**Supplementary Online Material 2: Type IV analysis of juvenile functional responses without high midge density observations**

for

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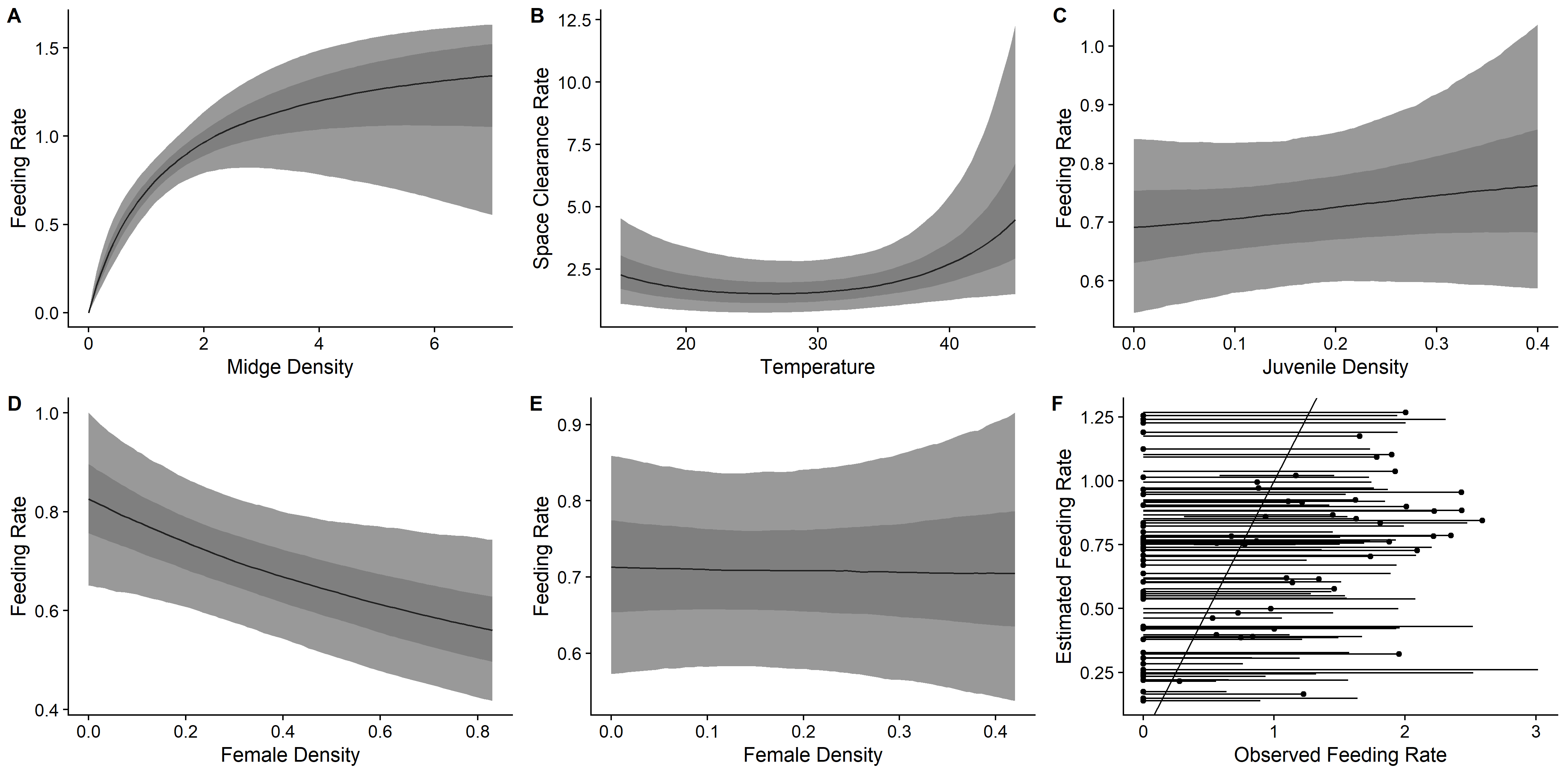
In the main text, our analysis suggests that juveniles may exhibit a Type IV or dome-shaped relationship between their feeding rates and midge densities. However, this relationship appears to be dependent on four surveys at high midge densities. To assess whether evidence for the dome-shaped relationship is dependent on the four surveys at high midge densities, we refit the parametric dome-shaped functional response to the data excluding the four surveys.

The dome-shaped functional response we used is the same as in the main text

eqn. S1.1

where is the feeding rate in survey , and is the temperature-dependent space clearance rate where , , and are parameters describing a potentially quadratic relationship between temperature, , and the space clearance rate, is the resource density in survey , is a parameter that is negative when the functional response is hump-shaped, is the detection/handling time for survey , and , , and are the interference rates associated with juvenile, female, and male densities , , and , respectively. As in the main text, we estimated the parameters of the functional response using Bayesian methods, with weakly informative or regularizing priors on each of the parameters. For , we used a Normal(mean = 10, standard deviation = 15) prior that was truncated at zero. For and and the interference parameters, we used Normal(mean = 0, standard deviation = 1) priors. We fit the functional response model using the program Stan through R using the package ‘rstan’ (Stan Development Team, 2021).

Without the four observations at the highest midge densities, there is no longer evidence for a dome-shaped or Type IV functional response (Figure S1.1A). The fit of the functional response showed an increasing, saturating relationship with midge densities. The parameters described a weak but possible unimodal, convex relationship between space clearance rates and temperature ( = 15.6, 90% CrI 2.8-36.3; = -0.17, 90% CrI -0.27- -0.05; = 0.003, 90% CrI 0.001-0.005). The model also estimated the interference rate associated with juvenile densities as -0.4 (90% CrI -2.1-1.3), the interference rate associated with females as 1.1 (90% CrI 0.04-2.3), the interference rate associated with males as 0.1 (90% CrI -1.2-1.6), and the parameter controlling the convexity of the relationship between feeding rates and midge densities as -0.05 (90% CrI -0.4-0.4).



**Figure S2.1 Parametric functional response predictions of juvenile feeding rate relationships with midge densities (A), juvenile densities (C), female densities (D) and male densities (E), and space clearance rate relationships with temperature (B) for the Type IV, Beddington-DeAngelis functional response. Lines in A-E represent predicted median feeding rates with all other variables at their across-survey means. The lighter and darker ribbons represent 90% and 50% credible intervals, respectively. Panel F shows model-predicted and observed feeding rates. The diagonal line is the 1:1 line and the horizontal lines are the model 90% prediction intervals of the observed feeding rates.**