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Supplementary material for

Factors affecting nestling condition and timing of egg-laying in the endangered Carnaby's cockatoo *Calyptorhynchus latirostris*

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Relationship length of folded left wing as a function of nestling age, Period, and Sex

The primary objective of the comparison of the data from the Coomallo Creek population was to establish that the relationships between length of folded left wing (FLW) and age, and body mass and age had not changed between the periods 1970 -1976 and 2009-2017, and was not a function of the sex of the nestlings.

Table S1. Ranking of models describing the relationship between length of folded left wing with nestling age, period and sex as predictors.

Model	dAIC	df	Weight
cAge + I(cAge^2) + I(cAge^3) + Period + Sex	0.0	9	0.7859
cAge + I(cAge^2) + I(cAge^3) + Sex	2.7	8	0.2074
cAge + I(cAge^2) + I(cAge^3) + Period	10.0	7	0.0053
cAge + I(cAge^2) + Sex	12.6	6	0.0014
cAge + I(cAge^2) + I(cAge^3)	67.6	7	<0.001
cAge + I(cAge^2) + Period	73.3	6	<0.001
cAge + I(cAge^2)	76.7	5	<0.001
cAge	100.6	4	<0.001

Coefficients of the 'best' model based on Table S1.

Parameter	Estimate	Std. Error	2.50%	97.50%
(Intercept)	218.8093	4.449619	210.3215	227.3058
cAge	6.099465	0.084813	5.931223	6.261966
I(cAge^2)	-0.03007	0.0025	-0.03487	-0.02513
I(cAge^3)	-0.00153	0.000132	-0.00178	-0.00127
PeriodLate	1.093842	3.975535	-6.48872	8.675951
SexF	-10.825	5.250447	-20.8475	-0.80622

Note that the 95% confidence interval for both the Period and Sex parameters include zero.

Table S2. Ranking of models describing the relationship between nestling body mass with nestling age, period and sex as predictors.

Model	dAIC	df	Weight
cAge + I(cAge^2) + Sex	0	7	0.9677
cAge + I(cAge^2) + Period	7.5	6	0.0222
cAge + I(cAge^2) + I(cAge^3) + Period + Sex	9.7	9	0.0078
cAge + I(cAge^2)	12.6	5	0.0017
cAge + I(cAge^2) + I(cAge^3) + Sex	14.9	8	<0.001
cAge + I(cAge^2) + I(cAge^3) + Period	22.4	7	<0.001
cAge + I(cAge^2) + I(cAge^3)	27.5	6	<0.001
cAge	181.5	4	<0.001

Coefficients of the 'best' model based on Table S2.

Parameter	Estimate	Std. Error	2.50%	97.50%
(Intercept)	609.021	15.0428	580.0649	638.115
cAge	4.3243	0.1985	3.9293	4.70782
I(cAge^2)	-0.2655	0.0121	-0.28891	-0.24146
SexF	22.3338	17.5577	-11.7475	56.1118

Note that the 95% confidence interval for the parameter for the difference between the sexes includes zero.

Ranking of the models fitted to the data from the Coomallo Creek population

A sequence of linear mixed models were fitted, and ranked using the information theoretic approach following the methods implemented by Bolker (R package 'bblme') following Burnham and Anderson (2002). The response variable is nestling body mass (log transformed), the predictors are the population (Site), the length of the folded left wing (FLW), and the length of time into the laying season (Layingseason). All models had a random intercept for nestling identity and year of the breeding season.

Table S3. The weights of the competitive models fitted to log transformed body mass as a function of population (Site), observed length of folded left wing (FLW) and days that the eggs were laid into the current breeding season. All models had two random effects, the identity of the nestling, and the year of the breeding season.

Model	dAIC	df	Weight
Site + poly(FLW, 2) + Layingseason	0.0	16	1
Site + poly(FLW, 2)	106.5	15	<0.001
Site * poly(FLW, 2)	339.1	32	<0.001
poly(FLW, 2)	410.3	6	<0.001

References

Bolker, B. R. and Development Core Team, 2017. bbmle: Tools for General Maximum Likelihood Estimation. R package version 1.0.20. https://CRAN.R-project.org/package=bbmle

Burnham, K. P. and Anderson, D. R., 2002. Model selection and multimodel inference : a practical information-theoretic approach. Springer, New York.