Supplementary material

Are any populations 'safe'? Unexpected reproductive decline in a population of Tasmanian devils free of devil facial tumour disease

K. A. Farquharson[A,*], *R. M. Gooley*[A,*], *S. Fox*[B], *S. J. Huxtable*[B], *K. Belov*[A], *D. Pemberton*[B], *C. J. Hogg*[A,†] *and C. E. Grueber*[A,C,D,†]

[A]The University of Sydney, School of Life and Environmental Sciences, Faculty of Science, Sydney,

NSW, 2006, Australia.

[B]Save the Tasmanian Devil Program, Department of Primary Industries, Parks, Water and

Environment, Hobart, Tasmania, 7001, Australia.

[C]San Diego Zoo Global, San Diego CA, USA.

[D]Corresponding author. Email: catherine.grueber@sydney.edu.au

* jointly contributed to this work

† jointly supervised this work

Table S1 Pouch status characterisation in female Tasmanian devils (*Sarcophilus harrisii*), summarised from Hesterman *et al.* (2008).

Pouch appearance	Explanation	Breeding status*
immature, pale/small	sexually immature	NA
pinkish, dry	coming into ovulation (too early to determine breeding status)	NA
some oil, red	coming into ovulation (too early to determine breeding status)	NA
max, puffy, lipstick ring, oil drops	coming into ovulation (too early to determine breeding status)	NA
postovulatory, deep/wet - no milk studs	ovulated, failed to breed	NB
postovulatory, deep/wet, milk studs present	ovulated, failed to breed	NB
pouch young	pouch young present	B
lactating (pouch dropped in den), swollen pouch, broad teats	lactating (evidence of offspring)	B
regressing, flaccid, lumpy pouch	weaned young	B
regressed, tiny teats, hard, taut pouch	failed to breed during year of monitoring	NB
lost pouch young, long (2cm) thin teats	breeder, pouch young failed to survive	B
post-reproductive, brown oil, old animal	senescent individual	NA

*NA; not applicable: breeding status cannot be determined, NB; nonbreeder, B; breeder
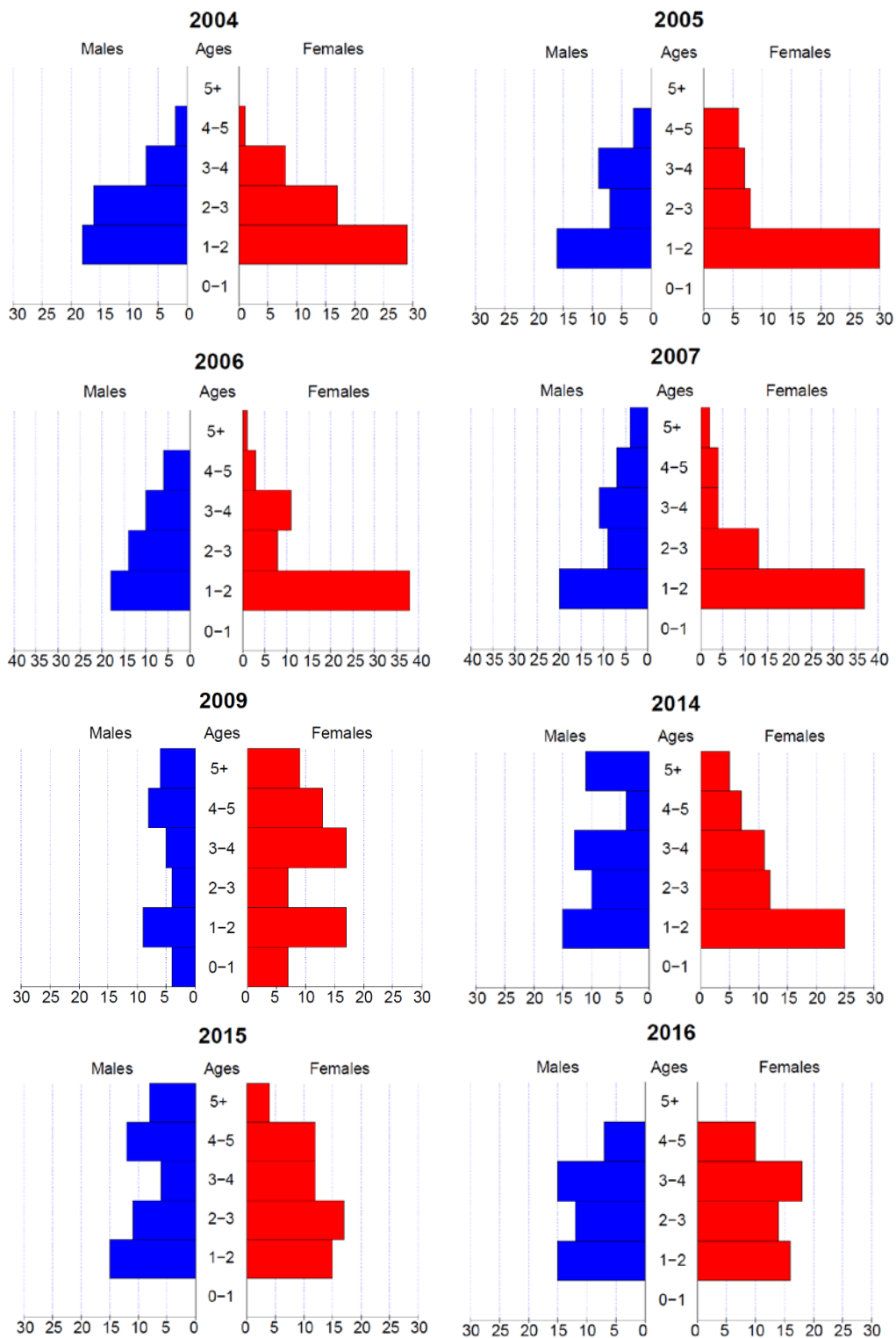
Supplementary Fig. S1: Age pyramids for the 8 years of trapping, with age categories on the central y-axis and frequency for males (left-hand side, blue) and females (right-hand side, red) on x-axes.
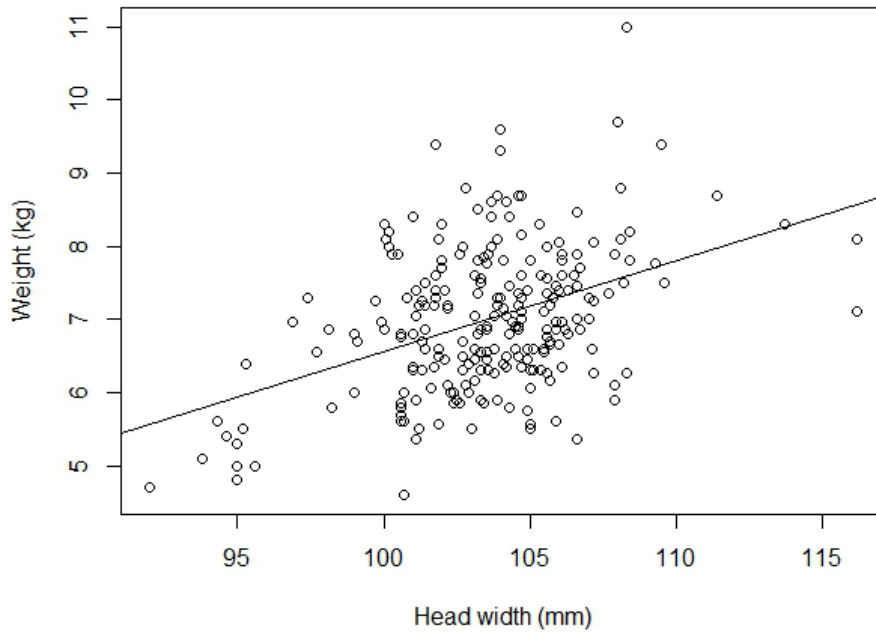
Supplementary Fig. S2: Variation in body weight for head widths of females in analysis for which these were recorded (N = 239). Solid line is linear regression of weight on head width (intercept = -5.87 ± 1.80 SE; head width effect size = 0.12 ± 0.017 SE; $p < 0.001$; adjusted R^2 = 0.177).
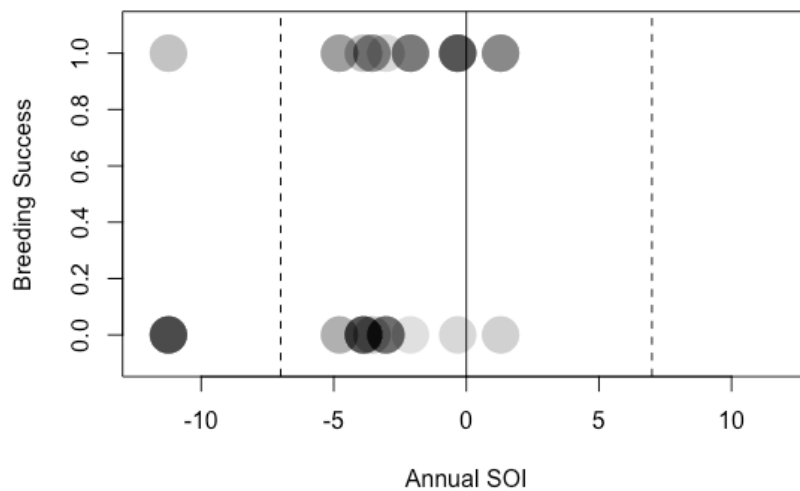
Supplementary Fig. S3: Annual breeding success of females in analysis for which reproductive status could be determined (N = 240; points show individual observations, with darker points indicating multiple overlaid values) as a function of annual Southern Oscillation Index (SOI). Sustained periods above +7 indicate a La Niña event, while sustained periods below -7 indicate an El Niño event, shown by vertical dashed lines (at ± 7). SOI data obtained from Bureau of Meteorology 2017.