



**Figure S2** Bias in the maximum-likelihood estimate of population size under neutrality. The figure shows the ratio of the most-likely population size under neutrality,  $\tilde{N}$ , to the true population size,  $N$ , as a function of the number of sampled points  $L$  (left panel) and as a function of the length of the observed time series  $T$  (right panel). Whiskers indicate quartiles of the distribution of  $\tilde{N}/N$ . In the right panel, curves for different population sizes are slightly shifted along the x-axis for clarity. Bias in  $\tilde{N}$  decreases as the number of sampled time points increases. The bias is nearly independent of  $N$  and of the length of the sampling period. The number of Wright-Fisher simulations was  $10^5$ .