**Appendix S3. Supporting information**

**Table A1:** Summary of top 5 candidate models investigating the effects of a range of key environmental variables on the probability of detecting a seabird population response (all responses; colony growth; recolonization) after predator removal on islands, controlled for island and species. Models were ranked by Akaike weights (*w*i) based on comparisons of AIC values corrected for small sample size (**Δ** QAICc)

**Model ΔQAICc wi**

**All seabird responses (colony growth, re-colonization combined) n = 96**

Distance to source 0.00 0.20

Population size + Distance to source + Population status 0.25 0.17

Population size + Distance to source + Population status + Number of other spp. breeding 0.88 0.13

Age at first breeding + Population size + Distance to source + Population status 1.00 0.12

Distance to source + Population status 1.26 0.11

**Colony growth n = 47**

Population size + Population status 0.00 0.13

Intercept 0.05 0.13

Distance to source 0.05 0.13

Population size + Population status + Years since eradication 0.43 0.11

Population size + Population status + Habitat modification 0.88 0.09

**Re-colonization n = 50**

Years since eradication + Distance to source + Number of other spp. breeding 0.00 0.58

Years since eradication + Distance to source + Population status + Number of other spp. breeding 1.48 0.28

Years since eradication + Habitat modification + Number of other spp. breeding 5.77 0.03

Years since eradication + Distance to source + Competition + Age at first breeding + Population status 6.45 0.02

Distance to source + Habitat modification + Competition + Age at first breeding + Population status 7.32 0.01