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Appendix 1

Results from models testing the effects of natal *cohort quality* (the overall annual average number of fledglings produced per brood, Fig. 1) and natal *within-cohort nest quality* (the deviation in the number of fledglings produced in each brood from the overall annual cohort average) on 1) local *prospecting probability*, the probability of a fledgling to be observed in the population during adulthood, 2) local *recruitment probability*, the probability of a prospector to attempt reproduction in the colony, as defined by it reaching the incubation stage at least once, 3) *age at first prospecting and recruitment*, and, for birds that recruited, 4) *lifespan*, with birds being assumed to have died when they have not been recorded in the colony for at least two seasons (also see Bouwhuis et al. 2015, Zhang et al. 2015), and 5) *lifetime reproductive success (LRS)*, assessed as the total number of fledglings produced. The effects of cohort and nest quality are tested using mixed-effect models run in MLwiN (ver. 2.26, Rasbash et al. 2005) with binomial (1 and 2) and Poisson (3–5) distributed errors and a Markov chain Monte Carlo estimation algorithm with 100 000 iterations. In addition to the effects of cohort and nest quality, models include linear covariates of *year of birth* and *population size* (estimated as the number of breeding pairs) to account for the fact that fledglings from more recent years have had fewer years to produce a successful life history (also see Bouwhuis et al. 2015) and that fledglings from larger cohorts may suffer from reduced survival (Fay et al. 2017), respectively. Reported are parameter estimates with standard errors as obtained in the full models, for which the significance (two-tailed) of fixed effects is assessed using the Wald statistic, which approximates the chi² distribution. Note that, in order to pinpoint at which life stage potential selection occurs, our analytical approach is sequential: each life stage is analysed only for individuals that survived to the previous life stage and sample sizes are presented for each of the traits.

Trait	Parameter	Est ± SE	χ^2	p
prospecting probability	year of birth	0.035 +/- 0.047	0.543	0.461
(binomial)	population size	-0.003 +/- 0.002	1.872	0.171
n = 3896	cohort quality	0.642 +/- 0.263	5.982	**0.014**

	nest quality	-0.091 +/- 0.059	2.386	0.122
age at first prospecting	year of birth	-0.005 +/- 0.009	0.289	0.591
(Poisson)	population size	0.000 +/- 0.000	0.004	0.950
n = 1482	cohort quality	-0.035 +/- 0.054	0.425	0.514
	nest quality	-0.026 +/- 0.028	0.891	0.345
recruitment probability	year of birth	0.008 +/- 0.039	0.040	0.841
(binomial)	population size	-0.002 +/- 0.002	1.800	0.180
n = 1482	cohort quality	0.136 +/- 0.265	0.264	0.607
	nest quality	0.114 +/- 0.091	1.566	0.211
age at recruitment	year of birth	-0.013 +/- 0.011	1.521	0.217
(Poisson)	population size	0.001 +/- 0.000	1.828	0.176
n = 959	cohort quality	-0.067 +/- 0.069	0.945	0.331
	nest quality	-0.002 +/- 0.027	0.007	0.933
lifespan	year of birth	-0.084 +/- 0.017	25.449	<0.001
(Poisson)	population size	0.001 +/- 0.001	2.576	0.109
n = 526	cohort quality	0.059 +/- 0.062	0.905	0.341
	nest quality	0.018 +/- 0.028	0.412	0.521
LRS	year of birth	-0.162 +/- 0.047	12.002	<0.001
(Poisson)	population size	0.000 +/- 0.002	0.037	0.847
n = 526	cohort quality	-0.097 +/- 0.163	0.356	0.551
	nest quality	0.118 +/- 0.074	2.548	0.110

References

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