

Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2007– (October 1, 2006 to Sept 30, 2007)

Project Title: No. 80. Surveys of Common Eiders in the Bathurst Inlet area of Nunavut. Year 2 of a 3 year study.

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Partners: Sea Duck Joint Venture; Canadian Wildlife Service; Polar Continental Shelf Project; Inuvialuit Wildlife Management Advisory Council

Project Description: The Bathurst Inlet area, including Melville Sound, Parry Bay and Elu Inlet, supports about 25% of Canada's breeding population of Pacific Common Eiders (Dickson, unpublished data). The North American eider population experienced a marked decline in recent years (Suydam et al. 2000), and is believed to be at moderate risk from resource development. Likely the entire Canadian breeding population stages in the southeastern Beaufort Sea for 2-3 weeks during spring migration (Dickson et al. 2005), hence they are highly vulnerable to development of offshore oil and gas reserves in that region. Three mines are currently under way in the Bathurst Inlet area, as well as a proposal for a port and road to the interior. The resulting habitat loss and increased human activity in the area are an additional threat to the Pacific Common Eider. This survey will provide a breeding population estimate for the Bathurst Inlet area, as well as provide a baseline for both monitoring abundance in the area and tracking population trends continentally. Survey results will also provide information on key areas for nesting eiders. A comparable survey was conducted in 1995, and thus will add to our knowledge of population trend for the Pacific Common Eider.

The breeding pair survey was conducted from 25 to 29 June, 2007. These dates were thought to be optimal based on a 5 year study of nesting chronology in the area and results from the 2006 survey. The 2007 survey was conducted from a Bell 206L helicopter flown at 50 to 100 m (150-300 feet) and at 130-145 kph (80-90 mph). The higher altitudes were used when search area was small and easily observed (narrow lead) or when large groups of eiders were present and we wanted to avoid flushing birds. In these areas of high densities of eiders air speed was reduced to facilitate an accurate count. The flight path followed the coast and ice edges, as well as circled islands and open water areas to obtain a complete count of all eiders. To maximize visibility of birds on the water the surveys were conducted during mid-day hours and when winds were calm or light.

Two observers, one on each side of the aircraft, recorded on tape the species, number, and when possible, sex and age of birds, as well as the time of the observation. Observations of Pacific Common Eiders were recorded as flock size, noting the number

or proportion of adult males and number or proportion of “brown” birds. FUGAWI GIS mapping software (Northport Systems Inc., Toronto, Ontario, Canada) logged all aircraft movements and provided real time locations at 2 second intervals, allowing observations to later be merged with specific locations using the time. Additional information on survey date and time, weather, amount of open water, and visibility were also recorded. Shoreline segments previously used during the surveys conducted in 1995 were again used for this survey so direct comparisons could be made and population trend information ascertained.

Objectives: The principle objectives of the study were: 1) to monitor population trend of the Pacific Common Eider in a core part of its North American breeding range, 2) to obtain a breeding population estimate for the Bathurst Inlet area, and 3) to identify key areas for nesting in Bathurst Inlet.

Preliminary Results: Pacific Common Eider numbers observed in 2007 were below numbers observed in the same segments in 1995 but similar to 2006. In the 43 segments that were surveyed in all three years there were 3009 males observed in 1995 compared to 1946 in 2006 and 1760 in 2007 (Table 1, Fig. 1). In the 115 segments that were surveyed in both 1995 and 2007 males observed were 8950 and 4219 respectively (Table 2, Fig. 2). The 2007 female count was similarly below 1995 numbers but was above those observed in 2006 (Tables 1 and 2, Figs. 1 and 2).

Work towards determining a detection rate for Pacific Common Eiders was done in both 2006 and 2007. In 2006 detection surveys were done only in areas with low eider densities. These areas are actually not a good representation of the survey in general. Also, due to aircraft time constraints, the sample size was small. Although a visibility correction factor (VCF) of 2.04 (± 0.19) was calculated, we have very little confidence in this result. In 2007 the detection survey was done in areas with higher densities of eiders. This resulted in a larger sample size and a VCF of 1.19 (± 0.02). We believe this result is more realistic. Nevertheless, we suspect this technique for correcting counts, which was developed for straight-line transects and detection of widely dispersed breeding pairs, is of limited use for Common Eider surveys. Firstly, most eiders occur in groups (10-300 birds). Consequently, it is the flock size estimation that is likely the main source of error in this study, not detection of scattered birds. Secondly, the survey line for Common Eiders is often convoluted as the survey aircraft seeks the open water and small islands where the eiders reside. Consequently, the backseat observer has a much different view of the eiders than the person in the front, so that it is very difficult to match counts between front and rear seat observers. The front seat observer typically can see and count birds as they flush upon the helicopter's approach. However, the rear seat observer often doesn't see these birds until after the birds circle back into view, if they see them at all. Thus, observation times for individual birds can vary by as much as 30 seconds or more between observers, making it difficult to match observations. However, during the actual survey the front seat observer would count these birds then inform the rear seat observer to ensure that they were not double counted. To alleviate the problem of matching observations, in 2008 we propose to select a part of the study area where the flight path is

reasonably straight, yet eider densities are still relatively high. To avoid errors in flock size estimation, we will use only experienced observers.

Project Status: Spring arrived a few days late in Bathurst Inlet in 2007 whereas it was very early in 2006. In 2006 much of the study area was ice free while in 2007 it was mainly ice covered with only a few open water areas and narrow leads of open water along shorelines. Nevertheless, in the segments that were surveyed both years, observed numbers of Pacific Common Eiders were similar. The consistent counts in 2006 and 2007 suggest that timing of the surveys was adequate in both years even though seasonal progression varied greatly. Although indicated breeding pairs were similar between the two years the male to female ratio differed substantially. Many more males than females were observed in 2006 indicating that many females had begun nesting. However, in 2007 male to female observations were almost equal indicating that nesting was just beginning. Likewise in 1995, there were an almost equal number of males and females. The variance in proportion of females observed demonstrates why the breeding pair count should be based on males, since females are so difficult to detect when on land. Thus timing the survey for when males are present is essential.

Comparison of the 1995 survey results to the more recent surveys suggests that the Pacific Common Eider has declined by over a third in the Bathurst Inlet area over the past decade. Ice conditions were somewhat extreme in both of the latter surveys: an unusually early melt in 2006 and late in 2007. Potentially some of the males might have already left the study area in 2006, whereas in 2007 some eiders might not have reached the breeding areas when the survey was completed. Either way the count would be low relative to 1995 numbers. However, since the numbers observed in 2007 are similar to those observed in 2006 it is more likely that the population has indeed decreased since the surveys were last completed in 1995. Another year of surveys should help clarify whether Pacific Common Eiders have declined in Bathurst Inlet over the past decade.

The limited amount of open water in 2007 allowed us to survey over twice the area than in 2006 with approximately the same number of hours of aircraft flight time (Fig. 3). Given it is so much more efficient to survey before large expanses of open water form, we recommend that surveyors be ready to start by no later than June 21 in 2008 to ensure optimal timing of surveys.

Project Funding Sources for FY 07:

SDJV (USFWS) Contribution	Other U.S. Federal contributions	U.S. non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (agency or organization)
\$25,000					
			\$25,000		CWS
			\$50,000		PCSP

Total Expenditures (SDJV plus partner contributions) by Category in FY 07:

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					
Surveys	\$100,000				\$100,000
Research					
Communication					
Coordination					

Area (segment)	Males - 1995	Males - 2006	Males - 2007	Females - 1995	Females - 2006	Females - 2007
85 (8)	46	11	0	38	6	0
86 (1,3)	12	11	3	9	7	1
87 (2,3)	248	586	126	227	258	119
88 (1,2,3,4)	627	229	166	524	192	154
89 (1,2,3)	258	236	218	225	129	200
90						
(1,2,3,5,6,7)	565	304	381	541	146	374
92 (3,4)	6	23	3	5	12	3
94 (2,3,4)	225	109	48	216	49	48
96 (1,3)	90	35	84	86	19	85
97						
(1,2,3,4,5,6,7)	179	115	267	210	53	267
98						
(1,2,3,4,5,6)	634	204	415	338	98	356
99 (1)	2	0	12	3	0	12
100 (1,2,3)	111	51	19	75	34	17
101 (2)	6	32	18	4	33	15
Total:	3009	1946	1760	2501	1036	1651

Table 1. Number of male and female Pacific Common Eiders observed in 1995, 2006, and 2007.

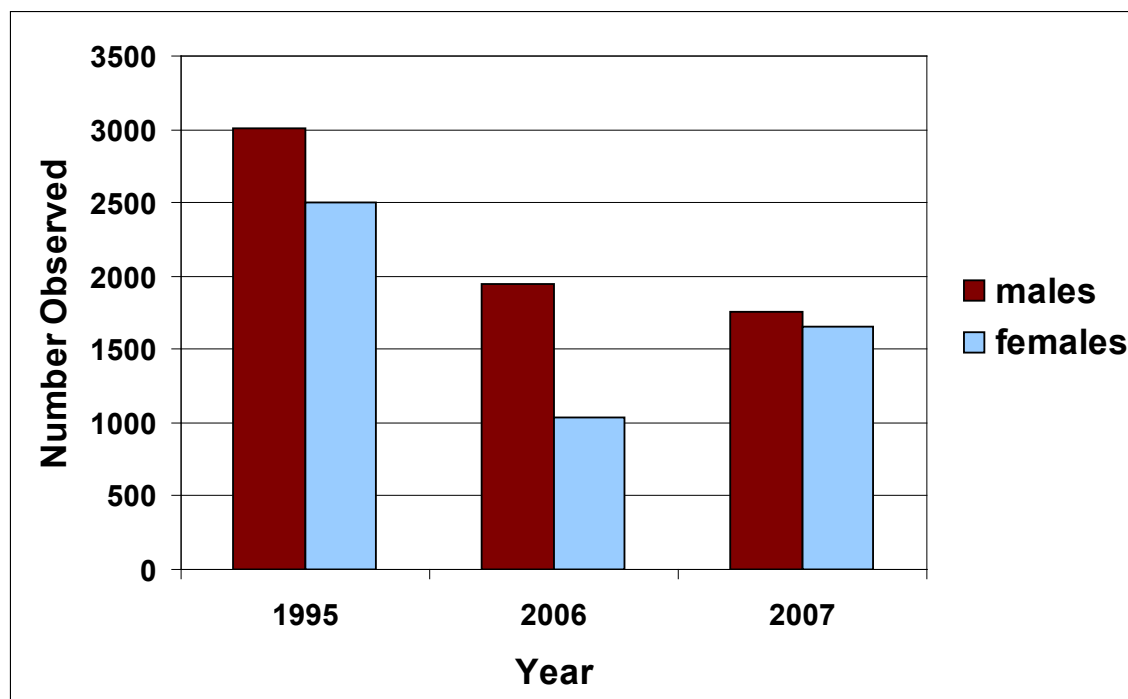


Figure 1. Numbers of male and female Pacific Common Eiders observed in the 43 segments surveyed in the Bathurst Inlet, Nunavut in 1995, 2006 and 2007.

Area (segment)	Males - 1995	Males - 2007	Females - 1995	Females - 2007
82 (1,2,3)	104	64	83	63
83 (1,2,3,4,5)	607	94	544	88
84 (1,2,3,4,5)	397	84	377	76
85 (1,2,3,4,5,6,7,8,9,10)	1852	459	1564	452
86 (1,2,3)	67	8	62	6
87 (1,2,3)	277	142	247	134
88 (1,2,3,4)	627	166	524	154
89 (1,2,3,4)	616	470	580	443
90 (1,2,3,4,5,6,7)	575	381	551	374
91 (1,2,3,4)	325	465	308	465
92 (1,2,3,4)	1035	552	989	552
93 (1,2,3,4,5)	223	111	208	110
94 (1,2,3,4,5)	450	72	424	71
95 (1,2,3)	23	50	19	49
96 (1,3)	90	84	86	85
97 (1,2,3,4,5,6,7)	179	267	210	267
98 (1,2,3,4,5,6)	634	415	338	356
99 (1)	2	12	3	12
100 (1,2,3)	111	19	75	17
101 (1,2)	37	35	12	24
119 (1,2)	31	28	18	29
120 (1,2,3,4,5,6)	243	83	207	76
121 (1,2,3)	123	45	95	43
122 (1,2,3,4)	54	30	34	23
123 (1,2,3,4,5,6)	181	34	186	29
124 (1,2,3)	29	30	17	21
125 (1,2,3)	29	9	22	6
126 (1,2)	29	10	26	9
Total:	8950	4219	7809	4034

Table 2. Number of male and female Pacific Common Eiders observed in 1995 compared to 2007.

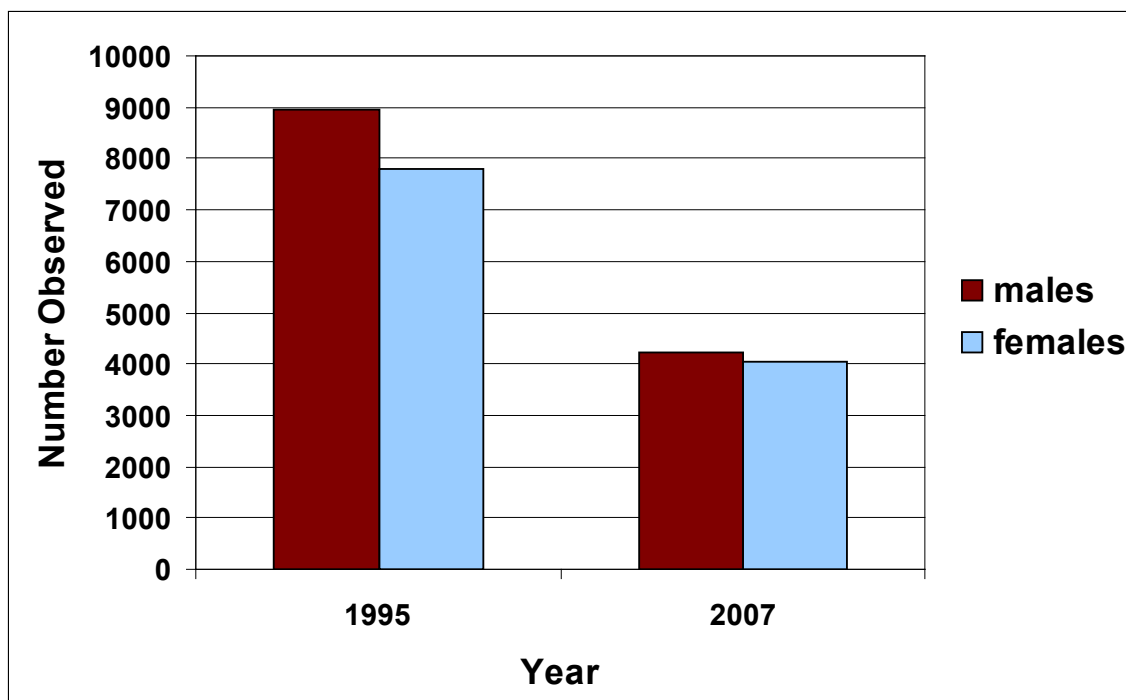


Figure 2. Numbers of male and female Pacific Common Eiders observed in the 115 segments surveyed in the Bathurst Inlet, Nunavut in both 1995 and 2007.

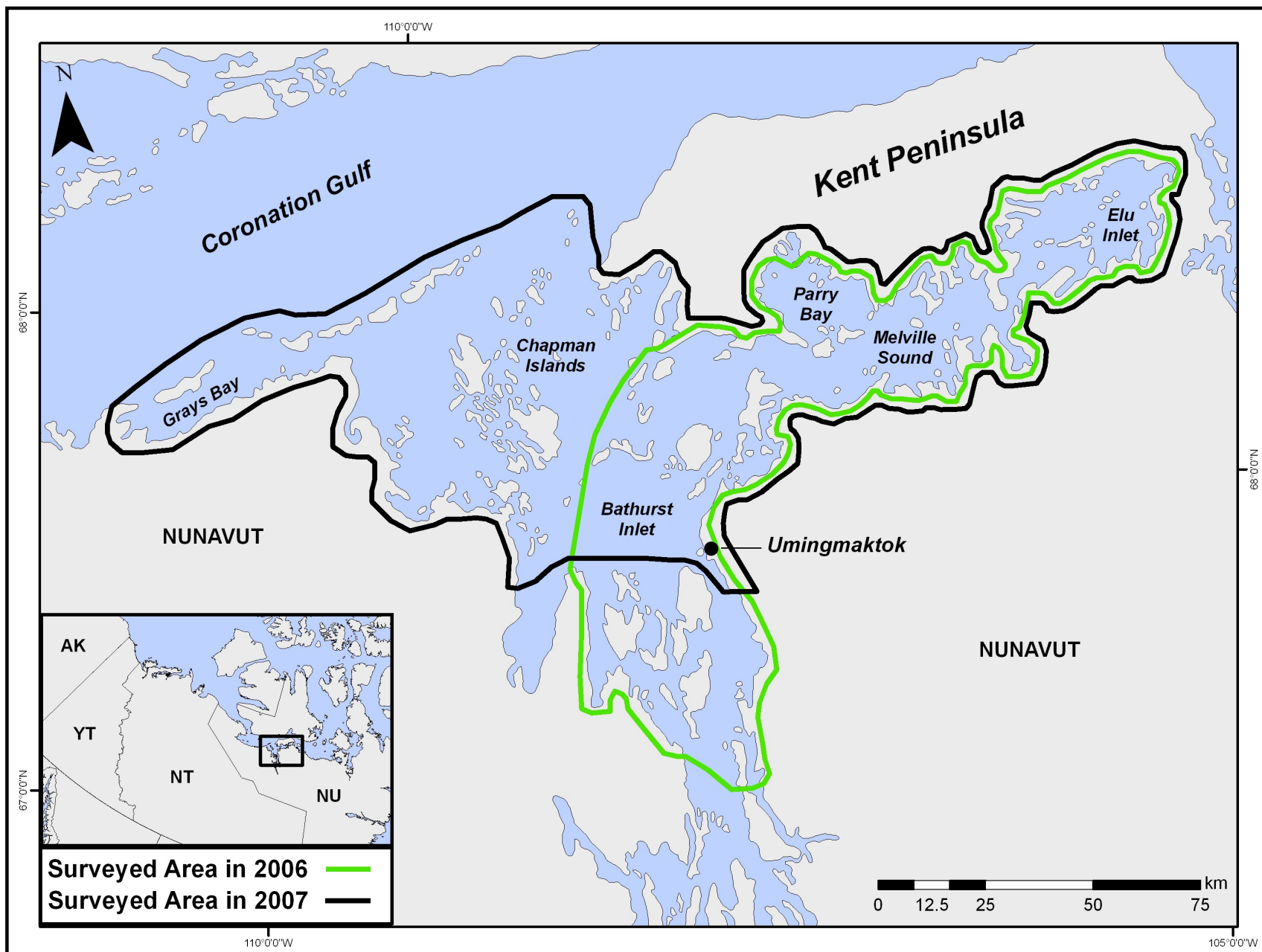


Figure 3. Map showing extent of survey coverage for Pacific Common Eiders in the Bathurst Inlet area of Nunavut in 2006 and 2007.

