**Appendix S4**: Model diagnostics and variance-covariance matrix



Figure S4.1 – Posterior mean length versus observed length for lake trout (a), standardized residuals (b), and standardized residuals versus posterior mean length (c). Dashed blue line shows trend fitted with smoothing spline, dashed red line shows the zero-bias line.



Figure S4.2 – Observed (points) and posterior predictive distribution of size-at-age for six example lake trout populations that varied in sample size (N), and environmental features: degree-days (DD), total dissolved solids (TDS), prey fish species diversity, lake trout exploitation class (EC), and travel mode/distance. White circles show size-at-age of lake trout that lacked maturity data, blue squares show size-at-age of immature lake trout, orange triangles show size-at-age of mature lake trout. The 75% and 95% credible intervals shown in light and dark grey, respectively.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table S4.1 – Posterior mean standardized correlations (ρ) between life-history traits of lake trout in western Canada. Traits estimated using multivariate normal distribution and variance-covariance matrix. | | | | | |
|  |  |  |  |  |  |
|  | 1 | - | - | - | - |
|  | 0.43 | 1 | - | - | - |
|  | -0.23 | -0.05 | 1 | - | - |
|  | 0.27 | 0.09 | -0.84 | 1 | - |
|  | -0.33 | -0.29 | 0.83 | -0.71 | 1 |