Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2008– (October 1, 2007 to Sept 30, 2008)

Project Title: No. 80. Surveys of Common Eiders in the Bathurst Inlet Area of Nunavut. Year 3 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Sound, Parry Bay and Elu Inlet, supports about 25% of Canada's breeding population of Pacific Common Eiders (Dickson, unpublished data).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 24 to 28 June, 2008. These dates were thought to be optimal based on a 5 year study of nesting chronology in the area and results from the 2006 and 2007 surveys. As in previous years, the 2008 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: Areas surveyed for Pacific Common Eiders in 2008 were identical to 2007 (Fig. 1). Pacific Common Eider numbers observed in 2008 were above those observed in 2007 (Table 1, Fig. 2) but remain below totals observed in 1995 (Table 2, Fig. 3). In the 44 segments that were surveyed in all four years of the survey there were 3009 males observed in 1995 compared to 1957 in 2006, 1762 in 2007, and 2441 in 2008 (Table 2, Fig. 3). In the 118 segments that were surveyed in both 2007 and 2008 males observed were 4233 and 4916 respectively (Table 1, Fig. 2). Like 1995 (83%) and 2007 (96%), the 2008 (93%) female count was nearly as high as the male count indicating the survey was timed early in the breeding season and not likely to have missed any early departing males. In contrast, the female count in the early spring of 2006 was only 57% of the male count (Tables 2, Figs. 2 and 3).

Work towards determining a detection rate for Pacific Common Eiders continued in 2008 and will be combined with results from 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. A visibility correction factor (VCF) of 2.04 (±0.19) was calculated in 2006. We believe this result is high since more typical survey observations are of eiders in groups and not easily missed by observers. In 2007 and 2008 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) and 1.12 (±0.01) respectively. We believe these results are more realistic. Combining the three years gives a VCF of 1.18 (±0.01) and likely closely represents the typical mix of survey conditions. Nevertheless, we suspect this technique for correcting counts, which was developed for straight-line transects and detection of widely dispersed breeding pairs, has its limitations for Common Eider surveys. Most Common Eider observations are of groups (10-300 birds) so detection is easier than for species typically observed in singles or pairs and thus likely less of a factor for this type of survey. A potential source of error in calculating a VCF for this type of survey is correctly matching observations by the front and rear seat observers. The flight path for this Common Eider survey is often convoluted as the survey aircraft follows the irregular shoreline and circles open water and small islands where the eiders are likely to be. Consequently, the backseat observer has a much different view of the eiders than the person in the front. 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. 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 during detection surveys, in 2008 we selected a part of the study area where the flight path was reasonably straight, yet eider densities were relatively high. If the front seat observer believed the rear seat observer may not have had an opportunity to observe a flock it was communicated and removed from VCF analysis. In addition, the survey track was mapped using GIS and used to aid in matching of observations in areas with a convoluted flight path. Differences in flock size estimation between observers, not undetected birds, are likely the largest source of unmatched observations during detection surveys and consequently contribute the most to the calculated VCF. However, utilizing experienced observers can minimize the effect of flock size estimation on the VCF.

Project Status: Spring arrived on schedule in the Bathurst Inlet in 2008. It was likely 2-5 days earlier than in 2007 but not nearly as early as in 2006. In 2006 much of the study area was ice free during our survey while in 2007 and 2008, 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 in all 3 years, observed numbers of male Pacific Common Eiders were similar. The consistent male counts suggest that timing of the surveys was adequate in all years despite great variation in seasonal progression. The ratio of males to females coincided with seasonal progression in all 3 years of the survey. In the early spring of 2006 many females had begun nesting and the results show that with the lower male to female ratio. In the later springs of 2007 and 2008 the opposite was true and nearly as many females were observed as males. The results observed demonstrates why the breeding pair count should be based on males. Females are difficult to detect when on land and seasonal variation can greatly affect the count whereas the window for getting an accurate count on males is greater.

Comparison of the 1995 survey results to the more recent surveys suggests that the Pacific Common Eider has declined in the Bathurst Inlet area over the past decade. The relatively consistent results over the last three years lends confidence to the ability of the survey to accurately track the population of Pacific Common Eiders in the Bathurst Inlet area if the survey was conducted on a semi-annual basis. Experience gained from the previous 3 years of surveys shows that an operational survey could be conducted relatively efficiently if timed correctly and managed appropriately. Areas north and west of the Chapman Islands, as well are areas south of Umingmaktok, have very low densities of Pacific Common Eiders and should not be included in a semi-annual survey. Once these areas are removed the survey could be completed with 3 full days of flying; one day for the Elu Inlet/Melville Sound, one day for Parry Bay and the northern Bathurst Inlet, and one day for the Chapman Islands. Of course this depends on favorable weather and timing the survey correctly to insure adequate ice conditions. Detection surveys and travel to and from the study site would add an additional 2 days and weather conditions could also affect time required for the survey.

Project Funding Sources for FY 08:

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					
			$54,000		Polar Continental Shelf Project (PCSP)
			$20,000		Canadian Wildlife Service (CWS)

Total Expenditures (SDJV plus partner contributions) by Category in FY 08:

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					
Surveys	$99,000				$99,000
Research					
Communication					
Coordination					

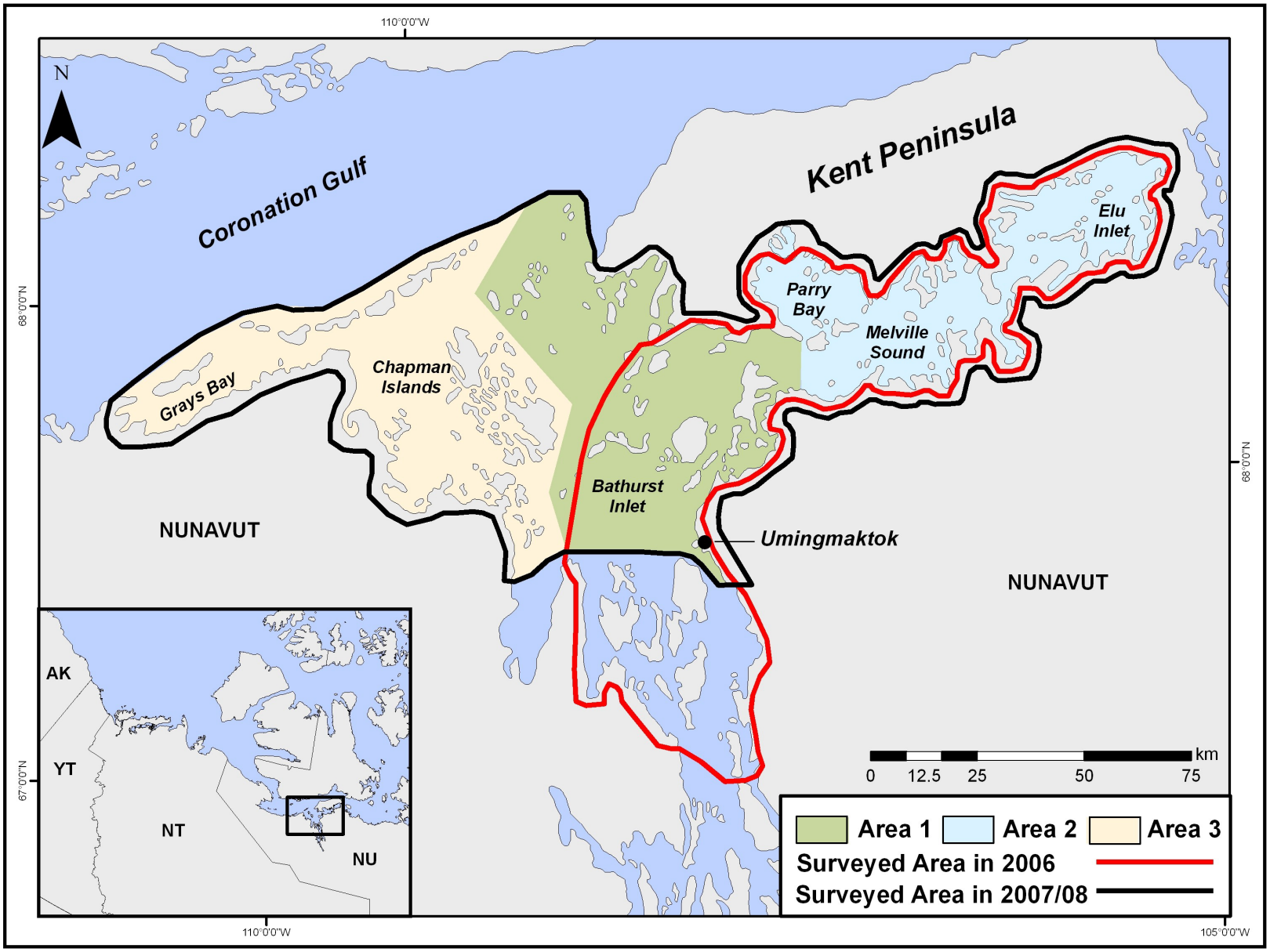

Figure 1. Map showing surveyed areas and extent of survey coverage for Pacific Common Eiders in the Bathurst Inlet area of Nunavut in 2006, 2007 and 2008.

Area (segment)	Males - 2007	Males - 2008	Females - 2007	Females - 2008
1 (1-34)	960	858	863	789
2 (1-45)	2545	3407	2497	3208
3 (1-39)	728	651	688	581
Total:	**4233**	**4916**	**4048**	**4578**

Table 1. Number of male and female Pacific Common Eiders observed in 2007 compared to 2008. Area 1 consists of the NE portion of the Bathurst Inlet. Area 2 consists of Parry Bay, Elu Inlet, and Melville Sound. Area 3 consists of the NW portion of the Bathurst Inlet, Chapman Islands, Gray's Bay, and the Jameson Islands.

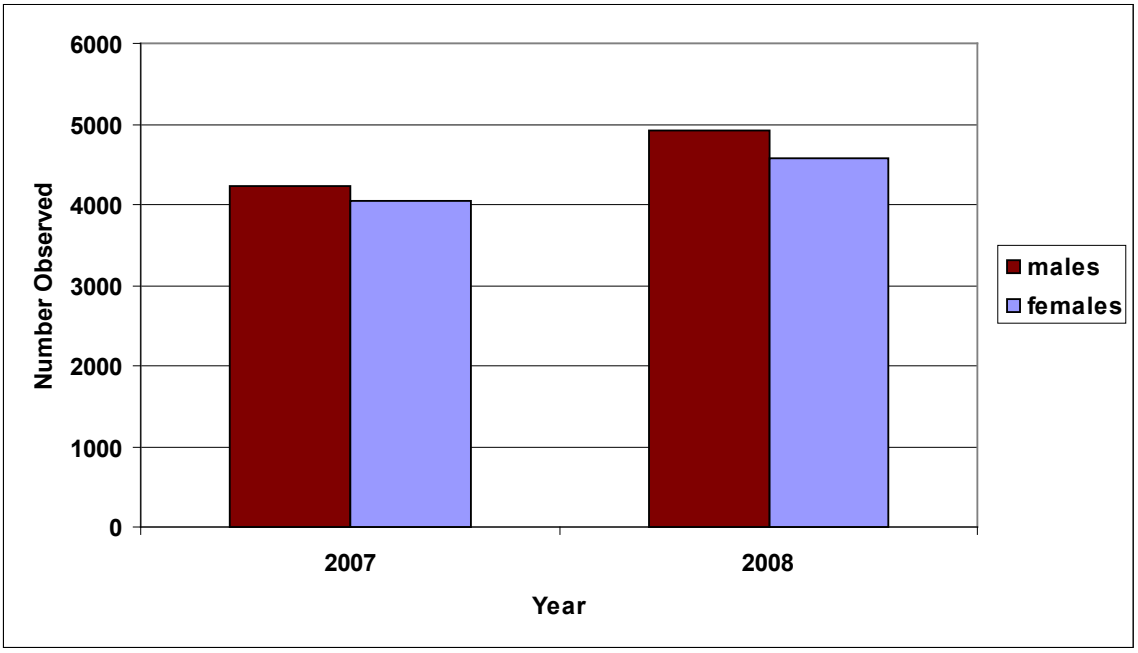

Figure 2. Numbers of male and female Pacific Common Eiders observed in the 118 segments surveyed in the Bathurst Inlet, Nunavut in both 2007 and 2008.

Area (segment)	Males - 1995	Males - 2006	Males - 2007	Males - 2008	Females - 1995	Females - 2006	Females - 2007	Females - 2008
1 (14, 16, 18-27, 30-32, 34)	1210	891	668	576	848	435	595	542
2 (1-6, 8-10, 12-14, 21, 22, 29-31, 36-45)	1753	1055	1094	1860	1615	604	1058	1777
3 (8)	46	11	0	5	38	6	0	5
Total:	**3009**	**1957**	**1762**	**2441**	**2501**	**1045**	**1653**	**2324**

Table 2. Number of male and female Pacific Common Eiders observed in 1995, 2006, 2007 and 2008. Area 1 consists of the NE portion of the Bathurst Inlet. Area 2 consists of Parry Bay, Elu Inlet, and Melville Sound. Area 3 consists of the NW portion of the Bathurst Inlet, Chapman Islands, Gray's Bay, and the Jameson Islands. Observations include only the portion of each area that was surveyed in each of the 4 years.

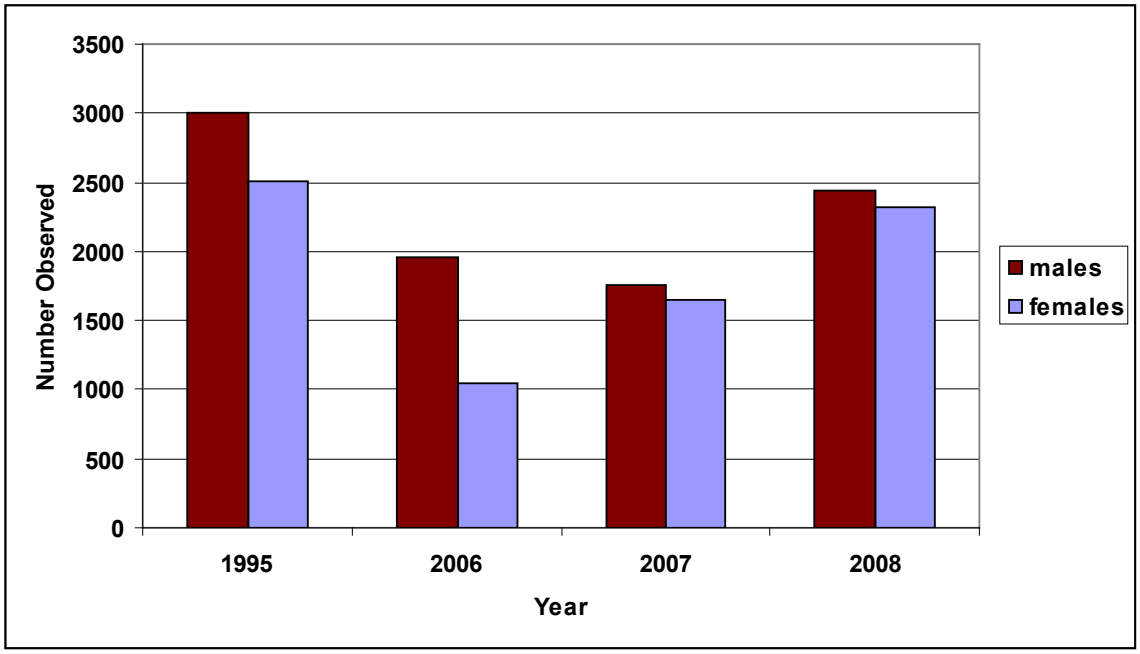

Figure 3. Numbers of male and female Pacific Common Eiders observed in the 44 segments surveyed in the Bathurst Inlet, Nunavut in 1995, 2006, 2007 and 2008.