**Table S2**: Equation numbers and definitions for all parameters estimated using the Bayesian Method for both a) the detection function and b) habitat function.

|  |  |
| --- | --- |
| Parameter | Definition |
| a)$$σ\_{0}$$ | Intercept term for the scale term from the distance sampling (DS) component of the detection function for the hazard arte detection functions |
| $$σ\_{B}$$ | Coefficient for the effect of beaufort sea state on detection probability for scale term from the distance sampling (DS) component of the detection function |
| $$σ\_{S}$$ | Coefficient for the effect of subjective weather conditions on detection probability scale from the distance sampling (DS) component of the detection function |
| *b* | Shape parameter for the hazard rate function |
| α1 | Marginal detection probability for team 1 from the mark-recapture (MR) component of the detection function |
| α2 | Marginal detection probability for team 2 from the mark-recapture (MR) component of the detection function |
| αD | Relationship between distance and detection probability from the mark-recapture (MR) component of the detection function |
| b) |  |
| β0 | Intercept term for the linear predictor of the habitat function |
| βD125\_1 | First coefficient for distance to the 125 meter isobath (D125) from the linear predictor used to parameterize the habit function |
| βD125\_2 | Second coefficient for distance to the 125 meter isobath (D125) from the linear predictor used to parameterize the habit function |
| βD125\_3 | Third coefficient for distance to the 125 meter isobath (D125) from the linear predictor used to parameterize the habit function |
| βD125\_4 | Fourth coefficient for distance to the 125 meter isobath (D125) from the linear predictor used to parameterize the habit function |
| ΒDEPTH1 | First coefficient for depth (DEPTH) from the linear predictor used to parameterize the habit function |
| ΒDEPTH2 | Second coefficient for depth (DEPTH) from the linear predictor used to parameterize the habit function |
| ΒDEPTH3 | Third coefficient for depth (DEPTH) from the linear predictor used to parameterize the habit function |
| ΒDEPTH4 | Fourth coefficient for depth (DEPTH) from the linear predictor used to parameterize the habit function |
| ΒDIST2SHORE1 | First coefficient for distance to the coast line (DIST2SHORE) from the linear predictor used to parameterize the habit function |
| βDIST2SHORE2 | Second coefficient for distance to the coast line (DIST2SHORE) from the linear predictor used to parameterize the habit function |
| βDIST2SHORE3 | Third coefficient for distance to the coast line (DIST2SHORE) from the linear predictor used to parameterize the habit function |
| βDIST2SHORE4 | Fourth coefficient for distance to the coast line (DIST2SHORE) from the linear predictor used to parameterize the habit function |
| βSST1 | First coefficient for sea surface temperature (SST) from the linear predictor used to parameterize the habit function |
| βSST2 | Second coefficient for sea surface temperature (SST) from the linear predictor used to parameterize the habit function |
| βSST3 | Third coefficient for sea surface temperature (SST) from the linear predictor used to parameterize the habit function |
| βSST4 | Fourth coefficient for sea surface temperature (SST) from the linear predictor used to parameterize the habit function |