75</b>
UNEI <sup>2</sup>	150		<b>150</b>
WWSC	94		<b>94</b>
YBLO		1	<b>1</b>

<sup>1</sup> COEH, KIEH = common and king eider hens in singles and flocks.

<sup>2</sup> UNEI = unidentified eider.

Table 4a. Common eider sex and age composition and totals in shoreline segments, ACP, 2007.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED <sup>3</sup>
	Adult Male	Female	No.	Indicated Total <sup>1</sup>		Total	Male:Dark Birds <sup>2</sup>	
1								0
2			1	1		41		43
3	5	1	7	12		15		35
4	19		25	44		18	12:6	87
5	4	1	18	22		100	60:40	141
6	24	10	29	53		180	64:61	272
7	3	1	7	10				18
8								0
9	10		5	15		75	38:37	95
10	14	7	28	42		153	85:60	230
11	8		3	11		130	7:8	144
12	1			1				1
13								NS
14								0
15			2	2				4
16	1			1				1
17								0
18								NS
19	1			1				1
20	41	1	7	48		33	16:10	89
21			3	3				6
22	2			2				2
23								0
24	14	10	7	21				38
25	39	18	45	84		40	28:12	187
26	22	7	33	55		10	5:5	105
27	8		2	10				12
28			1	1				2
29								NS
181								0

<sup>1</sup> Single males+pairs = Indicated total pairs.<sup>2</sup> Flocks from which sex ratios were obtained. Dark birds = females and subadults.<sup>3</sup> Total observed = singles+2x pairs+ juveniles+ flocks.

Table 4b. Common eider sex and age composition and totals in barrier island segments, ACP, 2007.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED <sup>3</sup>
	Adult Male	Female	No.	Indicated Total <sup>1</sup>		Total	Male:Dark Birds <sup>2</sup>	
190	2		2	4		25		31
191	2		1	3				4
192	7		1	8				9
193		1	3	3				7
194								0
195		2	9	9				20
196	12		3	15				18
197	19		9	28				37
198	63		12	75		45		132
199	8			8				8
200	9		5	14				19
201	1		9	10				19
202								0
203	3		1	4				5
204	3		4	7				11
205	1			1				1
206						25	12:13	25
207	1			1				1
211	1		2	3		12	6:6	17
212	28		13	41				54
213			1	1				2
214	1		1	2				3

<sup>1</sup> Single males+pairs = Indicated total pairs.

<sup>2</sup> Flocks from which sex ratios were obtained. Dark birds = females and subadults.

<sup>3</sup> Total observed = singles+2x pairs+ juveniles+ flocks.

Table 5. Proportional distribution of totals and indicated pairs of common eiders along the ACP, 1999-2007.

AREA (Segment No.)	1999 (%)		2000 (%)		2001 (%)		2002 (%)		2003 (%)		2004 (%)		2005 (%)		2006 (%)		2007 (%)	
	Total	Pairs	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)	596 (30.8)	142 (21.0)
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)	230 (11.9)	42 (6.2)
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)	519 (26.8)	289 (42.8)
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)	346 (17.9)	173 (25.6)
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)	245 (12.7)	30 (4.4)
TOTALS	1353	572	2649	863	2837	676	4449	841	2123	874	3033	1340	2581	1121	3102	1207	1936	676



Table 6. Species totals for all areas, ACP, 1999-2007.

Species	Total Birds Observed								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
AGWT	0	0	0	6	0	0	0	3	0
AMWI	0	0	0	0	0	10	2	0	5
ARTE	901	127	1530	241	671	1628	654	407	690
BLBR	2329	1411	2215	1319	2656	3836	1843	3242	2254
BLGU	1	8	18	9	823	4	1	3	0
BLKI	0	0	29	92	0	15	3	10	0
BLSC	3	0	0	546	0	14	35	29	10
CAGO	1554	659	465	425	823	577	794	1391	293
CEJV <sup>1</sup>	18	8	10	0	0	30	2	19	0
COEH <sup>2</sup>	92	330	295	215	114	88	60	176	59
COEI <sup>3</sup>	1243	2311	2532	4234	2009	2915	2519	2907	1877
COGO	0	0	0	0	0	0	0	0	1
COLO	0	0	1	0	2	0	2	5	0
COMU	0	0	0	40	0	0	0	0	0
COME	0	0	4	0	0	0	0	65	4
CORA	0	0	1	2	2	1	0	0	0
EIHE <sup>2</sup>	0	0	0	0	0	0	0	5	0
GOEA	0	0	0	0	0	0	0	1	0
GLGU	4462	3345	5499	2703	7031	5478	3959	1988	2077
GRSC	1011	944	744	99	495	408	602	905	840
GWFG	521	1269	623	425	255	1411	454	2540	1703
GYRF	0	0	0	0	0	1	0	1	0
HEGU	0	0	0	0	0	0	0	2	0
JAEG	0	12	0	0	1	4	0	5	0
KEJV <sup>1</sup>	0	0	0	0	0	1	0	1	0
KIEH <sup>2</sup>	9	61	48	146	35	37	24	72	13
KIEI	892	427	1716	10719	5334	2327	1013	3067	1664
LGSH	0	0	0	0	7	0	2	0	0
LSGO	124	986	192	164	454	468	774	1060	2279
LTJA	1	3	0	0	1	5	0	1	0
LTDU	4890	5726	5544	5110	9724	3527	3972	7776	3449
MEGU	0	0	8	21	0	0	0	0	0
MESH <sup>4</sup>	0	0	62	0	0	0	0	0	0
NOFU	0	0	0	1	0	0	0	0	0
NOPI	1268	779	2752	516	879	751	553	1651	1366
NSHO	0	0	0	0	0	0	0	8	0
PAJA	4	9	81	7	10	3	5	19	36
PALO	443	429	208	537	325	315	166	1272	461
POJA	0	3	0	0	4	0	0	10	2
RBME	710	1985	194	108	265	643	495	633	169
RLHA	0	0	0	0	0	0	0	1	1
RTLO	85	198	154	64	233	159	81	253	117
SACR	2	2	2	2	1	0	0	0	0
SAGU	99	4	442	20	185	106	83	210	161
SMSH <sup>4</sup>	0	3	0	0	0	4	8	228	0
SNOW	14	0	1	6	4	0	15	117	2
SPEH <sup>2</sup>	2	0	0	0	0	1	0	7	0
SPEI	11	15	45	14	8	13	18	108	12
STEI	0	0	2	1	0	0	0	5	2
STEH <sup>2</sup>	0	0	0	0	0	0	6	0	0
SUSC	2073	11113	2644	1500	5764	1543	3220	5591	1190

Table 6 (continued). Species totals for all areas, ACP, 1999-2007.

Species	Total Birds Observed								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
TUNE <sup>5</sup>	9	0	0	1	1	0	0	0	0
TUSW	32	84	30	269	49	50	83	180	75
UNEI <sup>6</sup>	0	0	0	0	0	0	0	0	150
WWSC	128	765	1622	1485	931	1159	1235	3775	94
YBLO	40	51	40	34	48	91	23	99	46

<sup>1</sup> CEJV, KEJV = COEI and KIEI juveniles in singles and flocks.  
(EIHE = unidentified eider hen).

<sup>3</sup> COEI = single adult males and birds in pairs and flocks.

<sup>4</sup> MESH = medium shorebird; SMSH = small shorebird.

<sup>5</sup> TUNE = tundra swan nest.

<sup>6</sup> UNEI= unidentified eider.

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

Year	Flock Total	Total Classified	Adult Males	Brown Birds <sup>1</sup>	Ratio <sup>2</sup>
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
2007	902	591	333	258	1.3:1

<sup>1</sup> Brown Birds = Females and Subadults.

<sup>2</sup> Adult Male:Brown Birds.