

Appendix 1. The strength of the relationship between herbivore and predator species and substrate, fire and rainfall explanatory variables. For each species the percentage of deviance captured by each variable fitted separately is shown. Entire study area: null model DF=206, residual deviance= 167.7. Reduced study area, Tennant and the Granites zone: null model DF=139, residual deviance=131.4.

Variable	Abbreviation	DF	Entire study area		Reduced study area Tennant and the Granites zone	
			deviance	Prob (Chi)	deviance	Prob (Chi)
Introduced herbivores						
herbivore richness	herbvar	1	0.1	0.8	0.7	0.4
camel occurrence	cameloc	1	1.6	0.2	0.004	0.9
camel probability	camelpr	1	7.9	0.005	0.8	0.4
substrate map 5 category (d,c,l,r,s)	sm5(d,c,l,r,s)	4	22.8	0.0001	19.3	0.0007
substrate map 3 category (dc,l,r,s)	sm3(dc,l,r,s)	2	19.7	0.00005	17.2	0.0002
substrate map 2 category (dcl,r,s)	sm2(dcl,r,s)	1	5.6	0.02	6.4	0.01
substrate map 2 category (lr,dcs)	sm2(lr,dcs)	1	17.9	0.00002	15.5	0.00008
substrate distance to drainage+calcrete	sdist.dc	1	2.7	0.1	0.09	0.7
substrate distance to calcrete	sdist.c	1	0.8	0.3	1.1	0.3
substrate distance to drainage	sdist.d	1	0.04	0.8	1.2	0.2
substrate distance to laterite	sdist.l	1	0.04	0.8	2.1	0.1
substrate distance to rock feature	sdist.r	1	0.5	0.5	9.0	0.003
substrate distance to sand plain+dune	sdist.s	1	0.8	0.4	0.7	0.4
substrate neighbourhood variety 1 km r	snbr1r	1	3.0	0.08	2.2	0.1
substrate neighbourhood variety 2.5 km r	snbr2.5r	1	7.8	0.005	9.6	0.002
substrate neighbourhood variety 5 km r	snbr5r	1	2.1	0.1	4.5	0.03
substrate neighbourhood variety 10 km r	snbr10r	1	1.2	0.2	6.2	0.01
substrate neighbourhood variety 25 km r	snbr25r	1	0.6	0.4	4.4	0.04
Introduced predators						
cat occurrence	catoc	1	0.1	0.7	0.004	0.9
fox occurrence	foxoc	1	1.8	0.2	0.1	0.7
dingo occurrence	dingooc	1	2.6	0.1	2.5	0.1
cat probability	catpr	1	0.6	0.4	3.3	0.06
fox probability	foxpr	1	14.1	0.0002	4.6	0.03
dingo probability	dingopr	1	22.1	0.000001	17.0	0.00004
predator richness	predvar	1	2.0	0.1	3.8	0.05
predator+herbivore richness	predherbvar	1	0.8	0.4	3.5	0.06
Fire						
fire map 3 category (rec,int,old)	fm3(r,i,o)	2	3.9	0.1	3.7	0.1
fire map 2 category (rec,int+old)	fm2(r,io)	1	3.6	0.06	3.4	0.06
fire: map years since	fmyrs	1	1.1	0.3	1.0	0.3
fire neighbourhood variety 1km r	fnbr1r	1	0.3	0.6	0.7	0.4
fire neighbourhood variety 2.5 km r	fnbr2.5r	1			0.3	0.5
fire neighbourhood variety 5 km r	fnbr5r	1	2.5	0.1	1.5	0.2
fire neighbourhood variety 10 km r	fnbr10r	1	1.5	0.2	0.1	0.7
fire neighbourhood variety 25 km r	fnbr25r	1	7.0	0.008	3.9	0.05
fire: distance to < 1yr old fire	fdist1yr	1	11.1	0.0008	7.9	0.005
fire: distance to 1–2 yr old fire	fdist2yr	1	0.9	0.3	0.4	0.5
fire: distance to < 2yr old fire	fdistrec	1	14.0	0.0002	7.9	0.005

Climate and vegetation

rainfall: cumulative in last 3 mths	r3mth	1	0.6	0.4	6.5	0.01
rainfall: cumulative in last 6 mths	r6mth	1	0.2	0.7	0.7	0.4
rainfall: cumulative in last 12 mths	r12mth	1	4.4	0.03	0.01	0.9
rainfall: cumulative in last 24 mths	r24mth	1	4.2	0.04	0.2	0.7
rainfall :residual from 12 mth mean	r12mdev	1	1.5	0.2	0.07	0.8
rainfall: residual from 24 mth mean	r24mdev	1	1.7	0.2	0.9	0.3
rainfall: cumulative since fire	rsincef	1	0.2	0.6	1.3	0.2
rainfall: annual mean	ryrmean	1	13.8	0.0002	15.5	0.00008
temperature (minimum)	tempmax	1	0.1	0.8	2.0	0.2
temperature (maximum)	tempmin	1	11.6	0.0007	4.2	0.04
vegetation: total cover	vegcov	1	0.8	0.3	4.7	0.03
spinifex: total cover	spincov	1	2.7	0.1	3.3	0.07
shrub: total cover	shrbcov	1	0.3	0.6	6.0	0.01
plant species richness	plntssp	1	0.4	0.5	0.1	0.7

Appendix 2. Generalised linear models indicating the strength of association between bilby sign and proposed introduced herbivore- and substrate-related parameters for the a) entire study area and b) the reduced (source) study area. See Appendix 1 for an explanation of variable abbreviations. Estimate values for categorical variables are identified in italics. Calculation of

1. Introduced herbivore and substrate

a) entire study area

Total Deviance = 167.7, adjusted $D^2 = 0.159$, AIC= 147.6

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-3.989	0.732	206	<0.001
sm2(lr,dcs) <i>lr</i>	1.652	0.486	205	<0.001
sdist.dc	0.033	0.011	204	0.002
snbr2.5r	0.611	0.275	203	0.026

b) reduced study area

Total Deviance = 131.4, adjusted $D^2 = 0.137$, AIC=118.6

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-1.735	0.880	139	0.048
sm2(lr,dcs) <i>dcs</i>	-1.522	0.505	138	0.003
snbr2.5r	0.504	0.282	137	0.054

2. Predators

a) entire study area

Total Deviance = 167.7, $D^2 = 0.118$, AIC=147.2

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-1.438	0.343	206	<0.001
fox.pr	-11.026	3.392	205	<0.001
fox.pr × dingo.pr	47.591	14.370	204	<0.001

b) reduced study area

Total Deviance = 131.4, adjusted $D^2 = 0.164$, AIC=118.4

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-3.350	0.584	139	<0.001
dingo.pr	6.561	1.698	138	<0.001

3. Fire

a) entire study area

Total Deviance = 167.7, $D^2 = 0.066$, AIC=157.7

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-1.254	0.253	206	<0.001
fdist.1yr	-0.0344	0.0139	205	0.013

b) reduced study area

Total Deviance = 131.4, adjusted $D^2 = 0.102$, AIC=124.3

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-4.208	1.622	139	0.009
fa2(r,io) <i>r</i>	0.982	0.481	138	0.041
fdist.1yr	-0.056	0.0253	137	0.027
fnbr25r	0.493	0.258	136	0.056

4. Climatic, vegetation

a) entire study area

Total Deviance = 167.7, adjusted $D^2 = 0.182$, AIC=143.8

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	10.2513	6.108	206	0.093
ryrmean	0.0187	0.0044	205	<0.001
ryrmean ²	-11.940	5.214	204	0.022
tempmin	-0.731	0.347	203	0.035

b) reduced study area

Total Deviance = 131.4, $D^2 = 0.117$, AIC=112.0

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	11.315	2.976	139	<0.001
ryrmean	0.027	0.00798	138	<0.001

5. Global model derived with consideration of all variables

a) entire study area

Total Deviance = 167.7, adjusted $D^2 = 0.258$, AIC=135.2

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-4.222	0.594	206	<0.001
sm2(lr,dcs) <i>lr</i>	1.680	0.502	205	<0.001
sdist.dc	0.032	0.010	204	0.001
dingo.pr	6.507	1.666	203	<0.001

b) entire study area (static model)

Total Deviance = 167.7, adjusted $D^2 = 0.221$, AIC=139.1

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	5.426	5.359	206	<0.311
sm2(lr,dcs) <i>lr</i>	1.717	0.481	205	<0.001
ryrmean	0.016	0.004	204	<0.001
tempmin	-0.778	0.358	203	0.03

c) reduced study area

Total Deviance = 131.4, adjusted $D^2 = 0.24$, AIC=107.9

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-1.236	0.748	139	0.098
sm(lrf,dcs) <i>dcs</i>	-1.75	0.522	138	<0.001
dingo.pr	4.884	1.777	137	0.006
fdist1yr	-0.0393	0.0232	135	0.09

d) reduced study area (static model)

Total Deviance = 131.4, adjusted $D^2 = 0.198$, AIC=110.7

Variable	Estimate	Std. Error	DF	Pr(> z)
(Intercept)	-8.343	3.078	139	0.006
sm2(lr,dcs) <i>dcs</i>	-1.493	0.502	138	0.002
ryrmean	0.0215	0.0081	137	0.008