***Supporting Information Appendix***

**Larger but younger fish when growth compensates for higher mortality in warmed ecosystem**

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Chart

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Fig. S1. Simulations from the prior predictive distribution for the VBGE model, where the solid line is the median and the shaded areas correspond to the 95%, 80% and 50% credible intervals.

A picture containing chart

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Fig. S2. von Bertalanffy growth equation: Traceplot to illustrate chain convergence for key (population-level) parameters (A), residuals (B), QQ-plot (C) and posterior predictive check (D).

Shape, arrow

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Fig. S3. Cohort-specific predictions (i.e., with cohort-varying and ). Points correspond to data, solid lines correspond to the median of the posterior prediction from the model and the shaded area corresponds to the 95% credible interval.

Chart, line chart, scatter chart

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Fig. S4. Posterior distributions of the cohort-varying parameter in the VBGE. Points correspond to the median and the horizontal lines correspond to the 95% credible interval. Note that the distributions of in the warm areas extend beyond the x-axis for cohorts 1995:1997 (also evident in Fig. S3). The range of the x-axis was set to be wide enough to include the posterior medians of the larger estimates but narrow enough to allow for comparison between the other cohorts and areas.

Chart

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Fig. S5. Posterior distributions of the cohort-varying parameter in the VBGE. Points correspond to the median and the horizontal lines correspond to the 95% credible interval.

A picture containing text, screenshot, appliance

Description automatically generated

Fig. S6. Simulations from the prior predictive distribution for the allometric growth model, where the solid line is the median and the shaded areas correspond to the 95%, 80% and 50% credible intervals.

Fig. S7. Allometric growth model: Traceplot to illustrate chain convergence for key (population-level) parameters (A), residuals (B), QQ-plot (C) and posterior predictive check (D).

Diagram

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Fig. S8 Catch curve model: Traceplot to illustrate chain convergence for key (population-level) parameters (A), residuals (B), QQ-plot (C) and posterior predictive check (D).

Chart

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Fig. S9. Posterior distributions of the cohort-varying slopes, where , the mortality rate, is the negative of the slope of natural log of catch per unit effort (CPUE) as a function of age). Points correspond to the median and the vertical lines correspond to the 95% credible interval.

Chart, diagram

Description automatically generated

Fig. S10. Size spectrum slopes vs year model: Traceplot to illustrate chain convergence for key (population-level) parameters (A), residuals (B), QQ-plot (C) and posterior predictive check (D).



Fig. S11. Example plot for the Biotest lake (the warm area) for 1995. To view corresponding size-spectrum plots for all years, we refer to the repository of this project (<https://github.com/maxlindmark/warm_life_history> and zenodo).



Fig. S12. Example plot for the Forsmark (the cold area) for year 1995. To view corresponding size-spectrum plots for all years, we refer to the repository of this project (<https://github.com/maxlindmark/warm_life_history> and zenodo).