

## Canada Goose Survey on Middleton Island - 2010

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We conducted a survey of Canada geese on Middleton Island from June 22-24, 2010. This effort is directed at documenting growth of this island group and periodically determining its status as part of the dusky Canada goose population. Survey methodology was similar to surveys conducted in 1996, 1997, 2000, 2002, 2004, 2006 and 2008.

### **Estimation of Broods, Brood Size and Gosling Abundance**

Accurate counts of goslings were difficult to obtain when broods were flushed in thick vegetation. Brood size and age class were also difficult to determine for some family groups observed offshore because of their distance from the observer, the tendency for family groups to associate with other geese, and the effects of the surf and other obstructions (rocky outcrops) on observation. To estimate average brood size we used brood observations where the total number of goslings were accurately determined and the number of adults observed with the brood was  $< 3$  ( $n=155$  broods). Family groups with  $> 2$  adults may have comprised more than one brood, therefore they were not included in the calculation of average brood size. We used the average brood size to calculate the number of goslings in broods when the number of young could not be accurately counted ( $n=88$  broods), and when broods were suspected but not observed ( $n=52$ ; Table 1). For family groups with more than 2 adults ( $n=13$ ), we divided the number of goslings by the average brood size to estimate the number of broods ( $n=18$ ).

### **Results and Discussion**

Our counts of Canada geese should be considered a minimum for the island because some geese go undetected and small portions of the island are not surveyed. Effort among years has been consistent. We counted 1249 adult and 781 young Canada geese on Middleton Island during 3 days of surveys (Table 1). Average brood size was 3.75 goslings ( $SD = 1.60$ ). We estimated that 976 goslings were present in 313 broods (Table 1).

The number of adult geese observed in 2010 was slightly lower than the average of our previous surveys (Table 1) however, little change has occurred in the size of the breeding population during the last 14 years (Fig. 1). We estimated that 43.9 % of the Canada goose population on Middleton Island was composed of young in 2010; slightly higher than average and remaining consistently high for this island nesting group (Table 1).

### **ACKNOWLEDGEMENTS**

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Table 1. Numbers of Canada geese observed on Middleton Island, Alaska during June in 1996 - 2010.

Year <sup>a</sup>	Number of Adults	Number of known-sized broods <sup>b</sup> (#young)	Number of unknown-sized broods (#young) <sup>c</sup>	Number of estimated broods (#young) <sup>d</sup>	Number of suspected broods <sup>e</sup>	Average brood size <sup>f</sup> (SD)	Goslings counted (estimated) <sup>g</sup>	Number of broods	Total geese <sup>h</sup>	% young
1996	1497	62 (227)	59 (140)	51 (184)	20	3.66 (1.7)	551 (673)	192	2170	31.0
1997	1168	25 (96)	132 (317)	48 (183)	18	3.84 (1.6)	596 (884)	223	2052	43.1
2000	1309	151 (586)	81 (167)	44 (169)	39	3.85 (1.7)	922(1220)	315	2529	48.2
2002	1416	107 (347)	69 (147)	51 (167)	18	3.24 (1.5)	661 (806)	245	2222	36.3
2004	1499	105 (360)	70 (132)	37 (126)	42	3.46 (1.6)	618 (876)	254	2375	36.9
2006	1453	166 (564)	52 (92)	34 (117)	31	3.52 (1.9)	773 (974)	283	2427	40.1
2008	1317	100 (331)	43 (82)	67 (220)	30	3.31 (1.5)	633 (795)	240	2112	37.6
2010	1249	155 (582)	88 (152)	18 (47)	52	3.75 (1.6)	781 (976)	313	2225	43.9
Average	1364	109 (387)	74 (154)	44 (152)	31	3.58 (1.6)	692 (901)	258	2264	39.6

<sup>a</sup> Surveys were conducted within a 4-day period between June 19 and June 27.

<sup>b</sup> The number of broods in which the number of goslings were counted accurately and the number of adults present was < 3.

<sup>c</sup> The number of broods in which the number of goslings were not counted accurately and the number of adults present was < 3.

<sup>d</sup> We used average brood size to calculate the number of broods when the number of adults present was > 2 regardless of whether an accurate gosling count was obtained. The number of young represents the number of goslings observed.

<sup>e</sup> Single or paired adult geese that flushed from thick vegetation close to the observer. Goslings were suspected of being present but were not observed.

<sup>f</sup> Average number of goslings in known-sized broods.

<sup>g</sup> Estimated goslings include those observed and those estimated in suspected and unknown sized broods.

<sup>h</sup> Adults + estimated young

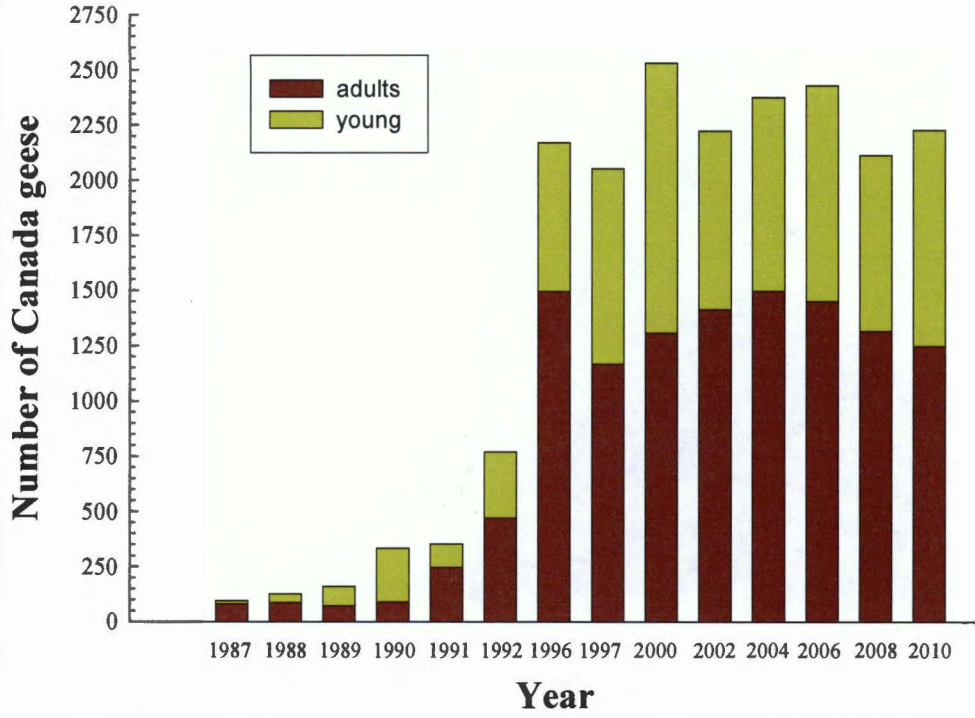


Fig. 1. Number of adult and young Canada geese estimated on Middleton Island, AK.