

## Figures

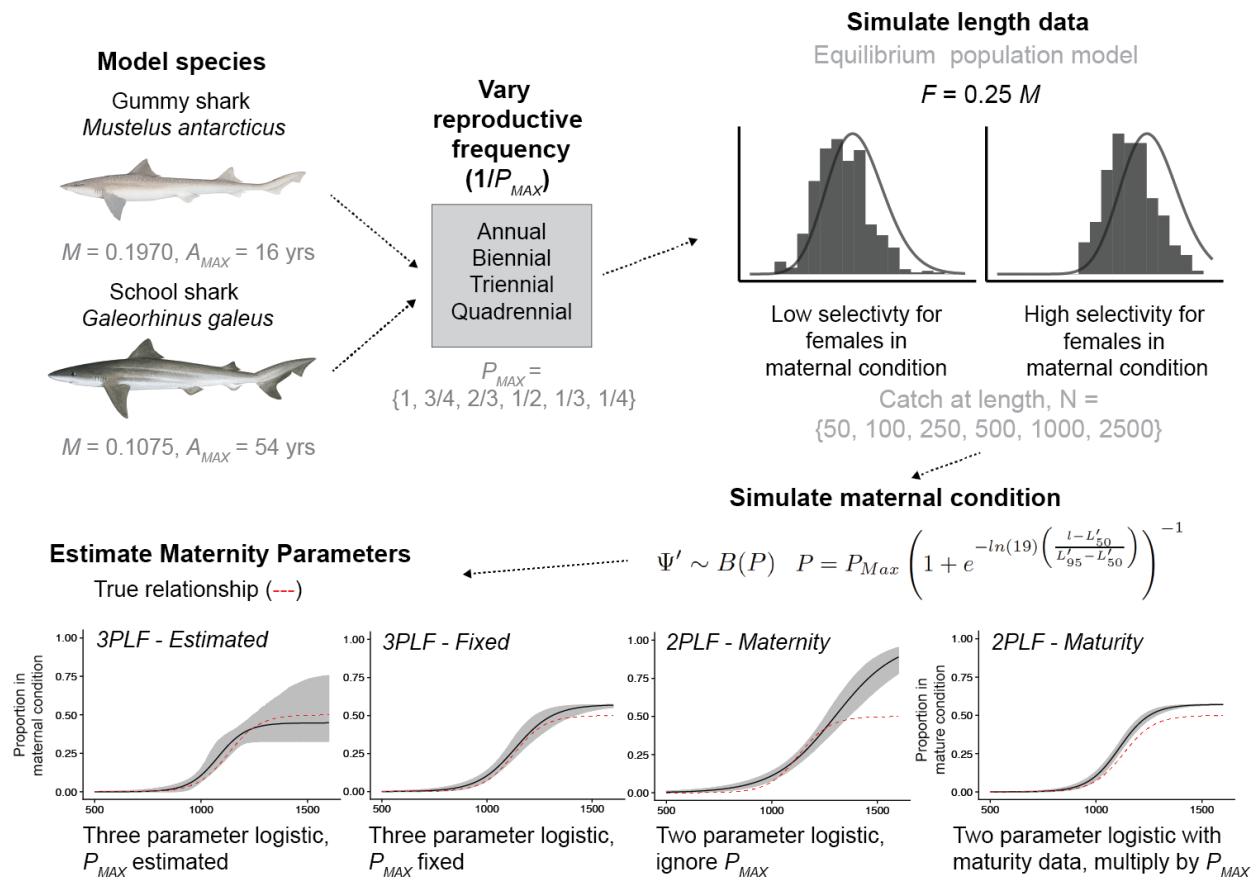


Figure 1. Approach used to generate simulated data and test the performance of four methods for calculating maternity parameters. Illustrations © R.Swainston/www.anima.net.au

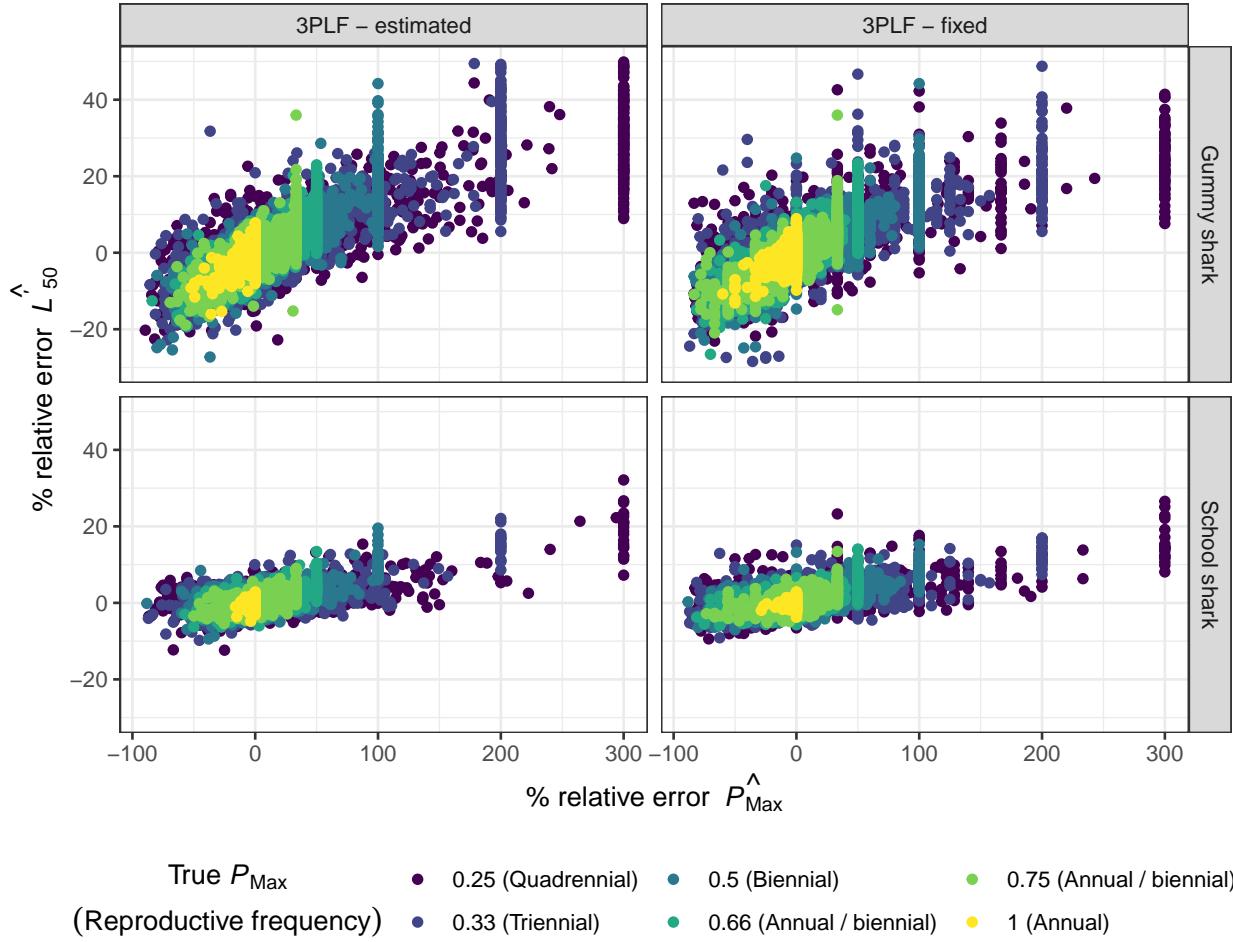


Figure 2. Bias (per cent relative error) in parameter estimates for  $\hat{L}_{50}$  and  $\hat{P}_{Max}$  for 3PLF methods. Each point represents parameter estimates from one iteration of simulated data. Bias tended to increase as the true underlying  $P_{Max}$  decreased.

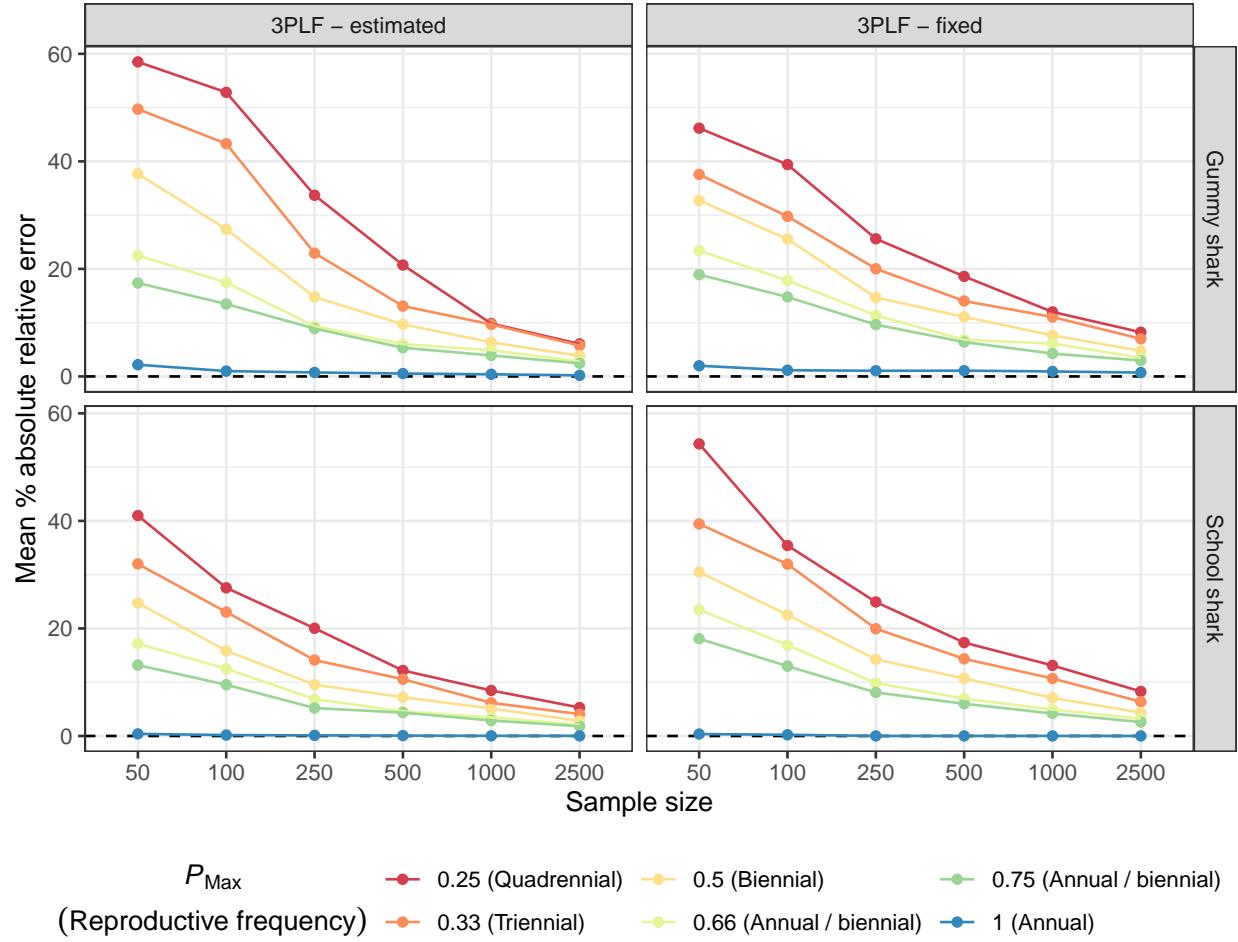


Figure 3. Precision (per cent absolute error) in parameter estimates of  $\hat{P}_{Max}$  for 3PLF methods. Large sample sizes were needed to accurately estimate  $\hat{P}_{Max}$  and precision decreased as the duration of the reproductive cycle increased. Each point reflects a mean value from 300 simulated data sets.

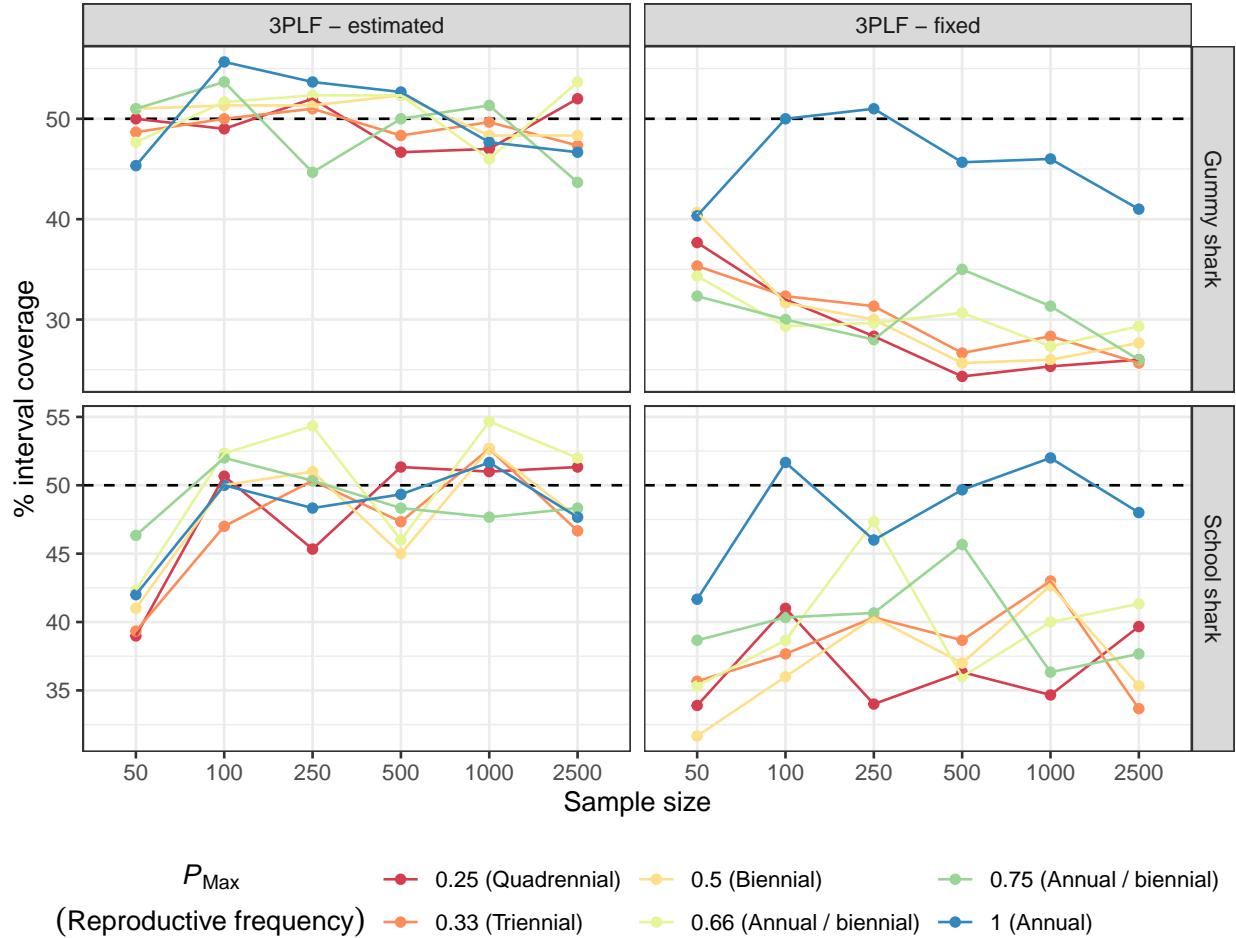


Figure 4. Confidence interval coverage for  $\hat{L}_{50}$  for 3PLF methods (high selectivity scenarios). Figure shows the percentage of simulations ( $n = 300$ ) where the true parameter value fell within the 50% bootstrap confidence interval.

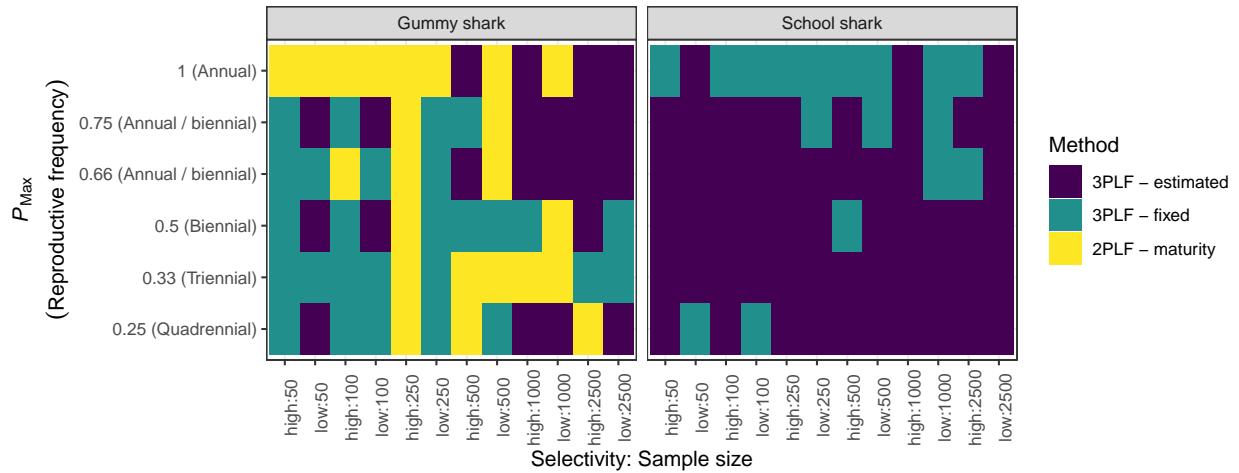


Figure 5. Performance of alternative maternity functions in minimising bias in calculations of  $R_0$ . The preferred method was that which minimised bias,  $|\text{relative error}|$  across 300 simulated datasets. Note 2PLF-maternity (Annual) scenarios were excluded for this comparison.

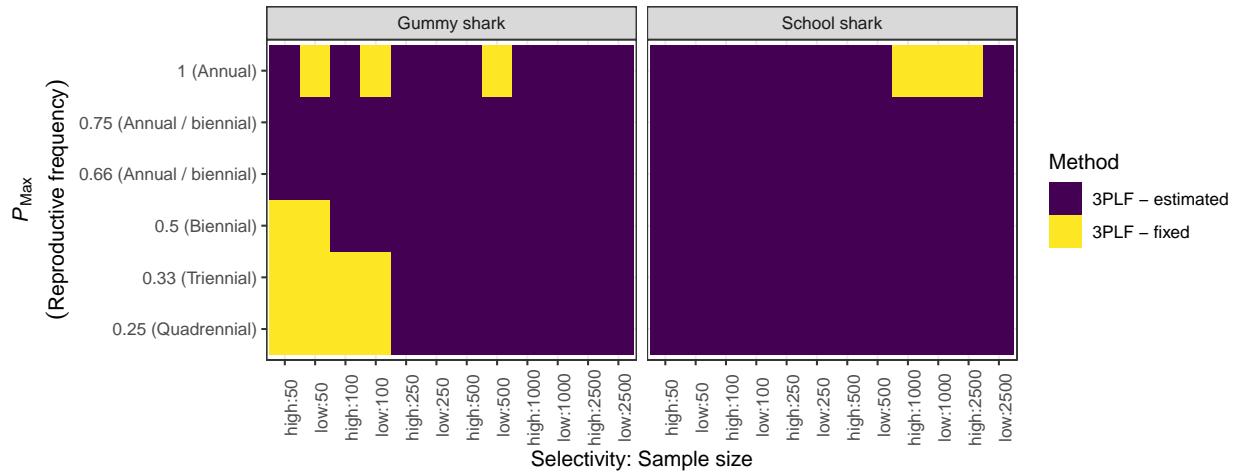


Figure 6. Performance of alternative maternity functions in accurately calculating  $R_0$ . The best performing method was that which minimised mean absolute error across 300 simulated datasets. Note 2PLF-maternity (Annual) scenarios were excluded for this comparison.

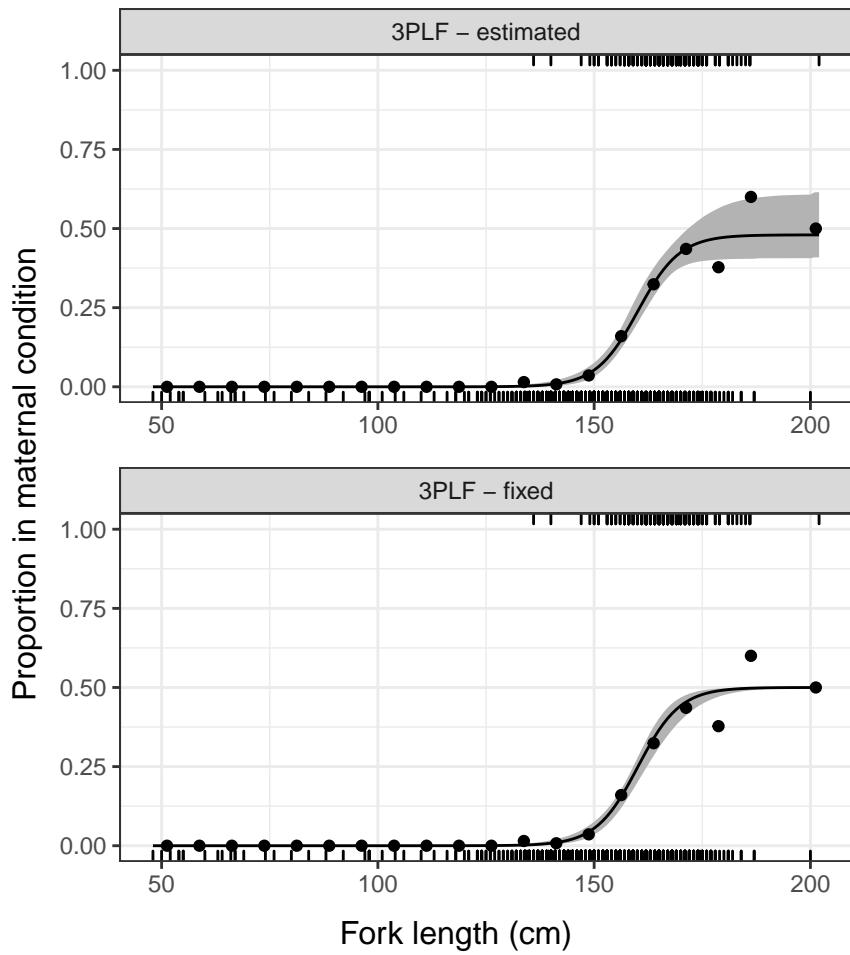


Figure 7. Comparison of 3PLF-estimated and 3PLF-fixed methods used to estimate maternal parameters for sandbar shark, *C. plumbeus*, in the Gulf of Mexico and Western North Atlantic. Solid line is the expected proportion in maternal condition at length,  $\Psi'(L)$ . The grey shaded region denotes 95% confidence intervals based on bootstrap resampling.  $P_{Max}$  was fixed at 0.5 in the lower panel