

Evaluation of canvasback population estimates

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1. We compared the canvasback population decline observed from 2007-2008 with historical annual changes in canvasback estimates. The canvasback population estimate is highly variable and exhibits large jumps in some years. The change in the estimate from 2007 to 2008, while large, is not unprecedented for this species.

Percent change: The estimated decrease from 2007 to 2008 (−43.5%), while large, is within the range of historical changes. There is one larger percent decrease (−43.8 between 1977-78) and three larger percent increases (45.7, 46.6, 56.0 for 1972-73, 1994-95, and 1978-79, respectively).

Absolute change: The 95% confidence interval (CI) for the 2008 canvasback population estimate is (399.7-577.6 thousand birds) and the 95% CI for 2007 is (696.0-1033.9) with an estimated decrease of 376.3 thousand birds. Using our current methodology to estimate change, the 95% CI for the total decrease is (−567.2, −185.3). This is the largest observed decrease on record, but the confidence interval for the 2007-08 estimated change overlaps with the CIs for 21 of the previous 47 intervals.

2. We evaluated the possibility that errors by individual observers, or survey crews, during the spring population survey could have biased canvasback counts in 2007 or 2008. Decreases occurred in all survey crew areas and the total counts of pairs, single drakes, and grouped birds decreased, with the declines greatest for birds coded as single drakes and grouped. Canvasback counts and population estimates declined in 2008 in the same areas that increases were observed in 2007. We found no evidence of inconsistencies in counts or estimates that could be attributed to individual observers or survey crews.

Relative to the overall population estimate, canvasback pair counts were somewhat higher than expected in 2008, with low single and grouped counts. The proportion of birds counted in pairs in 2008 is the highest on record (61% v. an average of 36%; this is 12% higher than next highest at 49%).

3. We evaluated the potential that canvasbacks were mis-identified as redheads during this year's survey. The average percent change in the canvasback visibility correction factors (VCFs) for the six prairie-parkland crew areas from 2007-08 was −18%, which was similar to the decrease for redheads (−14%). Because we would expect canvasback VCFs to increase, with concomitant decreases in redhead VCFs, if canvasbacks were mis-identified as redheads, we do not have evidence that mis-identification resulted in a low canvasback estimate.

4. We evaluated the variance of the 2008 canvasback population estimate to determine if the level of variability is consistent with previous years. The 2008 coefficient of variation (a measure of variability in the estimate relative to the size of the estimate) for canvasbacks is 0.09. The average for the previous ten years is 0.10, indicating that the 2008 estimate's variance is comparable to previous years.
5. We looked for evidence that canvasbacks overfly prairie breeding habitats during drier years and that during dry years on the prairies a greater proportion of the population settles in unsurveyed (or less intensively surveyed) areas to the north. This "overflight effect," if present, could cause unrealistically large declines in canvasback population estimates when prairie habitats are dry. There is no evidence in the historical data that canvasbacks overfly the prairies in large numbers in dry years nor was there evidence of an overflight in 2008. For some species (e.g., northern pintails), there is historical evidence that when the prairies are dry, birds overfly this region to settle in the boreal forest. For pintails, and a few other species, we have noted that population estimates decline at an unexpectedly high rate when this overflight occurs, suggesting that these species may settle in unsurveyed areas or other remote areas that are less intensively covered by spring population surveys. When this effect is discernable, again as it is for pintails, we are able to correct for this bias and use adjusted population estimates to establish appropriate hunting regulations. We currently have no evidence that this overflight effect occurs for canvasbacks.