Appendix

Table A1. Number of nests found per groups monitored across study years. The drought sampling period is shown by red text, and months for which nest data were not collected are denoted with 'xx'. Nest searching effort varied across each sampling period and is scored accordingly as low, moderate, or high.

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014												
Active nests	3	xx	xx	xx	xx	0	1	1	0	2	xx	xx
Groups monitored	47	xx	xx	xx	xx	47	47	47	47	47	xx	xx
% Active nests	6.38	xx	xx	xx	xx	0.00	2.13	2.13	0.00	4.26	xx	xx
Search effort	Moderate	xx	xx	xx	xx	Moderate	Moderate	Moderate	Moderate	Moderate	xx	xx
2015												
Active nests	xx	xx	xx	xx	xx	xx	1	0	1	1	3	6
Groups Monitored	xx	xx	xx	xx	xx	xx	67	67	67	67	67	67
% Active nests	xx	xx	xx	xx	xx	xx	1.49	0.00	1.49	1.49	4.48	8.96
Search effort	xx	xx	xx	xx	xx	xx	High	High	High	High	High	High
2016												
Active nests	9	3	4	xx	xx	xx	xx	xx	xx	xx	2	xx
Groups Monitored	64	64	64	xx	xx	xx	xx	xx	xx	xx	64	xx
% Active nests	14.06	4.69	6.25	xx	xx	xx	xx	xx	xx	xx	3.13	xx
Search effort	High	High	High	xx	xx	xx	xx	xx	xx	xx	Low	xx
2017												
Active nests	xx	xx	xx	xx	5	xx	xx	xx	xx	xx	xx	xx
Groups Monitored	xx	xx	xx	xx	31	xx	xx	xx	xx	xx	xx	xx
% Active nests	xx	xx	xx	xx	16.13	xx	xx	xx	xx	xx	xx	xx
Search effort	xx	xx	xx	xx	High	xx	xx	xx	xx	xx	xx	xx

Table A2. Full terms for initial models pooling drought and non-drought sampling periods: **(a)** male cloacal protuberance and **(b)** brood patch presence/absence in females, size-corrected body mass in **(c)** males and **(d)** females, body molt score in **(e)** males and **(f)** females, and log-transformed androgens in **(g)** males and **(h)** females. Bolded terms reflect significant comparisons and italics show terms removed from model ($P > 0.2$). Measurements that differed across drought vs. no drought sample periods were run in a sliding window model (Table 1). When photoperiod was a significant predictor, a separate model was run with data from drought period excluded (Table 2).

(a) Cloacal protuberance (N = 317 captures, 116 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	34.40	15.49				Male ID	21.62
Drought (Y)	**-12.78**	**5.82**	**1**	**4.82**	**0.03**		
Day length	**-12.78**	**5.82**	**1**	**5.91**	**0.02**		
Daylight trend (inc)	*-1.77*	*13.96*	*1*	*0.02*	*0.90*		
Day length x daylight trend	*-6.95*	*14.77*	*1*	*0.22*	*0.64*		

(b) Brood patch (N = 230 captures, 109 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	0.48	0.32				Female ID	0.86
Drought (Y)	-0.77	0.46	1	2.75	0.10		
Day length	**-0.83**	**0.37**	**1**	**4.98**	**0.03**		
Daylight trend (inc)	**0.94**	**0.34**	**1**	**7.45**	**0.006**		
Day length x daylight trend	-0.59	0.37	1	2.53	0.11		

(c) Male mass/tarsus residuals (N = 277 captures, 113 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	0.23	0.07				Male ID	0.45
Drought (Y)	0.13	0.07	1	3.40	0.07		
Day length	**-0.05**	**0.07**	**1**	**24.18**	**<0.001**		
Daylight trend (inc)	-0.26	0.05	1	0.44	0.51		
Day length x daylight trend	**0.29**	**0.06**	**1**	**23.37**	**<0.001**		

(d) Female mass/tarsus residuals (N = 215 captures, 112 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	8.59	0.07				Female ID	0.37
Drought (Y)	0.02	0.08	1	0.06	0.81		
Day length	**-0.23**	**0.11**	**1**	**4.45**	**0.03**		
Daylight trend (inc)	-3.42	1.84	1	3.45	0.06		
Day length x daylight trend	0.28	0.15	1	3.39	0.07		

(e) Male body molt score (N = 307 captures, 114 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	6.26	0.25				Male ID	0.83
Drought (Y)	**-1.16**	**0.34**	**1**	**11.57**	**<0.001**		
Day length	-0.4	0.24	1	2.84	0.09		
Daylight trend (inc)	**-0.88**	**0.30**	**1**	**8.37**	**0.004**		
Day length x daylight trend	0.45	0.28	1	2.65	0.10		

(f) Female body molt score (N = 279 captures, 124 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	5.32	0.28				Female ID	
Drought (Y)	*-0.32*	*0.46*	*1*	*0.50*	*0.48*		
Day length	0.03	0.27	1	0.01	0.91		
Daylight trend (inc)	**-1.31**	**0.36**	**1**	**13.13**	**<0.001**		
Day length x daylight trend	-0.55	0.36	1	2.35	0.12		

(g) Male plasma androgens (N = 158 captures, 82 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	5.79	0.29				Male ID	0.23
Drought (Y)	*0.06*	*0.22*	*1*	*0.07*	*0.80*		
Day length	**0.36**	**0.08**	**1**	**21.87**	**<0.001**		
Daylight trend (inc)	0.27	0.17	1	2.51	0.11		
Day length x daylight trend	*-0.15*	*0.16*	*1*	*0.86*	*0.35*		
Time of day bled	**-0.71**	**0.16**	**1**	**19.11**	**<0.001**		
Net-to-bleed time (am)	0.07	0.04	1	3.16	0.08		

(h) Female plasma androgens (n = 152 captures, 94 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	5.08	0.14				Female ID	<0.001
Drought (Y)	0.29	0.20	1	2.14	0.14		
Day length	0.2	0.14	1	2.11	0.15		
Daylight trend (inc)	-0.10	0.16	1	0.42	0.52		
Day length x daylight trend	**-0.34**	**0.16**	**1**	**4.89**	**0.03**		
Time of day bled (am)	*0.02*	*0.04*	*1*	*0.23*	*0.63*		
Net-to-bleed time	*-0.15*	*0.15*	*1*	*0.98*	*0.32*		

Table A3. Model results for photoperiodic effects (day length, increasing vs. decreasing light) during pooled non-drought years. Cloacal protuberance presence/absence **(a)** in males and brood patch presence/absence in females **(b)** was used to assess breeding readiness. Mass was assessed in males **(c)** and females **(d)** as a proxy for condition. In addition we sought to determine if photoperiod affects body molt **(e,f)** and plasma androgens **(g,h)** in both sexes. Bolded terms depict significant comparisons and italics show terms removed from final model.

(a) Cloacal protuberance (N = 149 captures, 86 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	16.91	10.40				Male ID	70.14
Day length	0.65	10.84	1	0.004	1.0		

(b) Brood patch (N = 230 captures, 109 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	-0.16	0.29				Female ID	0.68
Day length	0.27	0.32	1	0.7	1.00		
Daylight trend (inc)	*-0.11*	*0.47*	*1*	*0.55*	*0.46*		
Day length x daylight trend	*-0.65*	*0.78*	*1*	*0.70*	*0.40*		

(c) Male mass/tarsus residuals (N = 128 captures, 85 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	0.17	0.10				Male ID	0.41
Day length	**-0.42**	**0.10**	**1**	**19.32**	**<0.001**		
Daylight trend (inc)	0.11	0.13	1	1.76	0.72		
Day length x daylight trend	**0.46**	**0.13**	**1**	**12.13**	**0.004**		

(d) Female mass/tarsus residuals (N = 104 captures, 74 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	-0.39	0.06				Female ID	0.25
Day length	*-0.20*	*0.08*	*1*	*0.21*	*0.64*		
Daylight trend (inc)	-0.05	0.11	1	0.22	1.0		
Day length x daylight trend	*0.13*	*0.11*	*1*	*1.34*	*0.25*		

(e) Male body molt score (N = 149 captures, 86 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	6.68	0.32				Male ID	1.28
Day length	*0.03*	*0.43*	*1*	*0.004*	*0.95*		
Daylight trend (inc)	**-1.69**	**0.47**	**1**	**13.04**	**0.003**		
Day length x daylight trend	*-0.24*	*0.58*	*1*	*0.16*	*0.68*		

(f) Female body molt score (N = 143 captures, 86 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	6.25	0.42				Female ID	2.00
Day length	**1.25**	**0.41**	**1**	**9.15**	**0.02**		
Daylight trend (inc)	**-2.56**	**0.60**	**1**	**18.46**	**<0.001**		
Day length x daylight trend	**-1.66**	**0.61**	**1**	**7.39**	**0.04**		

(g) Male plasma androgens (N = 72 captures, 55 males)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	5.96	0.20				Male ID	0.28
Day length	*0.1*	*0.18*	*1*	*0.31*	*0.58*		
Daylight trend (inc)	0.54	0.22	1	6.27	0.06		
Time of day bled (am)	**-0.88**	**0.22**	**1**	**15.80**	**0.001**		
Net-to-bleed time	*0.02*	*0.05*	*1*	*0.18*	*0.67*		

(h) Female plasma androgens (n = 68 captures, 57 females)

Predictor	β	SE	DF	X^2	P	Random effects	σ
Intercept	2.69	0.60				Female ID	0.36
Day length	**-2.53**	**0.69**	**1**	**13.57**	**0.002**		
Daylight trend (inc)	**2.29**	**0.61**	**1**	**14.37**	**0.003**		
Day length x daylight trend	**2.02**	**0.70**	**1**	**8.46**	**0.03**		

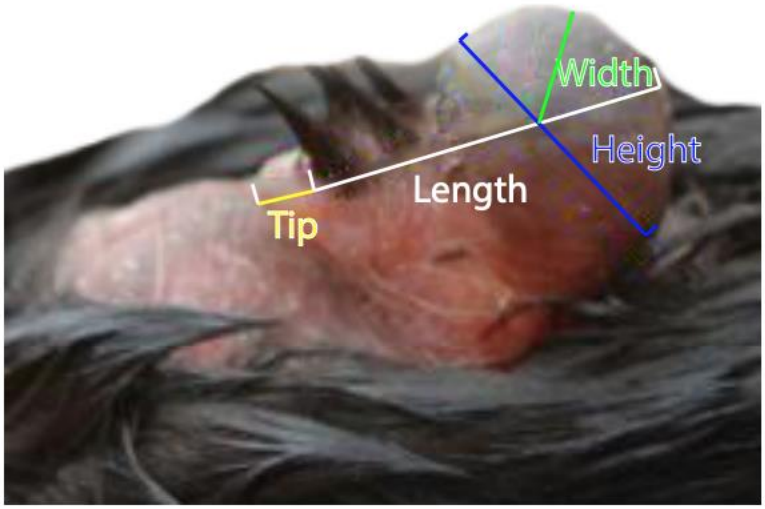

Figure A1. Bulbous cloacal protuberance of a male White-shouldered Fairywren. Each measurement used to calculate total volume is shown.

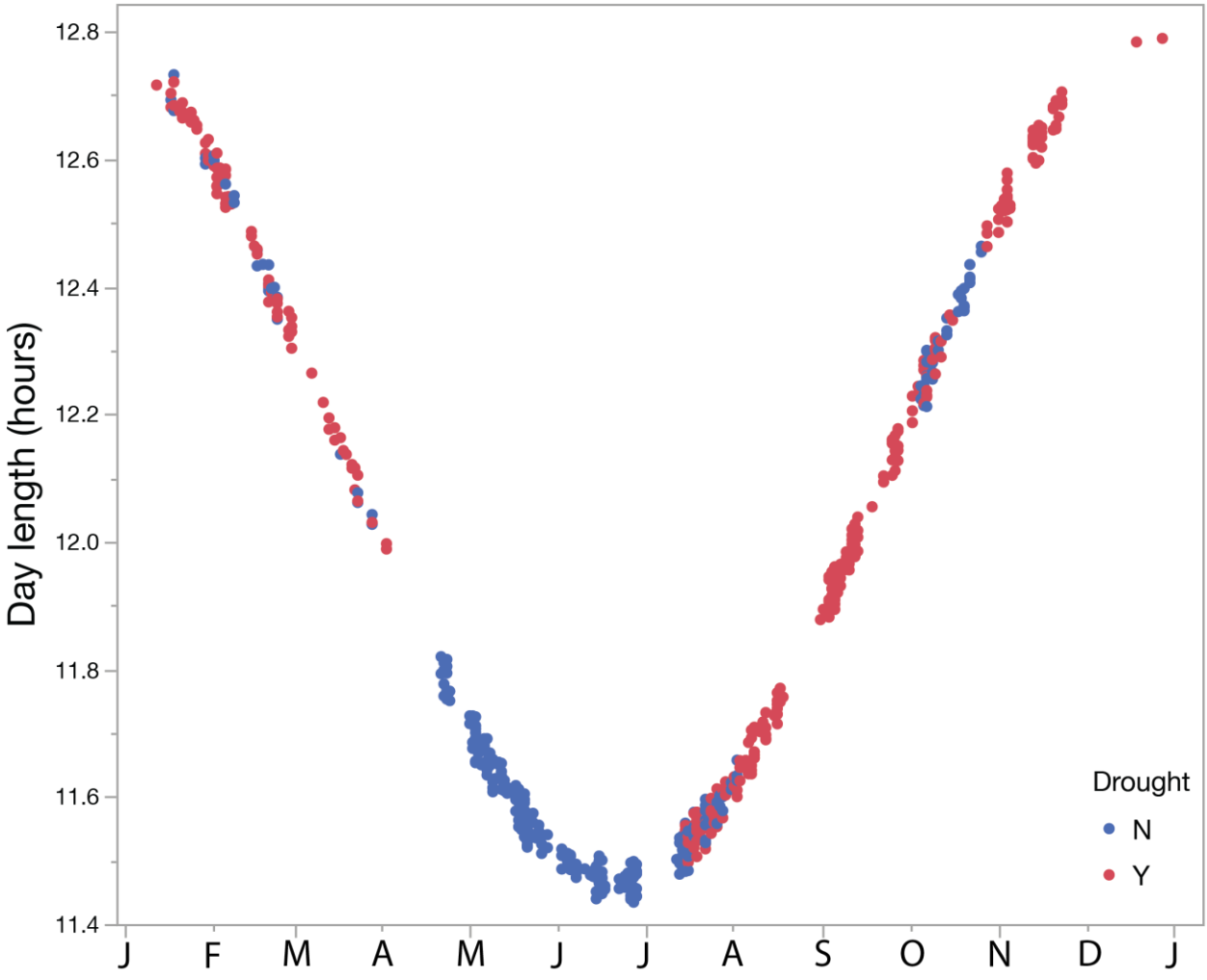

Figure A2. Day lengths across the year at our study site. Points indicate individual captures. The drought sampling period is depicted in red and the pooled non-drought sampling periods in blue.

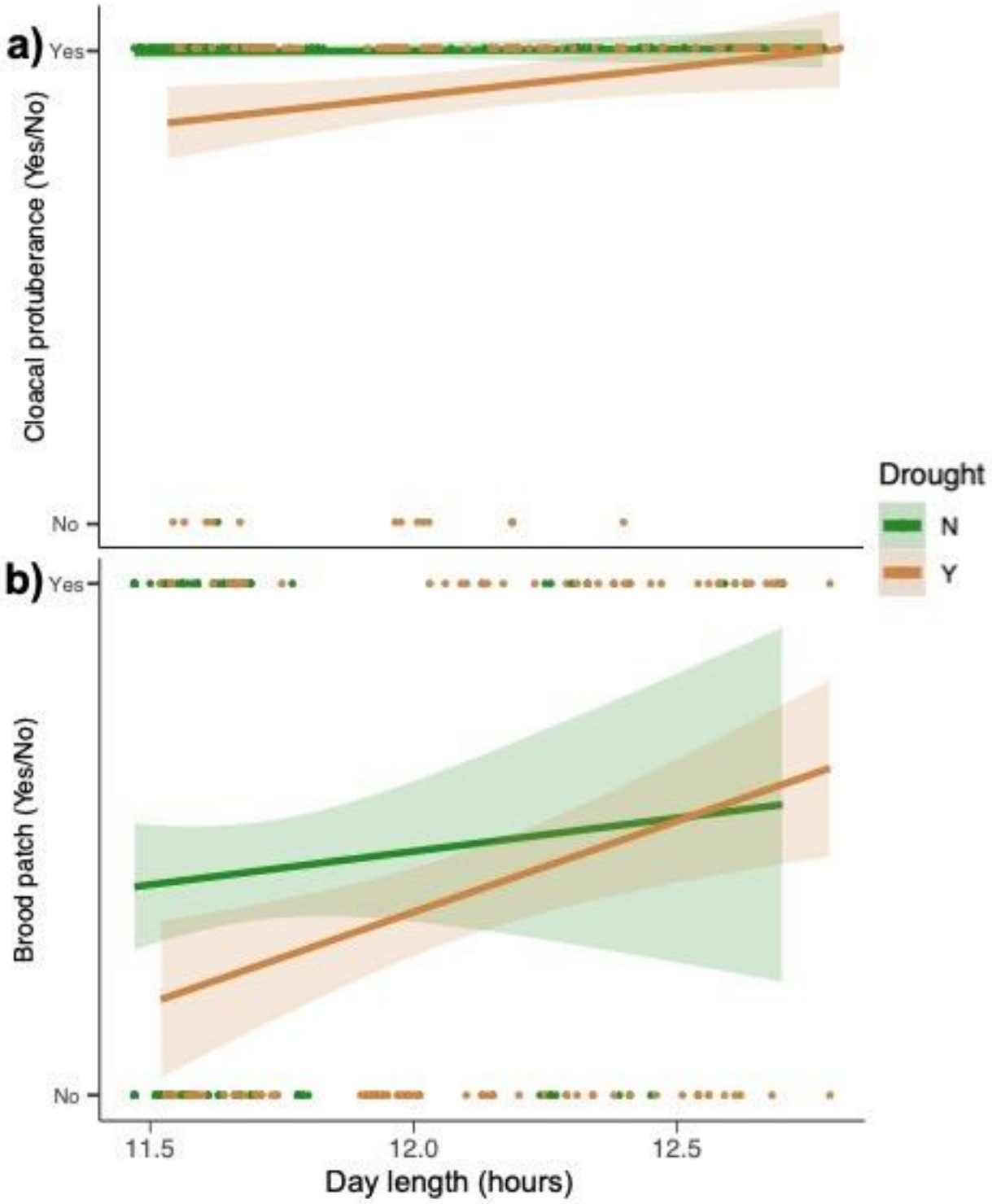

Figure A3. Breeding readiness by day length across drought (brown points and linear fit) and non-drought (green points and linear fit) sampling periods for **a)** male cloacal protuberance presence/absence and **b)** brood patch presence/absence in females.

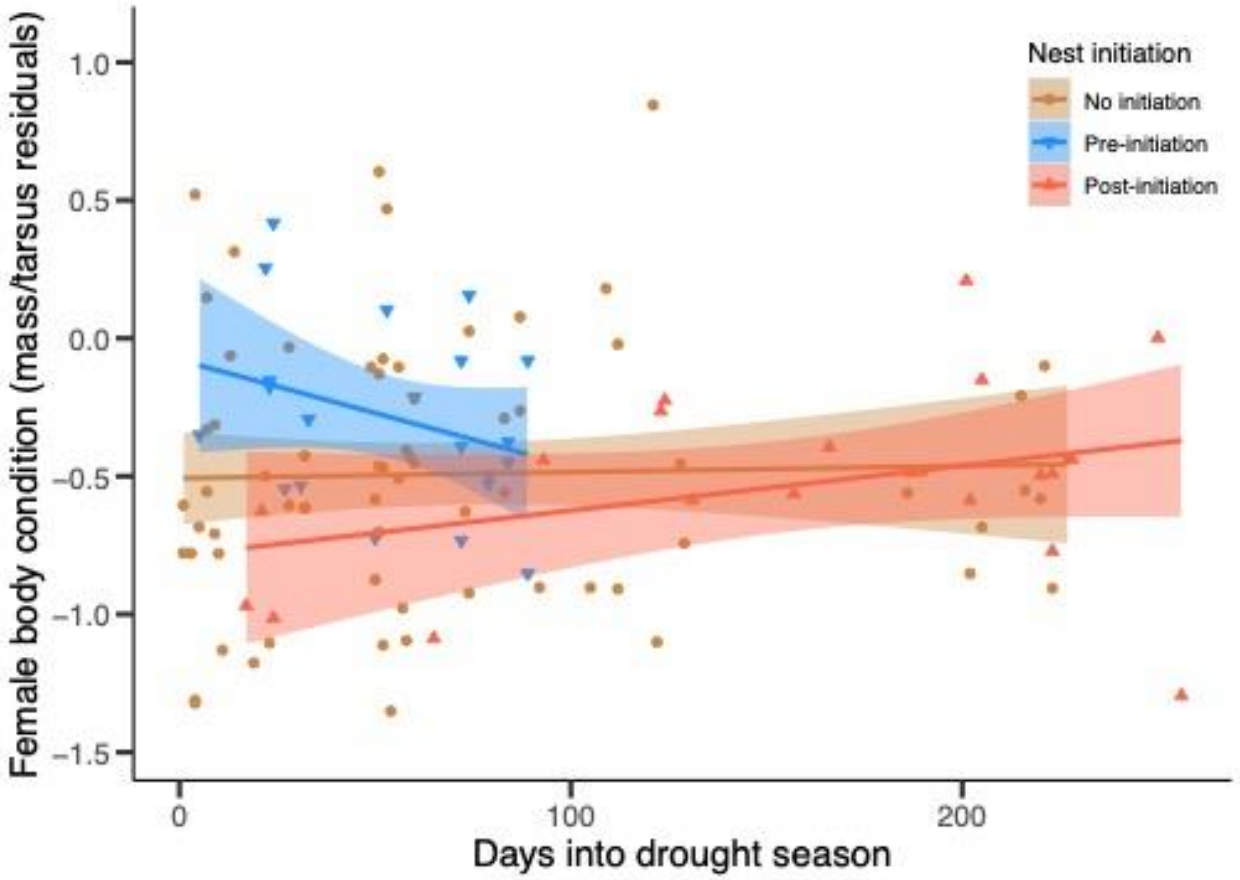

Figure A4. Relationship between days into the drought field season and female size-corrected body mass. Females who did not initiate a nest during drought are shown in brown circles, while pre-initiation nesting females are shown in blue upside-down triangles and post-initiation nesting females in red triangles. Females who did not nest had marginally lower size-corrected mass than nesting females captured before clutch initiation ($P = 0.05$). Among nesters, females had higher mass during pre-initiation relative to post-initiation females ($P = 0.004$), and we detected a non-significant interaction effect between nest initiation status and days into drought season ($P = 0.06$).

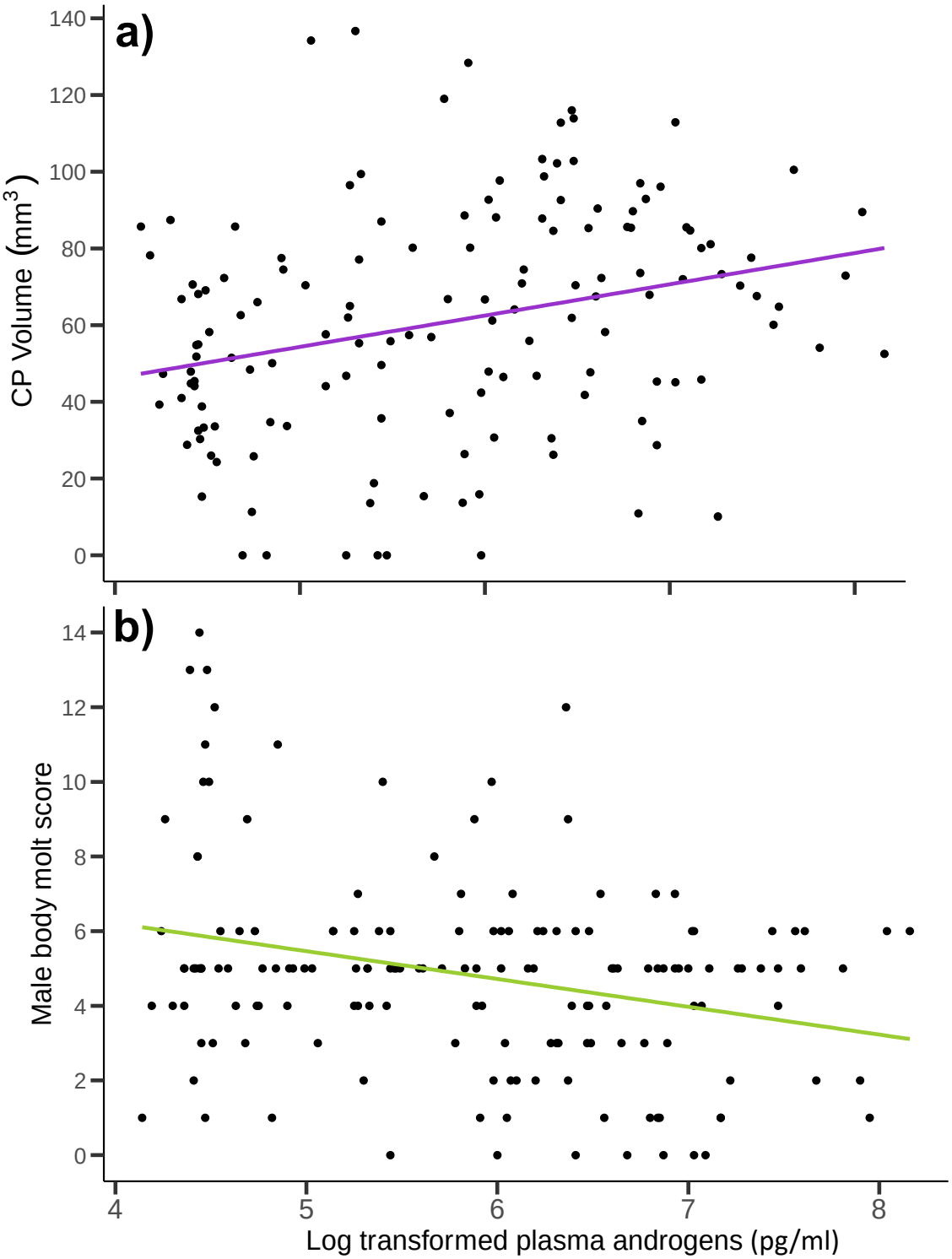

Figure A5. Relationship between log transformed plasma androgens with **a)** cloacal protuberance (CP) volume ($p < 0.001$) and **b)** male body molt score ($p < 0.001$).