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21 June 2010

MEMORANDUM TO: Mississippi Valley Population Co-operators, Mississippi Flyway
SUBJECT: 2010 Preliminary Spring Survey Results for MVP Canada Geese

Please find below the 2010 estimates of breeding pairs and total spring population size (Table 1) for MVP Canada geese. Again this year, we flew the survey using a Twin Otter aircraft meaning the results are directly comparable with those of previous years. We flew the survey from 15 to 18 May under ideal conditions. However, we did forgo one transect in Stratum 1 due to local fog.

Spring phenology was very early in 2010 compared to the recent 5-year average and was one of the earliest of all years surveyed since 1989. This is in stark contrast to 2009 which was one of the latest seasons recorded for the same period. There was a much smaller than average snow pack on the MVP breeding range last winter and spring was characterized by mean daily temperatures well above average in late April and throughout May with open nesting habitat available to geese in early May.

We visited the Burntpoint Creek camp east of Peawanuck on 16 May finding almost no snow and unseasonably dry conditions. We spent several hours searching for Canada goose nests near the camp estimating a peak hatch of about 3 June. A crew was stationed at the camp from 27 May to 9 June to conduct a more thorough search of the study area for nests and to document nesting ecology. We found an average breeding effort but a very high predation rate with most depredation attributed to gulls. We also found that hatch was protracted this year extending over a 3-week period and is the earliest recorded.

The estimated 2010 breeding population of 339,310 (calculated number of indicated breeding pairs x 2) was up from 239,631 in 2009 and was only 6% below the 1989-2009 average. In contrast, the 2010 total spring population estimate was 359,687, well below that of 2009 (518,232) and 40% below the 1989-2009 average. In 2010, next to no flocked birds were observed on transects, including the coastal stratum, suggesting that there were very few yearlings and non-breeding adults. Given the early date of the survey, no Temperate-Breeding molt migrants were expected and their absence may also have contributed to low flocked bird counts. The absence of yearlings is not a surprise given the record poor productivity in 2009. Further, given the good conditions and record early phenology in 2010, it is likely that younger cohorts (2-year olds in their first year of breeding opportunity and 3-year olds who could not nest for the first time in the late year of 2009) likely attempted nesting this year. Note that total population size estimates reported here are slightly different from those reported in previous annual reports because we did not include observations from supplementary coastal transects (1991 - 2000) or add a constant value for coastal flocked birds (2002 - 2007).

We continue to focus the objective of the survey to one of change detection rather than comparison of annual population estimates. To estimate change from previous years, we first averaged the number of indicated breeding pairs on each transect for the previous 5 years

(2005 to 2009). Model fit was adequate for ($\chi^2/df < 1.34$) using a negative binomial distribution and an auto-regressive covariance structure. The transect level count indicated the number of breeding pairs was significantly lower in 2010 compared to the previous 5-year mean (effect size = 0.111, SE = 0.052, 95%CL = 0.010 to 0.213, P = 0.031) for all strata combined. When analyzing by Strata, only Stratum 1 indicated breeding pairs were significantly lower than the 5-year mean. This drop is not reflected in the estimated total indicated pairs by strata in table 1 because only birds observed as singles are used in a regression equation to estimate abundance for Stratum 1. The lower number of pairs (but not singles) by transect in Stratum 1 is likely because there were few if any non-breeders given the early season phenology and the low productivity from the previous year.

We are confident in the results of the 2010 survey and would be pleased to answer any questions if you require additional information.

Rod Brook
Ontario Ministry of Natural Resources
Wildlife Research and Development Branch
DNA Bldg, Trent University, 2140 East Bank Dr.
PETERBOROUGH, Ontario
K9J 7B8

Telephone: (705) 755-1503
E-mail: rod.brook@ontario.ca

Jack Hughes
Canadian Wildlife Service
Ontario Region
South Wing, Room 3624, 335 River Rd.
OTTAWA, Ontario
K1A 0H3

Telephone: (613) 949-8259
E-mail: jack.hughes@ec.gc.ca

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Table 1. Spring breeding ground estimates for the Mississippi Valley Population of Canada geese for 2010. Standard error is in parenthesis.

Stratum	Area (km ²)	N	Breeding Birds ¹		Non-Breeders		Total Geese ²		
I	8,560	9	40,909	(8,841)	10,386	(5,830)	51,295	(10,968)	
II	59,898	47	153,892	(7,981)	9,992	(5,067)	163,883	(10,664)	
III	133,188	16	144,509	(42,230)	0	(-)	144,509	(42,230)	
Total	201,646	72	339,310	(43,877)	20,378	(7,724)	359,687	(44,915)	
							95% C.I.	271,654 – 447,721	

¹ All values in the table have been corrected using a visibility correction regression or factor specific to each stratum.

Breeding birds = Indicated Breeding Pairs X 2.

² Total Geese = (Indicated Breeding Pairs X 2) + birds in flocks (n ≥ 3).

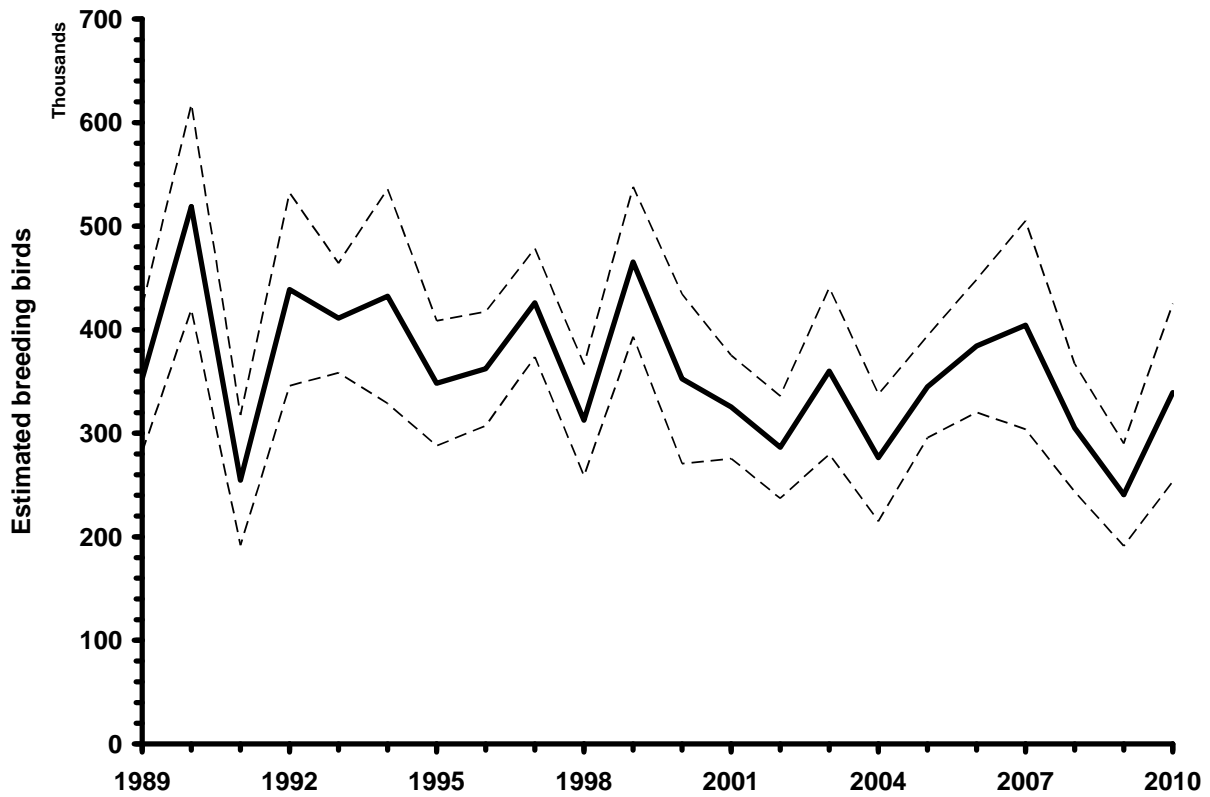


Figure 1. Annual index of breeding Canada geese in the Mississippi Valley Population. Dashed lines are 95% confidence limits. Estimates prior to 2002 are slightly different than previously reported after minor transcription errors and inconsistencies in analytical methods were fixed to help improve annual comparison.

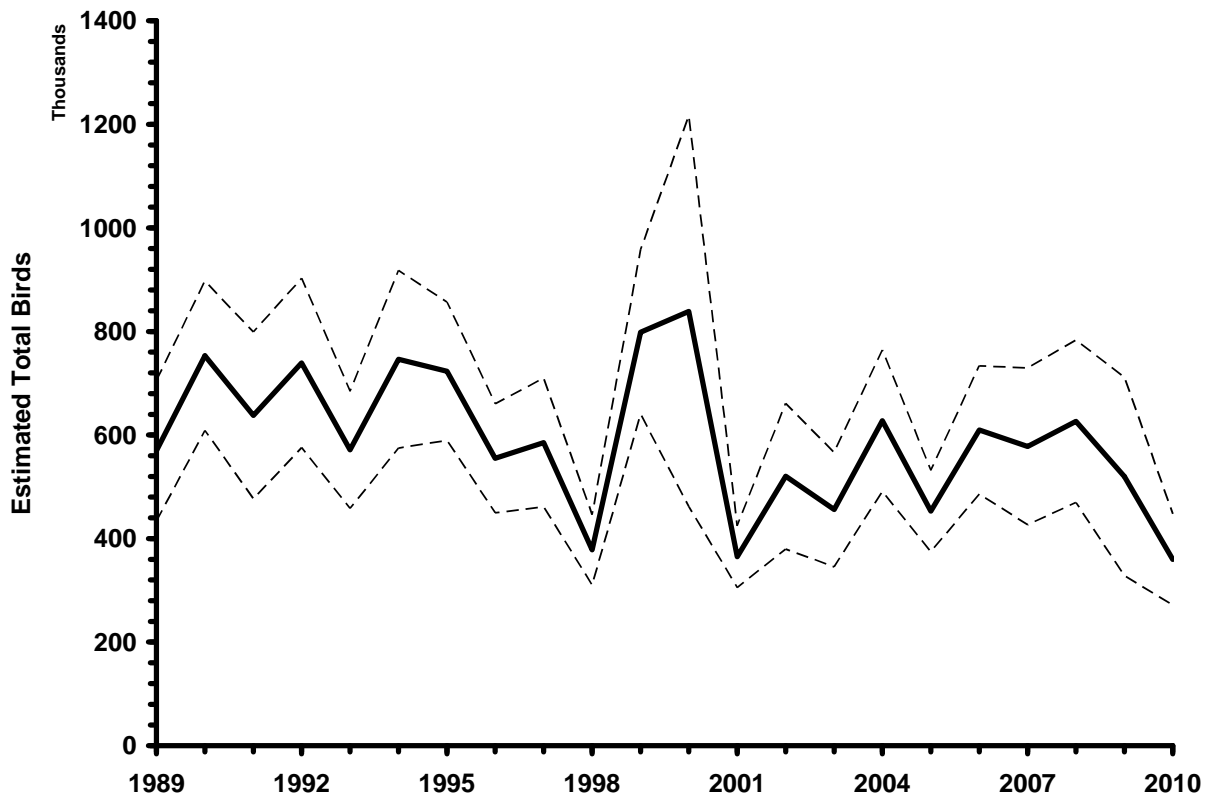


Figure 2. Total estimated spring population of MVP Canada geese. The dashed lines are 95% confidence limits. Estimates differ somewhat from those reported previously after fixing transcription errors and slightly changing the formula for total birds to improve comparability between years. Also, in previous years, non-breeder numbers from supplementary coastal transects (1991 – 2000) or a constant value (2001 – 2007) were added to the total of breeders and non-breeders observed on the standard transects. The coastal transect totals or constants are not included in this graph to improve year-to-year comparability.