|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Term** | **N** | **Estimate** | **95% CI** | **P** | **R2** |
| a) Group vs. solo foraging |  |  |  |  |  |  |
| **Fixed effects** |  |  |  |  |  | 0.03 |
|  | **(Intercept)** | 3,010 | -0.53 | -1.1, 0.05 | 0.073 |  |
|  | **Year** |  |  |  | **<0.001** |  |
|  | *year1* | 758 | — | — |  |  |
|  | *year2* | 1,075 | 0.60 | 0.26, 0.94 | **<0.001** |  |
|  | *year3* | 1,177 | 0.60 | 0.27, 0.93 | **<0.001** |  |
|  | **Current** | 3,010 | 0.19 | -0.01, 0.38 | 0.058 |  |
|  | **Time to high tide** | 3,010 | -0.24 | -0.35, -0.12 | **<0.001** |  |
|  | **Plankton** |  |  |  | 0.55 |  |
|  | *0* | 431 | — | — |  |  |
|  | *1* | 990 | -0.16 | -0.45, 0.13 | 0.27 |  |
|  | *2* | 1,589 | -0.14 | -0.45, 0.18 | 0.39 |  |
|  | **Number of mantas** | 3,010 | 0.23 | 0.11, 0.36 | **<0.001** |  |
| **Random effects** |  |  |  |  |  |  |
|  | sdi | 3,010 | 0.73 |  | **<0.005** | 0.11 |
|  | sdsite | 3,010 | 0.34 |  | **<0.01** | 0.02 |
| b) Group size |  |  |  |  |  |  |
| **Fixed effects** |  |  |  |  |  | 0.05 |
|  | **(Intercept)** | 1,727 | 1.6 | 1.4, 1.9 | **<0.001** |  |
|  | **Year** |  |  |  | **<0.001** |  |
|  | *year1* | 406 | — | — |  |  |
|  | *year2* | 658 | -0.33 | -0.43, -0.22 | **<0.001** |  |
|  | *year3* | 663 | 0.01 | -0.09, 0.11 | 0.84 |  |
|  | **Current** | 1,727 | -0.14 | -0.20, -0.08 | **<0.001** |  |
|  | **Time to high tide** | 1,727 | -0.01 | -0.04, 0.03 | 0.70 |  |
|  | **Plankton** |  |  |  | **<0.001** |  |
|  | *0* | 230 | — | — |  |  |
|  | *1* | 522 | -0.19 | -0.28, -0.10 | **<0.001** |  |
|  | *2* | 975 | 0.00 | -0.10, 0.09 | 0.92 |  |
|  | **Number of mantas** | 1,727 | 0.13 | 0.09, 0.16 | **<0.001** |  |
| **Random effects** |  |  |  |  |  |  |
|  | sdi | 1,727 | 0.22 |  | **<0.05** | 0.06 |
|  | sdsite | 1,727 | 0.24 |  | **<0.005** | 0.09 |
| c) Group leadership |  |  |  |  |  |  |
| **Fixed effects** |  |  |  |  |  | 0.01 |
|  | **(Intercept)** | 1,760 | -0.78 | -0.97, -0.59 | **<0.001** |  |
|  | **Sex** |  |  |  | **0.016** |  |
|  | *F* | 1,215 | — | — |  |  |
|  | *M* | 545 | -0.36 | -0.65, -0.07 | **<0.05** |  |
|  | **Maturity** |  |  |  | 0.57 |  |
|  | *1* | 1,115 | — | — |  |  |
|  | *2* | 645 | 0.08 | -0.19, 0.35 | 0.57 |  |
|  | **Shark bites** |  |  |  | 0.54 |  |
|  | *0* | 1,557 | — | — |  |  |
|  | *1* | 203 | 0.13 | -0.27, 0.52 | 0.54 |  |
|  | **Anthropogenic injury** |  |  |  | 0.39 |  |
|  | *0* | 1,392 | — | — |  |  |
|  | *1* | 368 | -0.15 | -0.48, 0.19 | 0.39 |  |
| **Random effects** |  |  |  |  |  |  |
|  | sdi | 1,760 | 0.52 |  | **<0.005** | 0.05 |

Table 1. Model coefficients for Generalized Linear Mixed Models of environmental covariates influence on group foraging (a), group size (b) and group leadership (c). Group foraging and group leadership were fitted with Binomial error and Poisson error for group size. P-values for each fixed effect term were calculated using type III sums or squares. For random effects, R2 and P-values were calculated using 1000 bootstraps and permutation tests respectively.