**Supplementary Material**

African Penguin tolerance to humans depends on historical exposure at colony level

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**Contents**

Table S1. Results of Tukey post-hoc tests on the GLMMs and GLMs comparing behavioural responses (GLMMs for proportion of time spent alert and/or threatening and number of aggressive events, and GLM for number of head turns) of breeding African penguins between colonies exposed to different human exposures and between breeding stages before, during and after a single pedestrian approach.

Table S2. Results of Tukey post-hoc tests on the GLMMs and GLMs comparing behavioural responses (GLMMs for proportion of time spent alert and/or threatening and number of aggressive events, and GLM for number of head turns) of breeding African penguins between areas of low and high levels of human exposure at Boulders and Bird Island colonies, and between breeding stages before, during and after a single pedestrian approach.

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Alertness** | | **Aggressive events** | | **Head turns** | |
|  | *Z* | *P* | *Z* | *P* | *Z* | *P* |
| BouldersDURING - BouldersBEFORE | 2.69 | 0.135 | 5.47 | **<0.001** |  |  |
| BouldersAFTER - BouldersBEFORE | -0.17 | 1.000 | -1.98 | 0.456 |  |  |
| BirdBEFORE - BouldersBEFORE | 1.74 | 0.743 | -4.81 | **<0.001** |  |  |
| RobbenBEFORE - BouldersBEFORE | 2.83 | 0.094 | nd | |  |  |
| St CroixBEFORE - BouldersBEFORE | **4.06** | **<0.01** | -5.47 | **<0.001** |  |  |
| BouldersAFTER - BouldersDURING | -2.63 | 0.157 | -6.96 | **<0.001** |  |  |
| BirdDURING - BouldersDURING | **4.64** | **<0.001** | 0.32 | 1.000 | 30.08 | **<0.001** |
| RobbenDURING - BouldersDURING | **4.70** | **<0.001** | -5.18 | **<0.001** | 27.39 | **<0.001** |
| St CroixDURING - BouldersDURING | **5.10** | **<0.001** | 3.39 | 0.012 | 34.22 | **<0.001** |
| BirdAFTER - BouldersAFTER | 2.68 | 0.142 | -4.42 | **<0.001** |  |  |
| RobbenAFTER - BouldersAFTER | **3.67** | **<0.001** | -4.14 | **<0.001** |  |  |
| St CroixAFTER - BouldersAFTER | **4.94** | **<0.001** | nd | |  |  |
| BirdDURING - BirdBEFORE | **5.50** | **<0.001** | 6.11 | **<0.001** |  |  |
| BirdAFTER - BirdBEFORE | 1.71 | 0.764 | 0.44 | 1.000 |  |  |
| RobbenBEFORE - BirdBEFORE | 1.87 | 0.649 | nd | |  |  |
| St CroixBEFORE - BirdBEFORE | **4.17** | **<0.001** | 0.23 | 1.000 |  |  |
| BirdAFTER - BirdDURING | **-4.48** | **<0.001** | -6.76 | **<0.001** |  |  |
| RobbenDURING - BirdDURING | 0.34 | 1.000 | -5.63 | **<0.001** | -3.94 | **<0.001** |
| St CroixDURING - BirdDURING | 1.10 | 0.987 | 3.32 | 0.014 | 6.91 | **<0.001** |
| RobbenAFTER - BirdAFTER | 2.38 | 0.282 | -0.39 | 1.000 |  |  |
| St CroixAFTER - BirdAFTER | **4.86** | **<0.001** | nd | |  |  |
| RobbenDURING - RobbenBEFORE | **4.35** | **<0.001** | nd | |  |  |
| RobbenAFTER - RobbenBEFORE | 2.16 | 0.429 | nd | |  |  |
| St CroixBEFORE - RobbenBEFORE | 2.63 | 0.158 | nd | |  |  |
| RobbenAFTER - RobbenDURING | -2.60 | 0.172 | -4.79 | <0.001 |  |  |
| St CroixDURING - RobbenDURING | 0.75 | 1.000 | 8.41 | <0.001 | 10.71 | <0.001 |
| St CroixAFTER - RobbenAFTER | 2.96 | 0.064 | nd | |  |  |
| St CroixDURING - St CroixBEFORE | 2.89 | 0.081 | 7.73 | <0.001 |  |  |
| St CroixAFTER - St CroixBEFORE | 2.64 | 0.155 | nd | |  |  |
| St CroixAFTER - St CroixDURING | -0.39 | 1.000 | nd | |  |  |

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Alertness** | | **Aggressive events** | | **Head turns** | |
|  | *Z* | *P* | *Z* | *P* | *Z* | *P* |
| BouldersHighDURING - BouldersHighBEFORE | 2.09 | 0.469 | 1.26 | 0.926 | nd | |
| BouldersHighAFTER - BouldersHighBEFORE | -0.20 | 1.000 | -2.05 | 0.419 | nd | |
| BouldersLowBEFORE - BouldersHighBEFORE | -0.09 | 1.000 | 0.05 | 1.000 | nd | |
| BirdHighBEFORE - BouldersHighBEFORE | 1.21 | 0.970 | **-3.76** | **<0.01** | nd | |
| BirdLowBEFORE - BouldersHighBEFORE | 1.65 | 0.797 | nd | | nd | |
| BouldersHighAFTER - BouldersHighDURING | -2.05 | 0.501 | -3.22 | 0.022 | nd | |
| BouldersLowDURING - BouldersHighDURING | 1.01 | 0.993 | **6.30** | **<0.01** | 1.92 | 0.206 |
| BirdHighDURING - BouldersHighDURING | **3.73** | **<0.01** | **3.58** | **<0.01** | **25.13** | **<0.001** |
| BirdLowDURING - BouldersHighDURING | **3.60** | **<0.001** | **5.00** | **<0.001** | **23.91** | **<0.001** |
| BouldersLowAFTER - BouldersHighAFTER | 0.08 | 1.000 | 0.93 | 0.989 | nd | |
| BirdHighAFTER - BouldersHighAFTER | 1.98 | 0.555 | -3.00 | 0.042 | nd | |
| BirdLowAFTER - BouldersHighAFTER | 2.52 | 0.200 | nd | | nd | |
| BouldersLowDURING - BouldersLowBEFORE | 1.64 | 0.801 | **6.04** | **<0.001** | nd | |
| BouldersLowAFTER - BouldersLowBEFORE | 0.01 | 1.000 | -0.39 | 1.000 | nd | |
| BirdHighBEFORE - BouldersLowBEFORE | 0.84 | 0.999 | **-3.55** | **<0.01** | nd | |
| BirdLowBEFORE - BouldersLowBEFORE | 1.11 | 0.985 | nd | | nd | |
| BouldersLowAFTER - BouldersLowDURING | -1.65 | 0.796 | **-6.15** | **<0.001** | nd | |
| BirdHighDURING - BouldersLowDURING | 2.17 | 0.412 | **-3.74** | **<0.01** | **15.89** | **<0.001** |
| BirdLowDURING - BouldersLowDURING | 2.56 | 0.183 | -2.26 | 0.289 | **15.68** | **<0.001** |
| BirdHighAFTER - BouldersLowAFTER | 1.28 | 0.955 | -3.29 | 0.017 | nd | |
| BirdLowAFTER - BouldersLowAFTER | 1.67 | 0.780 | nd | | nd | |
| BirdHighDURING - BirdHighBEFORE | **4.15** | **<0.001** | **5.07** | **<0.001** | nd | |
| BirdHighAFTER - BirdHighBEFORE | 1.11 | 0.985 | 0.44 | 1.000 | nd | |
| BirdLowBEFORE - BirdHighBEFORE | 0.63 | 1.000 | nd | | nd | |
| BirdHighAFTER - BirdHighDURING | **-3.60** | **<0.01** | **-5.49** | **<0.001** | nd | |
| BirdLowDURING - BirdHighDURING | 0.94 | 0.996 | 1.82 | 0.592 | 0.15 | 0.999 |
| BirdLowAFTER - BirdHighAFTER | 1.15 | 0.979 | nd | | nd | |
| BirdLowDURING - BirdLowBEFORE | 3.51 | 0.010 | nd | | nd | |
| BirdLowAFTER - BirdLowBEFORE | 1.33 | 0.941 | nd | | nd | |
| BirdLowAFTER - BirdLowDURING | -2.64 | 0.151 | nd | | nd | |