

Appendix 2

Capture model

Before fitting the GAM modelling the count of new RCRC captured per session, we explored the response of each of the variables separately with a GAM or GLM (Figure A2.1).

- a) **Year** (Figure A2.1a). A general decline in the overall number of birds is observed over the 20 years of the dataset. However, this trend was not estimated to be realistic but possibly due to change in survey effort or net location. Year was included as a random fixed effect.
- b) **Day-of-year** (Figure A2.1b). Day-of-year has a strong influence on the number of captures and varies non-linearly. This variable is thus included in the model as a smoothing term.
- c) **Duration** (Figure A2.1c). The duration of the session computed as the difference between closing time and opening time shows a positive correlation with the number of captures. It is thus included in the model as a linear term.
- d) **Net opening time** (Figure A2.1d). The fit of the opening time seems to indicate a higher capture rate for sessions starting later. This relationship is contrary to common knowledge and considered non-meaningful. It is thus not retained for the model.
- e) **Sum of net lengths** (Figure A2.1e). Between 50 and 200m, the fit shows an increase of captures as the total length of the nets increases. Yet, above 200m, the fit shows a stabilisation of the count. This is explained by the fact that the nets added above 200m are located in habitats which are not ideal for RCRC and thus do not contribute to an increase in capture. This term is included as a smoothing term.
- f) **Weather categories** (Figure A2.1f). The weather categories do not show a clear pattern and are thus not included in the model.

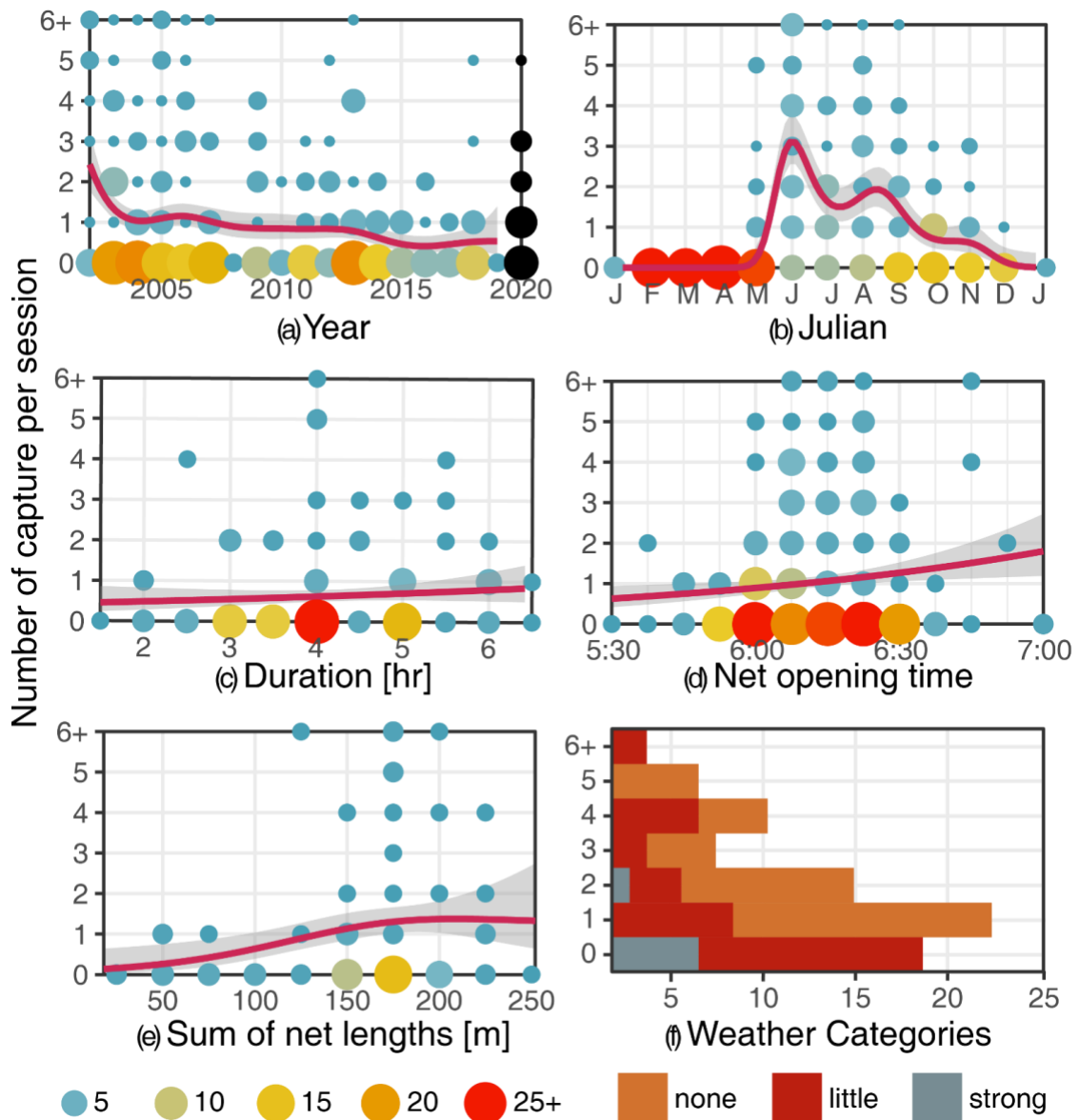


Figure A2.1: Number of RCRC captured by session as a function of (a) total length of nets, (b) duration of capture session, (c) weather category and (d) time of session start. The red line with shaded area is a smoothed curved fitted on the data (GAM or GLM)

We provide the model fit summary for the final model (Box A2-1) and the model including all variables possible (Box A2-2)

Box A2-1: Model fit summary including all variables

Family: poisson
 Link function: log

Formula:
 $\text{CountFoY} \sim s(\text{Year}, \text{bs} = "re") + s(\text{DayOfYear}) + \text{NetsDuration} + \text{NetsLength} + \text{CumCountFoY}$

Parametric coefficients:				
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.045689	0.486146	-2.151	0.03148 *
NetsDuration	-0.187815	0.067547	-2.780	0.00543 **
NetsLength	0.008530	0.001586	5.378	7.54e-08 ***
CumCountFoY	-0.032821	0.016956	-1.936	0.05291 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
Approximate significance of smooth terms:				
	edf	Ref.df	Chi.sq	p-value
s(Year)	11.398	17.000	59.11	<2e-16 ***
s(DayOfYear)	7.683	8.483	49.79	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
R-sq.(adj) = 0.506 Deviance explained = 55.3%				
UBRE = 0.1729 Scale est. = 1 n = 218				

Box A2-2: Model fit summary including all variables

Family: poisson				
Link function: log				
Formula:				
CountFoY ~ s(Year, bs = "re") + s(DayOfYear) + NetsDuration + NetsLength + CumCountFoY + WeatherCat + NetsOpen				
Parametric coefficients:				
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.189854	2.625865	0.834	0.40431
NetsDuration	-0.207513	0.069385	-2.991	0.00278 **
NetsLength	0.009492	0.001698	5.589	2.29e-08 ***
CumCountFoY	-0.036019	0.017505	-2.058	0.03962 *
WeatherCatlittle	0.322829	0.175153	1.843	0.06531 .
WeatherCatstrong	0.022859	0.323731	0.071	0.94371
NetsOpen	-0.561870	0.436665	-1.287	0.19819

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
Approximate significance of smooth terms:				
	edf	Ref.df	Chi.sq	p-value
s(Year)	11.868	17.000	59.46	<2e-16 ***
s(DayOfYear)	8.002	8.673	43.16	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
R-sq.(adj) = 0.529 Deviance explained = 57%				
UBRE = 0.17087 Scale est. = 1 n = 218				

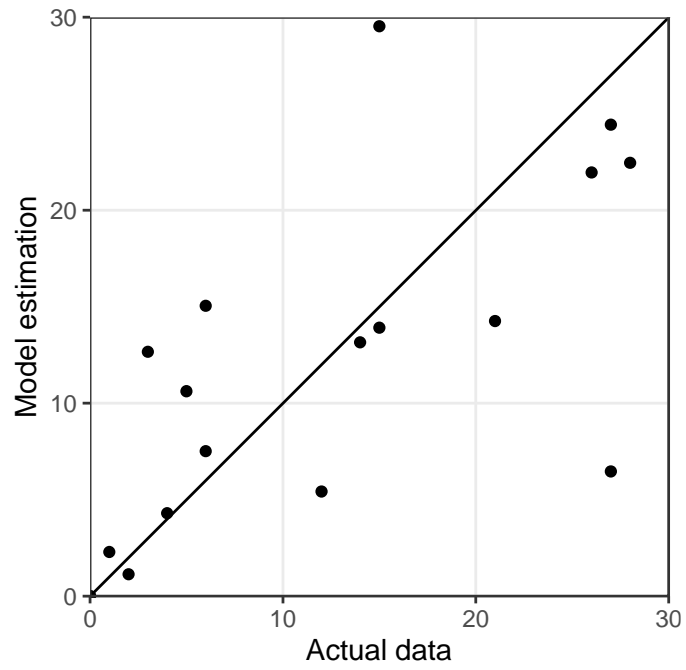


Figure A2.1: Comparison of the total number of new Red-capped Robin Chat caught per year between the model estimation and the data.