APPENDIX

Pup abundance from the plot-sampling data was estimated using a Horvitz-Thompson-like stratified random sampling estimator (Horvitz & Thompson, 1952; Thompson, 1992; Borchers *et al.,* 2002) in *S*=2 strata:

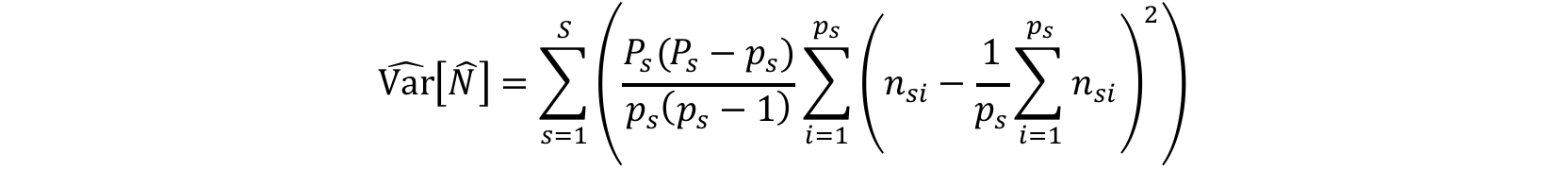


where is the total estimate, *nsi* is the number of pups encountered at plot *i* in stratum *s*, *Ps* is the total number of pupping sites (plots) in stratum *s*, and *ps* is the number of sampled plots in stratum *s*.

The 95% confidence interval of the estimate was calculated as:



where



and *t* is the Student *t*-distribution critical value (*t* = 2.365) at approximated degrees of freedom of *df* = 7.37 (Satterthwaite, 1946 cited in Thompson, 1992).