Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 1-5 July 2009

By

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SUMMARY

This report presents results of the 11th consecutive aerial survey of common eiders and other waterbirds along the coastline of the Arctic Coastal Plain (ACP) of Alaska. The survey included barrier islands and was conducted from 1 to 5 July 2009 using an amphibious Cessna 206 (N234JB) with a pilot/observer and right seat observer. The survey area encompasses approximately 1,050 linear kilometers of the Chukchi and Beaufort seas coastlines from Omalik Lagoon north and east to the Canadian border. Additional areas of barrier island and peninsular habitats were included near Kasegaluk Lagoon (190 linear kilometers) and from Point Barrow to Demarcation Bay (325 linear kilometers). Open water predominated in near shore marine habitats and overall ice cover was the least extensive yet observed (since 1999) along both the Chukchi and Beaufort seas coasts. Remnant near shore sea ice was deteriorating rapidly and covered with melt water.

A total of 1,931 common eiders, including 824 indicated breeding pairs (pairs + single adult males), were observed in 2009. Total observed and indicated breeding pairs were up 8.9 and down 14.2 percent, respectively, from 2008 and down 23.5 and 9.7 percent, respectively, from the long-term averages (1999-2008). Total numbers of common eiders have varied considerably indicating an annual decline of 1.4% while numbers of indicated breeding pairs have shown less variability, increasing at 3.0%/year. In 2009 versus 2008, total birds and indicated breeding pairs decreased in the highest density areas along the central and eastern Beaufort Sea coast and at Kasegaluk Lagoon, most dramatically in the latter area. Total birds and indicated breeding pairs increased along the eastern Beaufort Sea coast. Numbers of other primary waterbird species observed in 2009 were: long-tailed duck 7,128, glaucous gull 8,808, greater white-fronted goose 1,702, surf scoter 4,496, Pacific brant 2,766, king eider 787, Canada goose 1,485, lesser snow goose 1,224, greater scaup 990, and northern pintail 880. Number of yellow-billed loons observed in 2009 (n=59) was above average (1999-2008 avg. 49.0).

INTRODUCTION

This report summarizes the 11th consecutive year for this survey designed to estimate the number, population trend, demography, and distribution of breeding common eiders in coastal habitats of the Alaskan ACP (Dau and Taylor 2000a, 2000b, Dau and Anderson 2001, 2002, Dau and Hodges 2003, Dau and Larned 2004, 2005, 2006, 2007, 2008). The survey area extends 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). Ice conditions were described along the survey route as were conditions of nesting habitat (i.e. subjective estimate of the amount of driftwood and detritus) on peninsulas and barrier islands along the central Beaufort Sea coast.

METHODS

The survey is timed to coincide with egg laying and early incubation while pair bonds are intact and prior to the dispersal of males to molting sites (Johnson and Herter 1989). Observations were made from an amphibious Cessna 206 flown at approximately 100 knots (kts) and an altitude of 45 meters ASL/AGL by a pilot/observer (left side) and observer (right side). Remote microphones were used to enter observations into computers interfaced with the aircraft Global Positioning System (GPS). A custom record program geo-referenced the individual observations as they were entered (J. Hodges, USFWS, Juneau). 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 coverage of the survey area. When open water existed, survey coverage extended up to 1.6 km seaward of terrestrial habitats (i.e. mainland, peninsula and barrier island shorelines). Deviations farther offshore (i.e. $\leq$3 km) were made if birds were detected.

The survey area includes 30 mainland shoreline segments and 22 islands or island groups (Figs. 1 and 2). Dease Inlet (Segment 13) was not surveyed in 2009 or in recent years due to extensive ice cover and the consistent lack of common eiders. Likewise, only the outer area of the Colville River delta (segment 181) was surveyed in 2009 and in recent years. During the survey USGS maps (scale 1:250,000 and 1:63,360) were used to identify segment start and stop points. A panel mounted computer screen displaying 1:250,000 scale maps was also used. Observations on habitat, survey and ice conditions were made for each survey segment. Satellite images and graphic sea ice analyses prepared by the National Weather Service depicted broad scale ice cover during the survey (Figure 3).

Composition of common eider flocks were recorded by sex and age (i.e. adult or subadult). Flocks that could be identified as assemblages of pairs were recorded as individual pairs and sex ratio was recorded for other flocks. Observations of common eiders and other species were summarized by survey segment (Tables 1 and 2) and for the total survey area (Table 3). Species totals for 2009 in comparison to all years of the survey (1999-2009) are presented in Table 6. The distribution, sex and age composition and numbers of common eiders were recorded by survey segment and summarized to provide an estimate of total population size (singles + 2x pairs + birds in flocks) and the number of indicated breeding pairs (single males + pairs) (Tables 4a-b and 5). We assumed single male common eiders represented breeding pairs with females undetected at nests. Single males were not doubled to estimate population size because we also count numerous single females which are excluded in standardized USFWS pair surveys (USFWS and CWS 1987).

STUDY AREA/CONDITIONS

Physical descriptions of individual survey segments and the following groupings of segments are described by Dau and Taylor (2000). Ice conditions based on satellite

imagery and National Weather Service analyses along with observed conditions encountered during the survey in 2009 were:

Omalik Lagoon to Point Barrow (Segments 1-11)

Kasegaluk Lagoon (Segments 1-7) was ice free with the exception of scattered broken ice (≤ 10%) near Icy Cape. Peard Bay had 30% ice cover with surface melt and was open to 0.8 and 0.4 kms, respectively, along the south and west peninsula shorelines. Open water up to 1 km was present inside the Seahorse islands and the east peninsula. Shorefast and offshore ice was absent from Omalik Lagoon north to Utukok Pass (Segs 1-4). From Utukok Pass to Icy Cape there was 0.4 kms of broken ice over 50% of the area from the shore seaward with open water beyond. From Icy Cape north to Wainwright (Segments 6-8) there was no shorefast ice, 5% broken ice to 3 kms offshore and open water beyond. Shorefast ice, broken with surface melt, to 6.5 kms seaward along the southern half of segment 11 gradually decreased to no shorefast ice from 30 kms south of Point Barrow with open water beyond. No ice was present in lakes and the tundra was snow free. Survey conditions were excellent with ceilings and visibility unrestricted and northerly winds <10 kts. Temperatures ranged from 45-50^{o}F.

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

Shorefast ice persisted from Point Barrow to Cape Simpson (Segs 12 and 14) with mostly closed pack ice with surface melt to the north. The exception was Ekilukruak Entrance (Elson Lagoon) which was ice free with 3 kms of open water to the south. The central and western portions of Elson Lagoon had 95% coverage of ice with surface melt versus 50% in the eastern portion. Shorelines and near shore areas from Smith Bay to the west Colville River delta were ice free. Smith (Seg 15) and Harrison (Seg 16) bays were ≥80% ice covered with surface melt. Kogru Inlet was mostly ice free with 1-1.5 kms of patchy ice along the southern shore. There was no snow cover in any segments east of Point Barrow and all lakes with the exception of Teshekpuk Lake (≤50% ice cover) were ice free. Survey conditions were good with clear skies and good visibility. Winds and temperatures were northerly at 5-15 kts and 50^{o}F (2 July) and northerly 25 kts and 35^{o}F (4 July).

Colville River Delta to the Canning River Delta (Segments 19-21, 181, 190-214)

There was no ice offshore of the Colville River Delta (Seg 181) and Simpson Lagoon was ice free east to Beechey Point. Eastern Simpson Lagoon to Pt. McIntyre had 5-10% ice cover. Slight shoreline brash ice (10 m in width) north of Thetis Island (Seg 191) increased to 200 m in width at Spy Island (Seg 192) and along barrier islands east to Stump Island (Seg 198) with open water beyond. Prudhoe Bay was open south of Gull Island and to 15 kms north of the Niakuk islands. The Midway islands (Seg 190) and Cross Island (Seg 200) were ice free to the south and had broken ice to 3 kms north with open water beyond. Foggy Island Bay had continuous broken ice in the center with 2-6 km open along the delta of the Sagavanirtok River. From the mouth of the Kadleroshilik River east to Tigvariak Island (Seg 207) there was up to 12 kms of shorefast ice (70%

coverage). The remainder of the shoreline to Brownlow Point was ice free as was Stefansson Sound except for 5% ice cover in the far-east end. North of the McClure, Stockton, Maguire and Flaxman islands shorefast ice decreased east to west from 1.5 kms in width at Flaxman to none at Narwal Island (Seg 201). Survey conditions were good with high scattered ceilings and northeasterly winds of 10-15 knots. Temperatures ranged from 35-45^{o}F.

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

Lagoon areas from Brownlow Point to Konganevik Point (Seg 22) were ice free. North of barrier islands and peninsulas, shorefast ice extended to 200 m with broken ice to 3 kms and open water beyond. Camden Bay had 2% coverage of broken ice in the center with open water to $\geq$15 kms offshore. Arey, Kaktovik and Jago lagoons were ice free with little or no shorefast ice along barrier islands and peninsulas. A narrow band of broken ice was observed 5 kms offshore north of these lagoons in what was otherwise open water. Ice cover was 30% in Tapkaurak, Oruktalik, Angun and Beaufort lagoons and 50% in Pokok Lagoon (Segs 26-28). Along the exposed coastline there was 3 kms of shorefast ice in the east end of segment 26 and 200 m in segment 29 and absent elsewhere. Siku Lagoon and Demarcation Bay were ice free. Survey conditions were good with moderate glare, clear ceilings and northeasterly winds of 10 knots. Temperatures increased from 55-65^{o}F during the day.

RESULTS/DISCUSSION

A total of 1,931 common eiders, including an estimated 824 indicated breeding pairs, was observed in the survey area (Tables 4a-b and 5). Total birds increased by 8.9 percent and indicated breeding pairs decreased by 14.2 percent from 2008 (i.e. 1,774 birds and 960 pairs). Total birds and indicated breeding pairs in 2009 declined 23.5 and 9.7 percent, respectively, from the 1999-2008 averages of 2,584$\pm$871 (1SD, range 1,353-4,449) birds and 913$\pm$248 (1SD, range 572-1,340) pairs (Table 5, Figure 4). However, both total birds and indicated breeding pairs decreased in the highest density areas along the central and eastern Beaufort Sea coast and at Kasegaluk Lagoon, most dramatically in the latter area. Total birds and indicated breeding pairs increased along the eastern Beaufort Sea coast. Common eider numbers, while continuing to show considerable annual variation, have declined by 1.4%/year while number of indicated breeding pairs has showed less variability and is increasing at 3.0%/year (Figure 5). Totals for all species observed in 2009 in comparison to all years of the survey (1999-2009) are presented in Table 6.

Common eiders observed in flocks in 2009 (n=718, 37.2% of total) increased from 2008 (n=465, 46.6% of the total). Increases in total birds and those observed in flocks may indicate that some migrants destined for western Canadian breeding areas were present during this survey. Adult males have predominated in flocks during 8 of eleven years since this survey began in 1999 (Table 7). However, brown plumaged birds (adult and subadult females) have outnumbered males the past two years, most notably in 2009. Factors affecting trends in numbers and sex ratios of flocked birds are unclear but the extent of ice cover and the presence and distribution of offshore leads may affect

migratory phenology and the potential "short stopping" of common eiders along the ACP of Alaska. Only four subadult males were observed in 2009 (0.2% of total observations) versus none in 2007 and 2008. These birds were observed along the Chukchi Sea coast where most previous observations during this survey have been made.

The number of indicated breeding pairs of common eiders observed on this survey (increasing at 3.0%/year) is indicative of annual reproductive effort along the ACP of Alaska but number of total birds is variable due to migratory phenology and ice conditions (Table 5, Figures 4 and 5). Low productivity and recruitment of common eiders in recent years at some sites along the coast of the central Beaufort Sea suggests the population is probably supplemented by immigration or infrequent years of high recruitment (Flint et al. 2003).

Low elevation barrier islands and peninsulas are preferred nesting sites if driftwood and detritus deposited by storm surges is available to provide nest cover. Less commonly, small clumps of vegetation provide nest sites. Subjective estimates of driftwood quantities on central Beaufort Sea barrier islands have been collected opportunistically during this survey since 1999 (C. Dau file data). In 2009 21 island/island groups were evaluated for driftwood cover with increases on 4, decreases on 6 and no change at 11 sites. Overall, driftwood cover was light to moderate in 2009 and 2008 suggesting no occurrence of strong storm surge activity and comparable nesting conditions for common eiders.

RECOMMENDATIONS

1) Continue annual aerial survey to quantify and monitor the distribution, abundance, demographics, and habitat use of the Alaska ACP by common eiders. Distribution, abundance and demography may correspond to annual habitat conditions hence; continuation of this survey will help document long-term patterns of use.

2) Determine fidelity of individual pairs to breeding sites and if distribution varies annually, evaluate the effect of nesting conditions and quantify the effect on productivity.

3) Encourage the collection of ground survey data of birds and nests to aid in refining survey timing and potentially provide air:ground visibility indices.

4) Continue to explore ocular and photographic techniques (Anthony 1999) to index nesting conditions (i.e. the amount and distribution of driftwood).

5) Encourage the initiation of comparable breeding population surveys of common eiders within the range of the Pacific population in the Canadian Arctic.

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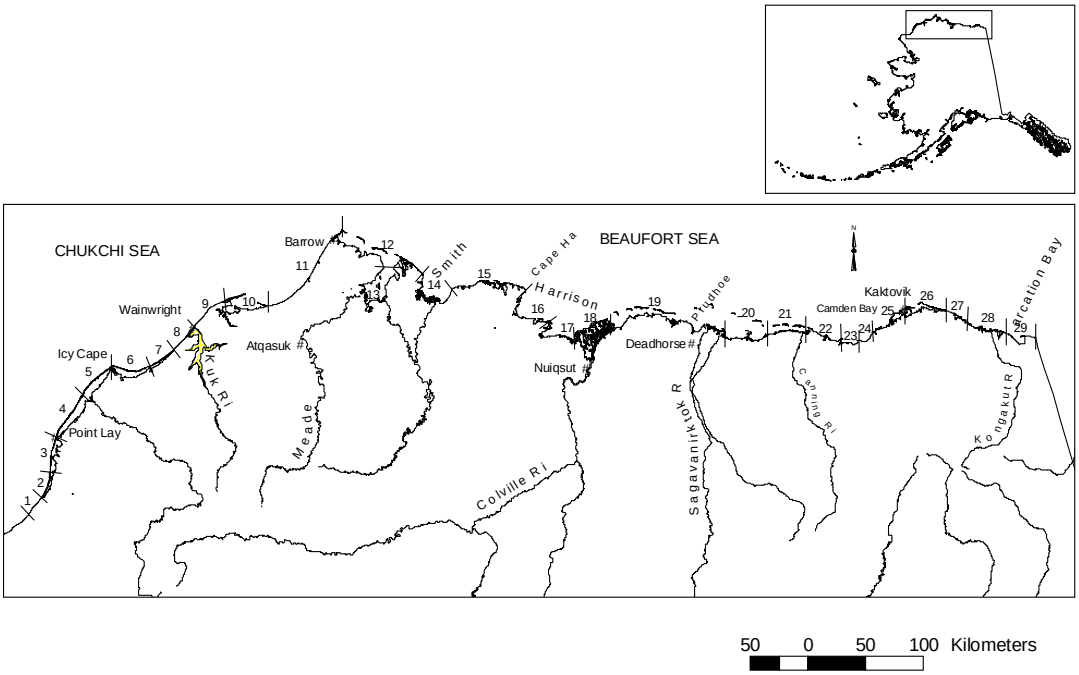

Fig. 1. Location of aerial survey segments searched for common eiders along the Arctic Coast, Alaska

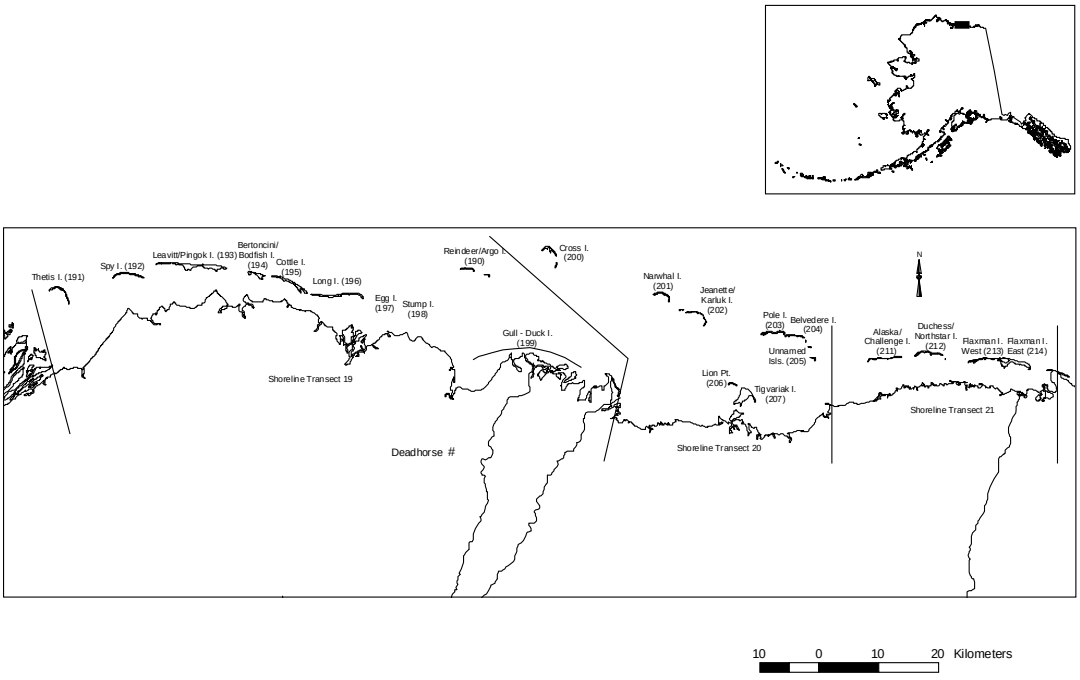

Fig. 2. Survey segments, including coastline and barrier islands, along the central Arctic Coastal Plain, Alaska.

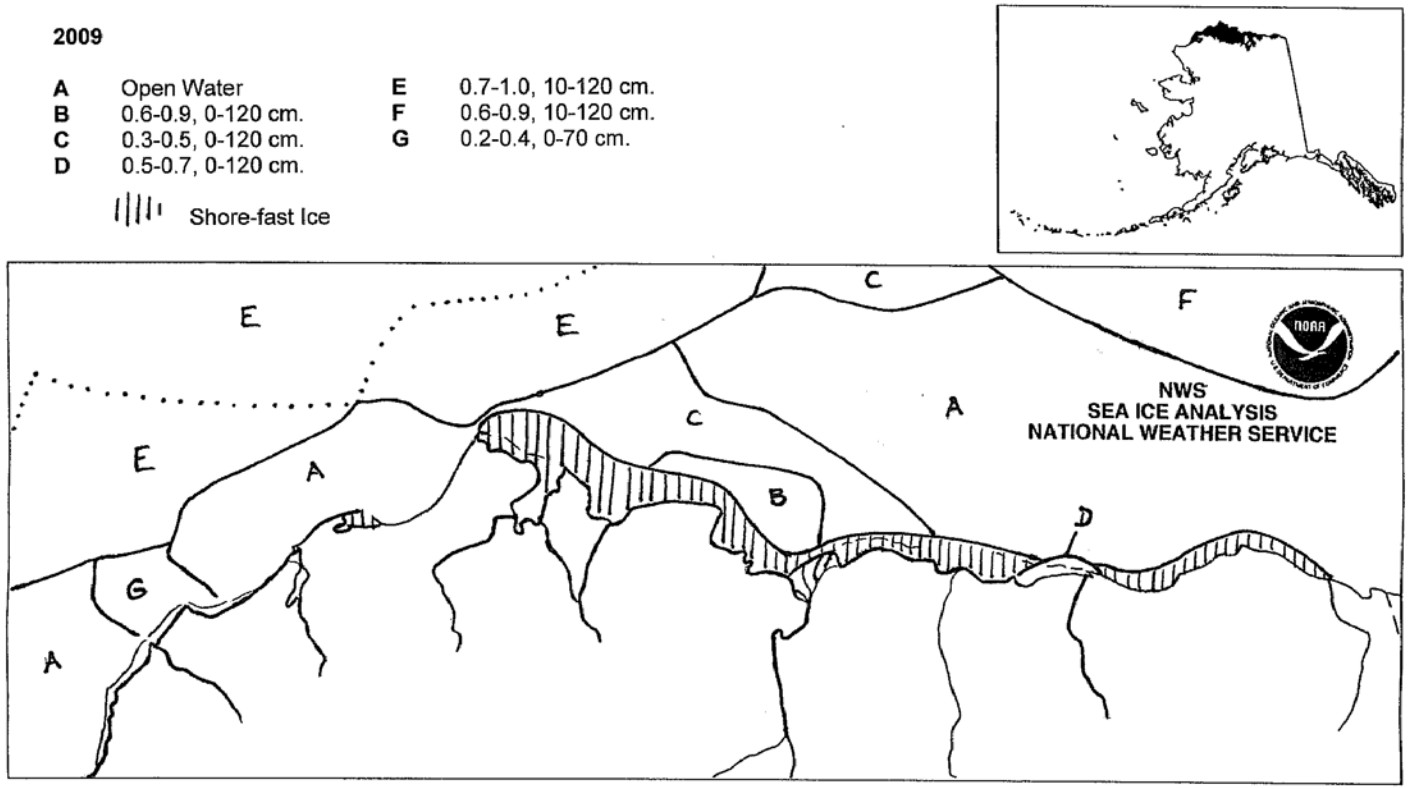

Figure 3. Sea ice conditions in late June along the Alaska Arctic Coastal Plain, 2009.

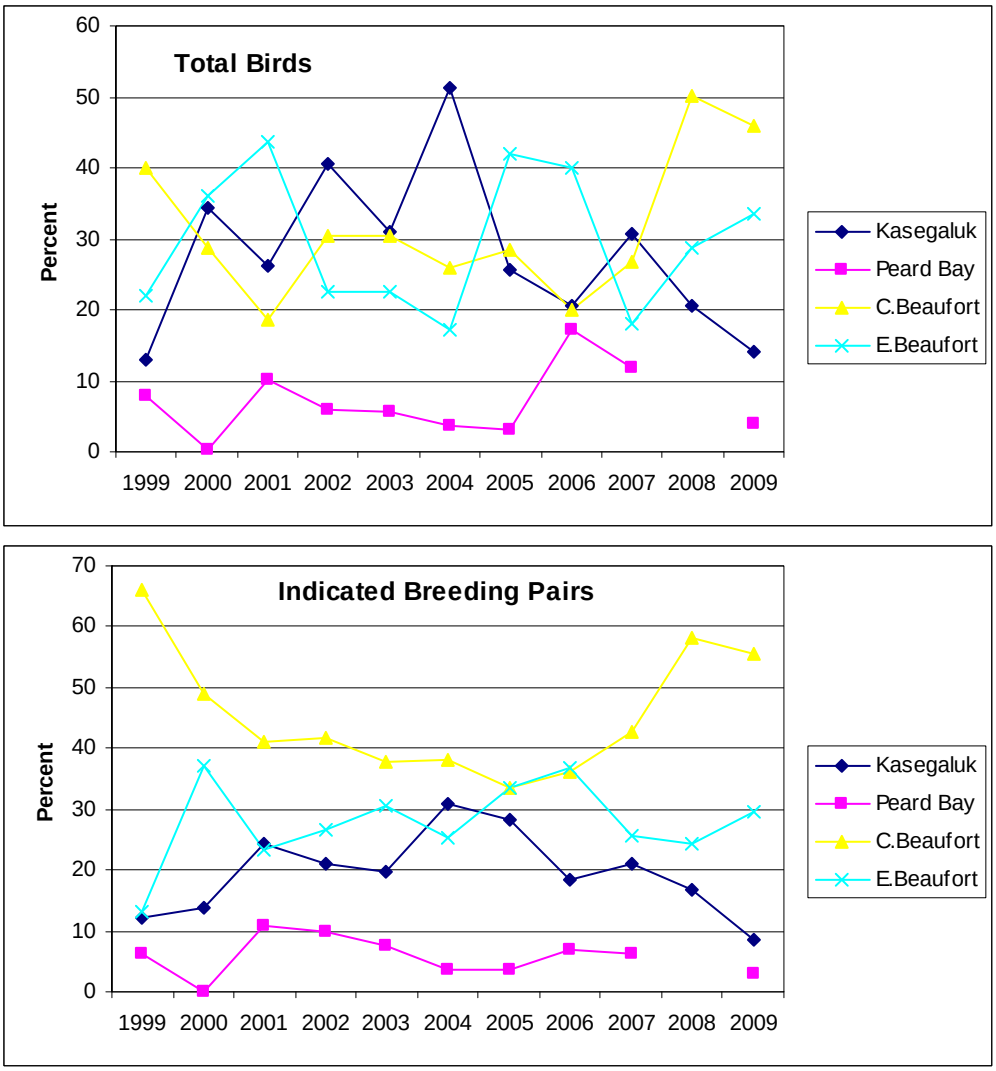

Figure 4. Trends in percent distribution of total Common Eiders and indicated breeding pairs by area along the Alaska ACP, 1999-2009.

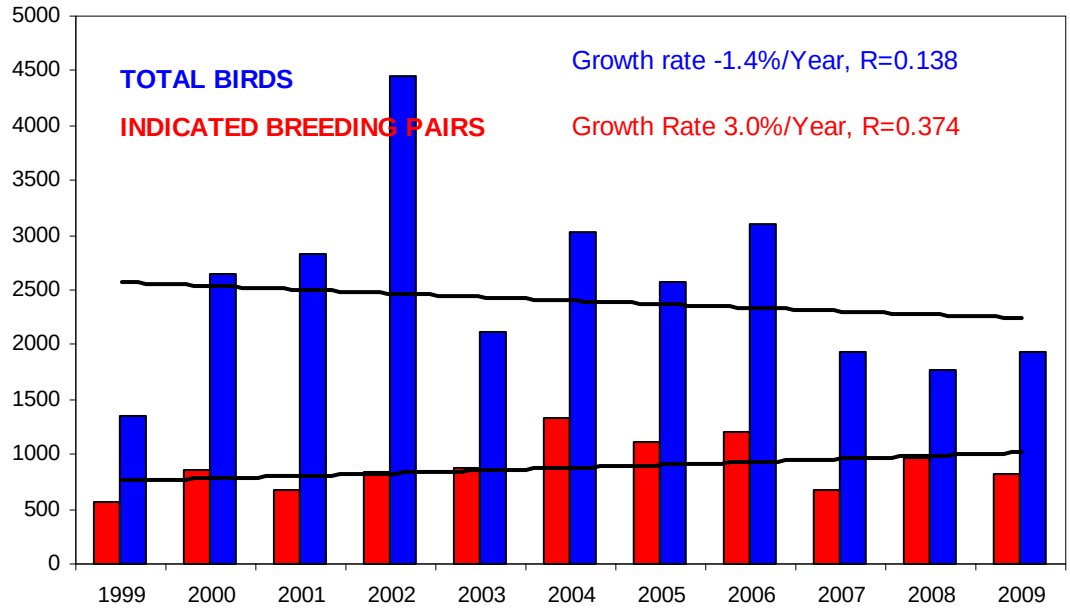

Figure 5. Common eider population trends, ACP, Alaska, 1999-2009.

Table 1. Species totals by segment along barrier islands of the ACP, 1-5 July, 2009.

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			26								3	6							3			**40**
BLBR					9																		**9**
CAGO																					2		**2**
COEH[1]			1	1	2			1	2	14	2	6	12		10		6	1	8	6	13		**85**
COEI	1	66	29	3	62	5		19	8	52	44	31	1		39		32		115	79	70	3	**659**
GLGU		19	28	93	264	4	1	5	35	49	3	6	4		11	4	5	51	20	51	11	26	**692**
GRSC		40				20																	**60**
GWFG				1	65																		**66**
KIEH					1										5				40				**46**
KIEI			44	2	6									25	40			1	58				**176**
LTDU		579	100	176	100	123	125	102		2	69	83	200	10	25		75	40	65	10	274	180	**2338**
NOPI						20				30													**50**
PALO									2		1			2			1	1	1				**8**
POJA																				1			**1**
RBME			4	8	4	1		20		30			7				12				52	5	**143**
RTLO			1																		2	3	**6**
SAGU				47	8					150	1		5		42					71			**324**
SNGO					5													418					**423**
SUSC											7	10						22	3		7		**49**
WWSC												1									8		**9**
YBLO																	1	2					**3**

[1] COEH = common eider hens in singles and flocks.

Table 2. Species totals by segment along ACP mainland shoreline, 1-5 July, 2009[1].

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	29	181	
ARTE	10	1	402	162	1407	74	39			184		199	18	3									2				52		**2553**
BLBR		40	36	229	774	4	32	150			20	191	29	20	160	435	152					10	39	3				433	**2757**
BLKI					10	1																							**11**
BLSC		8	1							12								12	15	450				60					**558**
CAGO					11							155	80	304	712	112	15		26	26	14	8	20						**1483**
CEJV				2			1																						**3**
COEH[2]		20	5	48	4	10	16	2		13	4	1					8	34	24	25	5	18	55	15	2	23	11		**343**
COEI		8	6	58	30	29	34			64	16	4	22	4			5	23	46	84	32	40	124	134		12	66		**841**
COME																				6			10	7	10				**33**
CORA		1																							11				**12**
GLGU	89	193	249	610	520	132	226	215	687	250	1186	553	86	126	35	140	250	204	662	195	302	191	402	176	37	122	240	38	**8116**
GRSC			120	2									170					150		20			28	280	60	80	20		**930**
GWFG	62	120	202	4				3			14	230	4	154	254	349	108	33										99	**1636**
HARD	1																												**1**
JAEG				1		2																				1			**4**
KIEH[2]							18	15		4					8	18		10	27	4	2	10	8			1			**125**
KIEI			2				24				14			4	217	4		6	132	21	6		9	1					**440**
LTDU	6	77	216	46	2	275	21	12	365	384	258	345		258	25		120	101	671	200	47	136	108	561	10	509	37		**4790**
NOPI		404	8	47		5						61			12	11		11			10	9	150	30		62		10	**830**
PAJA			3		3	1					1																		**8**
PALO	1	4	7	11	2		2	1	1	36	10	22		4	3		6	5	7	7	1		5	6	5	6	7		**159**
PECO		1		1																									**2**
POJA																							2		4				**6**
RBME	44	18	11	8		4					1	20	11	6	11		14	26	75	32	34	5	32	273	41	123	231		**1020**
RTLO	19	6	8	20	3					2		8	1	6				7	6	6			3	4	1	1	11		**112**
SAGU				33	1273	64	55			60	5	103																35	**1628**
SMSH																										2			**2**
SNGO		9	15										170		65		107	110	1	11								313	**801**
SNOW			6	17	11			4			1				2					2								3	**46**
SPEI				3																									**3**
SUSC		8										1		6			32	103	105	40	397	1710	453	1400		133	59		**4447**
TUSW		2			7	2						1	3	2	3						2			5	4	13	14	3	**61**
WWSC		6																2		1		50	20			29	22		**130**
YBLO	3		1	3	3		1		1	20	2	2		2	8		1	5		1			1	1		1			**56**

[1] Segments 13 and 18 not flown in 2009.
[2] COEH, KIEH = common and king eider hens in singles and flocks.

Table 3. Total birds for all areas, ACP coastline, 1-5 July 2009.

Species	Mainland	Barrier Isl.	**Total**
ARTE	2553	40	**2593**
BLBR	2757	9	**2766**
BLKI	11		**11**
BLSC	558		**558**
CAGO	1483	2	**1485**
CEJV	3		**3**
COEH[1]	343	85	**428**
COEI	841	659	**1500**
COME	33		**33**
CORA	12		**12**
GLGU	8116	692	**8808**
GRSC	930	60	**990**
GWFG	1636	66	**1702**
HARD	1		**1**
JAEG spp	4		**4**
KIEH[1]	125	46	**171**
KIEI	440	176	**616**
LAGU	21	0	**21**
LTDU	4790	2338	**7128**
NOPI	830	50	**880**
PAJA	8		**8**
PALO	159	8	**167**
PECO	2		**2**
POJA	6	1	**7**
RBME	1020	143	**1163**
RTLO	112	6	**118**
SAGU	1628	324	**1952**
SMSH	2		**2**
SNGO	801	423	**1224**
SNOW	46		**46**
SPEI	3		**3**
SUSC	4447	49	**4496**
TUSW	61		**61**
WWSC	130	9	**139**
YBLO	56	3	**59**

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

Table 4a. Common eider sex and age composition and totals in shoreline segments, ACP, 2009.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED[3]
	Adult Male	Female	No.	Indicated Total[1]		Total	Male:Dark Birds[2]	
1								0
2			4	4		20	0:20	28
3			3	3		5	0:5	11
4	1	5	9	10	2	82	27:55	108
5	2	2	14	16		2	0:2	34
6	17	2	6	23		8	0:8	39
7	12		3	15	1	32	6:26	51
8						2	0:2	2
9								0
10	9	3	16	25	1	32	5:27	77
11						20	1:19	20
12		1	2	2				5
14	22			22				22
15	4			4				4
16								0
17								0
19	1	1	2	3		7	0:7	13
20	1	1	11	12		33	0:33	57
21	2		22	24		24	0:24	70
22	26	5	11	37		56	30:26	109
23	14	1	5	19		12	1:11	37
24						58	12:46	58
25	60	3	29	89		58	2:56	179
26	38	3	29	67		50	9:41	149
27						2	0:2	2
28	4	3	4	8		20	0:20	35
29	10	2	13	23		39	1:38	77
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, 2009.

SEGMENT	SINGLES		PAIRS		JUVENILE MALES	FLOCKED BIRDS		TOTAL OBSERVED[3]
	Adult Male	Female	No.	Indicated Total[1]		Total	Male:Dark Birds[2]	
190	1			1				1
191	10		25	35		6	5:1	66
192	11	1	9	20				30
193	1	1	1	2				4
194	52		5	57		2	0:2	64
195	1		2	3				5
196								0
197	11	1	4	15				20
198	4		2	6		2	0:2	10
199	4	2	14	18		32	8:24	66
200	4	2	20	24				46
201	21	6	5	26				37
202	1		1	1		12	0:12	13
203								0
204	19	2	10	29		8	0:8	49
205								0
206	10	1	11	21		5	0:5	38
207		1						1
211	27	1	14	41		67	25:42	123
212	45	4	17	62		2	0:2	85
213	49	2	6	55		20	9:11	83
214	1		1	2				3

[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, 1999-2009.

AREA (Nos.)	1999 (%)		2000 (%)		2001 (%)		2002 (%)		2003 (%)		2004 (%)		2005 (%)		2006 (%)		2007 (%)		2008 [1] (%)		2009 (%)	
	Total	Pairs	Total	Pairs	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)	364 (20.5)	162 (16.9)	271 (14.0)	71 (8.6)
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)	No survey	No survey	77 (4.0)	25 (3.0)
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)	888 (50.1)	559 (58.2)	884 (45.8)	457 (55.5)
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)	509 (28.7)	234 (24.4)	646 (33.5)	243 (29.5)
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)	13 (0.7)	5 (<0.5)	53 (2.7)	28 (3.4)
TOTALS	1353	572	2649	863	2837	676	4449	841	2123	874	3033	1340	2581	1121	3102	1207	1936	676	1774	960	1931	824

[1] Segments 8-11, 18 not surveyed in 2008.

Table 6 (part). Species totals for all areas, ACP, 1999-2009.

	Total Birds Observed										
Species	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [7]	2009
AGWT	0	0	0	6	0	0	0	3	0	0	0
AMWI	0	0	0	0	0	10	2	0	5	0	0
ARTE	901	127	1530	241	671	1628	654	407	690	1252	2593
BLBR	2329	1411	2215	1319	2656	3836	1843	3242	2254	2669	2766
BLGU	1	8	18	9	823	4	1	3	0	15	0
BLKI	0	0	29	92	0	15	3	10	0	0	11
BLSC	3	0	0	546	0	14	35	29	10	0	558
CAGO	1554	659	465	425	823	577	794	1391	293	266	1485
CEJV[1]	18	8	10	0	0	30	2	19	0	0	3
COEH[2]	92	330	295	215	114	88	60	176	59	31	428
COEI[3]	1243	2311	2532	4234	2009	2915	2519	2907	1877	1743	1500
COGO	0	0	0	0	0	0	0	0	1	0	0
COLO	0	0	1	0	2	0	2	5	0	0	0
COMU	0	0	0	40	0	0	0	0	0	0	0
COME	0	0	4	0	0	0	0	65	4	13	33
CORA	0	0	1	2	2	1	0	0	0	3	12
EIHE[2]	0	0	0	0	0	0	0	5	0	0	0
GOEA	0	0	0	0	0	0	0	1	0	0	0
GLGU	4462	3345	5499	2703	7031	5478	3959	1988	2077	2601	8808
GRSC	1011	944	744	99	495	408	602	905	840	483	990
GWFG	521	1269	623	425	255	1411	454	2540	1703	1107	1702
GYRF	0	0	0	0	0	1	0	1	0	1	0
HARD	0	0	0	0	0	0	0	0	0	0	1
HEGU	0	0	0	0	0	0	0	2	0	0	0
JAEG	0	12	0	0	1	4	0	5	0	0	4
KEJV[1]	0	0	0	0	0	1	0	1	0	0	0
KIEH[2]	9	61	48	146	35	37	24	72	13	10	171
KIEI	892	427	1716	10719	5334	2327	1013	3067	1664	2279	616
LGSH	0	0	0	0	7	0	2	0	0	0	0
LSGO	124	986	192	164	454	468	774	1060	2279	2145	1224
LTJA	1	3	0	0	1	5	0	1	0	0	0
LTDU	4890	5726	5544	5110	9724	3527	3972	7776	3449	2249	7128
MEGU	0	0	8	21	0	0	0	0	0	0	0
MESH[4]	0	0	62	0	0	0	0	0	0	0	0
NOFU	0	0	0	1	0	0	0	0	0	0	0
NOPI	1268	779	2752	516	879	751	553	1651	1366	1381	880
NSHO	0	0	0	0	0	0	0	8	0	0	0
PAJA	4	9	81	7	10	3	5	19	36	88	8
PALO	443	429	208	537	325	315	166	1272	461	98	167
PECO	0	0	0	0	0	0	0	0	0	0	2
POJA	0	3	0	0	4	0	0	10	2	8	7
RBME	710	1985	194	108	265	643	495	633	169	755	1163
RLHA	0	0	0	0	0	0	0	1	1	0	0
RTLO	85	198	154	64	233	159	81	253	117	90	118
SACR	2	2	2	2	1	0	0	0	0	0	0
SAGU	99	4	442	20	185	106	83	210	161	143	1952
SMSH[4]	0	3	0	0	0	4	8	228	0	21	2
SNOW	14	0	1	6	4	0	15	117	2	2	46

Table 6 (continued). Species totals for all areas, ACP, 1999-2009.

Species	Total Birds Observed										
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [7]	2009
SPEH[2]	2	0	0	0	0	1	0	7	0	0	0
SPEI	11	15	45	14	8	13	18	108	12	22	3
STEI	0	0	2	1	0	0	0	5	2	2	0
STEH[2]	0	0	0	0	0	0	6	0	0	0	0
SUSC	2073	11113	2644	1500	5764	1543	3220	5591	1190	3570	4496
TUNE[5]	9	0	0	1	1	0	0	0	0		0
TUSW	32	84	30	269	49	50	83	180	75	55	61
UNEI[6]	0	0	0	0	0	0	0	0	150	15	0
WWSC	128	765	1622	1485	931	1159	1235	3775	94	626	139
YBLO	40	51	40	34	48	91	23	99	46	18	59

[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.

[6] UNEI= unidentified large eider, USCO= unidentified scoter.

[7] Mainland segments 8-11, 18 not surveyed.

Table 7. Common eider flock composition, Alaska ACP, 1999-2009.

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
2007	902	591	333	258	1.3:1
2008	465	176	81	95	1:1.2
2009	718	718	141	577	1:4.1

[1] Brown Birds = Females and Subadults.

[2] Adult Male:Brown Birds.