

## Supplemental Figures

Figure S1: Length of size corrected pelvic spine length for wild fish from Paq and Ambrose lakes. Mean and standard error for each population are shown to the right of each lake in red. Data was taken from Miller et al. (2015). Modified pelvic spines were clipped to 2.5 mm in length.

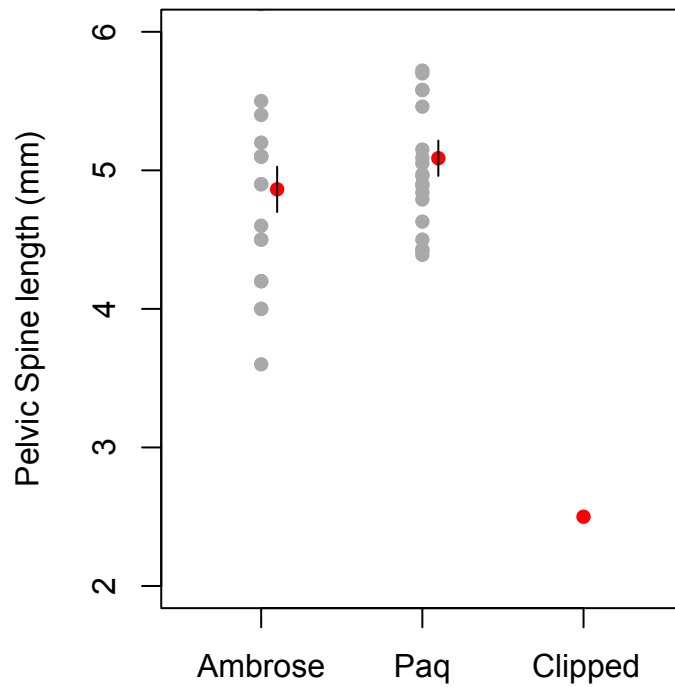


Figure S2: Funnel plot of standard error and the effect size of (A) fish predation experiments and (B) insect predation experiments used in the meta-analysis. Each point represents a single experiment. The insect predation experiments have a greater scatter of standard error. There is no evidence for publication bias in either plot.

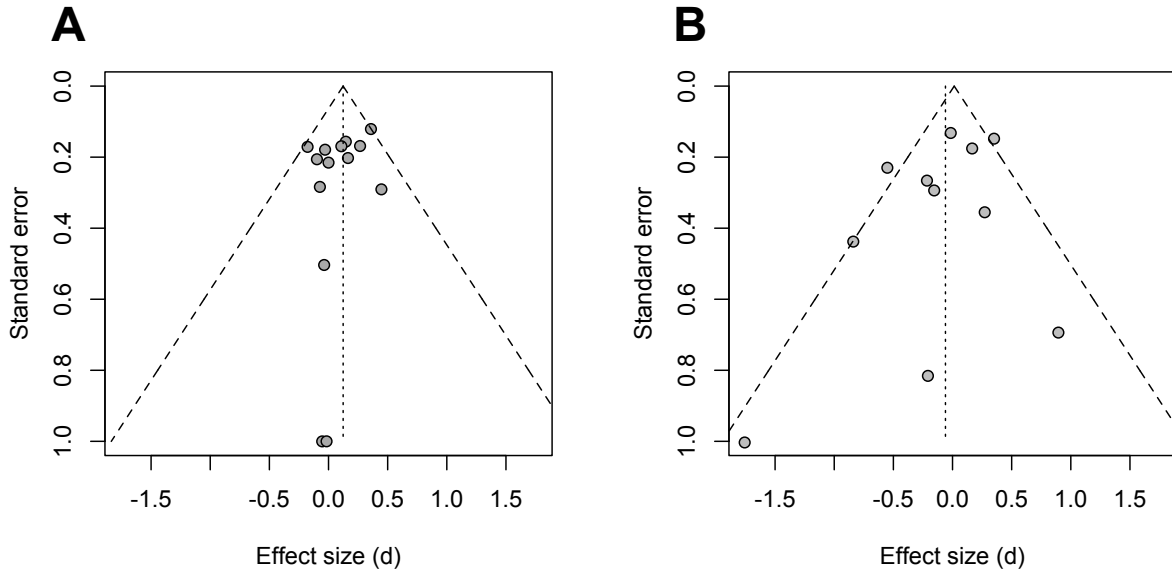


Figure S3: Forest plot of the effect size of all fish predation experiments on pelvic armor. The center of the grey box indicates the mean of the effect size ( $d$ ) for each experiment and the area of the grey box is proportional to the weight of that study in the meta-analysis. The horizontal lines span the 95% confidence interval of the effect. For studies containing multiple experiments, the mean effect size of each study was calculated using a fixed effects model. The weighted mean for all studies was calculated using the inverse variance method with a random effects model (Borenstein et al. 2009).  $W$  is the weight of the study in the model. The weighted mean effect is indicated by the vertical dotted line and the 95% confidence interval of this estimate is contained within the black diamond. A positive effect size indicates that individuals with longer spines were more likely to survive.

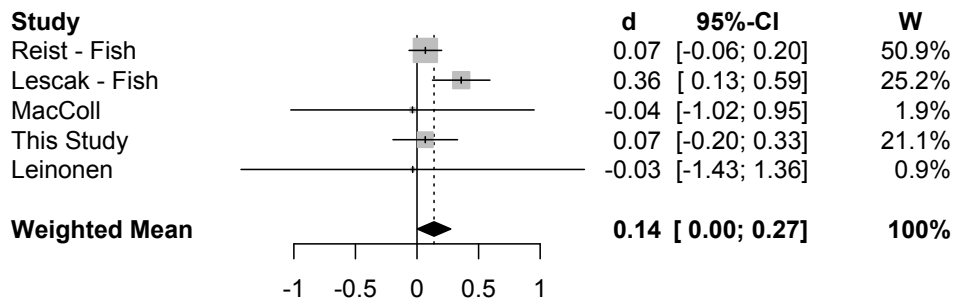


Figure S4: Forest plot of the effect size of all insect predation studies on pelvic armor. The center of the grey box indicates the mean of the effect size ( $d$ ) for each experiment and the area of the grey box is proportional to the weight of that study in the meta-analysis. The horizontal lines span the 95% confidence interval of the effect. For studies containing multiple experiments, the mean effect size of each study was calculated using a fixed effects model. The weighted mean for all studies was calculated using the inverse variance method with a random effects model (Borenstein et al. 2009).  $W$  is the weight of the study in the model. The weighted mean effect is indicated by the vertical dotted line and the 95% confidence interval of this estimate is contained within the black diamond. A positive effect size indicates that individuals with longer spines were more likely to survive.

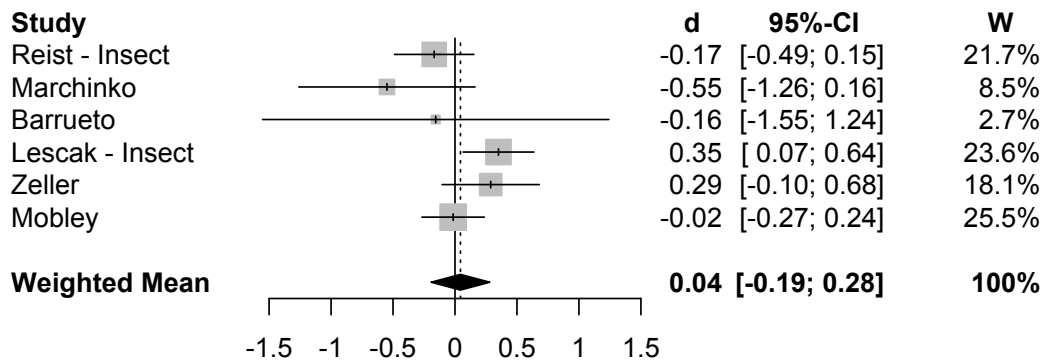
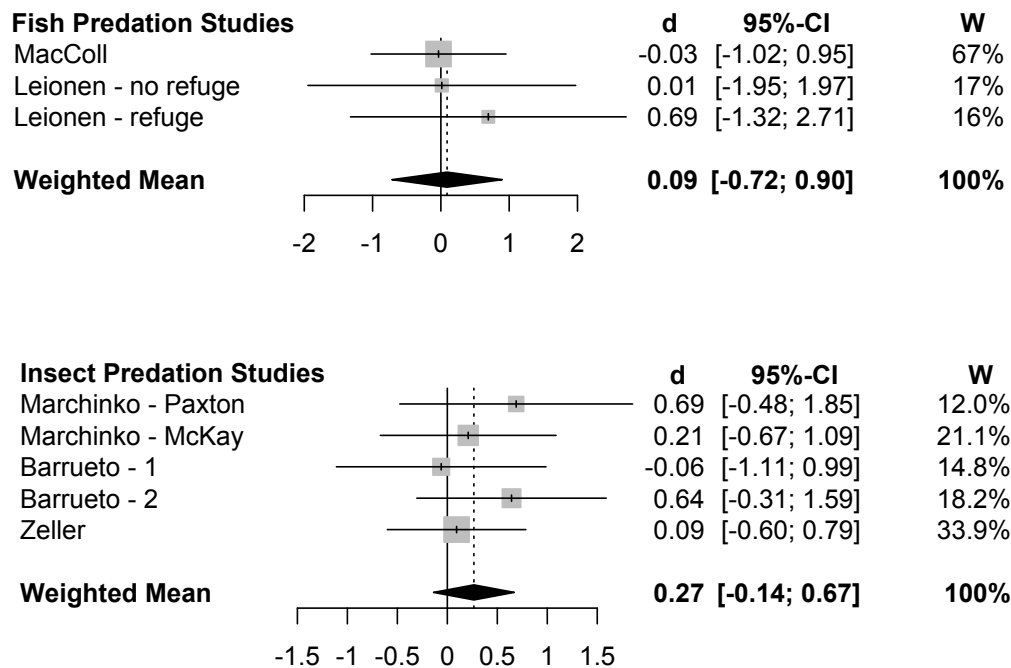


Figure S5: Forest plot of the effect size of all predation experiments on body size (standard length). A random effects model was run separately on fish and insect predation studies. The center of the grey box indicates the mean of the effect size ( $d$ ) for each experiment and the area of the grey box is proportional to the weight of that study in the meta-analysis. The horizontal lines span the 95% confidence interval of the effect. The weighted mean was calculated using a random effects model (Borenstein et al. 2009).  $W$  is the weight of the study in the model. The weighted means are indicated by the vertical dotted lines and the 95% confidence interval of this estimate is contained within the black diamonds. A positive effect size indicates that larger individuals were more likely to survive.



References:

Borenstein M., Hedges, L.V., Higgins, J.P.T., & Rothstein, H.R. 2009. Introduction to meta-analysis. Wiley and Sons Ltd, Chichester, U.K.

Miller, S.E., Metcalf, D., & Schluter, D. 2015. Intraguild predation leads to genetically based character shifts in the threespine stickleback. *Evolution* 69:3194–3203.

Table S1: Data from mesocosm experimental trials. Clipped fish had both pelvic spines clipped to 2.5 mm prior to the start of the experiment whereas unclipped fish have unmodified pelvic spines. All lengths are in mm. Odds ratios were calculated after a 0.5 correction value was added to each category to avoid zero values.

| Tank | Lake    | start mean length clipped | start mean length unclipped | sculpin standard length | N Surviving clipped | N Surviving unclipped | N total | mean length survived | clipped dead | clipped alive | unclipped dead | unclipped alive | logodds |
|------|---------|---------------------------|-----------------------------|-------------------------|---------------------|-----------------------|---------|----------------------|--------------|---------------|----------------|-----------------|---------|
| 11A  | Ambrose | 46.25                     | 46                          | 101                     | 3                   | 1                     | 4       | 44.8                 | 1.5          | 3.5           | 3.5            | 1.5             | -1.695  |
| 12A  | Ambrose | 52.75                     | 53                          | 104                     | 1                   | 3                     | 4       | 52.3                 | 3.5          | 1.5           | 1.5            | 3.5             | 1.695   |
| 13A  | Ambrose | 54.75                     | 55.5                        | 97                      | 2                   | 3                     | 5       | 54.8                 | 2.5          | 2.5           | 1.5            | 3.5             | 0.847   |
| 14A  | Ambrose | 49.75                     | 50                          | 95                      | 4                   | 4                     | 8       | 50.4                 | 0.5          | 4.5           | 0.5            | 4.5             | 0       |
| 15A  | Ambrose | 59.75                     | 61.5                        | 105                     | 0                   | 3                     | 3       | 62.3                 | 4.5          | 0.5           | 1.5            | 3.5             | 3.0445  |
| 16A  | Ambrose | 51.75                     | 52.75                       | 98                      | 3                   | 1                     | 4       | 50.25                | 1.5          | 3.5           | 3.5            | 1.5             | -1.695  |
| 17A  | Ambrose | 44                        | 43.75                       | 94                      | 2                   | 2                     | 4       | 52.25                | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 18A  | Ambrose | 49                        | 49.25                       | 98                      | 4                   | 1                     | 5       | 49                   | 0.5          | 4.5           | 3.5            | 1.5             | -3.045  |
| 19A  | Ambrose | 47.5                      | 46.75                       | 84                      | 2                   | 2                     | 4       | 45.5                 | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 20A  | Ambrose | 53                        | 53.25                       | 102                     | 2                   | 3                     | 5       | 53                   | 2.5          | 2.5           | 1.5            | 3.5             | 0.8473  |
| 1A   | Paq     | 41.5                      | 43                          | 105                     | 2                   | 2                     | 4       | 43.25                | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 2A   | Paq     | 47                        | 47                          | 105                     | 2                   | 2                     | 4       | 44.75                | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 3A   | Paq     | 43.75                     | 44.25                       | 95                      | 2                   | 3                     | 5       | 45.8                 | 2.5          | 2.5           | 1.5            | 3.5             | 0.8473  |
| 4A   | Paq     | 38.5                      | 38.5                        | 99                      | 0                   | 3                     | 3       | 39.3                 | 4.5          | 0.5           | 1.5            | 3.5             | 3.0445  |
| 5A   | Paq     | 36.5                      | 36.75                       | 96                      | 2                   | 2                     | 4       | 39                   | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 6A   | Paq     | 38.25                     | 38                          | 93                      | 2                   | 3                     | 5       | 38.8                 | 2.5          | 2.5           | 1.5            | 3.5             | 0.8473  |
| 7A   | Paq     | 41                        | 40.25                       | 98                      | 2                   | 2                     | 4       | 41                   | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 8A   | Paq     | 44                        | 45.25                       | 102                     | 2                   | 2                     | 4       | 43                   | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 9A   | Paq     | 37.75                     | 37.75                       | 90                      | 3                   | 2                     | 5       | 40.2                 | 1.5          | 3.5           | 2.5            | 2.5             | -0.847  |
| 10A  | Paq     | 39.5                      | 40                          | 101                     | 3                   | 1                     | 4       | 41                   | 1.5          | 3.5           | 3.5            | 1.5             | -1.695  |
| 1B   | Paq     | 43                        | 43                          | 105                     | 1                   | 1                     | 2       | 43                   | 3.5          | 1.5           | 3.5            | 1.5             | 0       |
| 3B   | Paq     | 39.5                      | 38.75                       | 95                      | 3                   | 2                     | 5       | 38.6                 | 1.5          | 3.5           | 2.5            | 2.5             | -0.847  |
| 5B   | Paq     | 39.25                     | 38                          | 96                      | 2                   | 2                     | 4       | 39.5                 | 2.5          | 2.5           | 2.5            | 2.5             | 0       |
| 7B   | Paq     | 37.25                     | 37.5                        | 98                      | 2                   | 3                     | 5       | 39                   | 2.5          | 2.5           | 1.5            | 3.5             | 0.8473  |
| 8B   | Paq     | 47.25                     | 47                          | 102                     | 0                   | 3                     | 3       | 45.7                 | 4.5          | 0.5           | 1.5            | 3.5             | 3.0445  |
| 12B  | Paq     | 45.5                      | 44.75                       | 104                     | 4                   | 3                     | 7       | 44.3                 | 0.5          | 4.5           | 1.5            | 3.5             | -1.35   |