Ecography

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Cunningham, C. X., Scoler, V., Johnson, C. N., Barmuta, L. A. and Jones, M. E. 2019. Temporal partitioning of activity: rising and falling top-predator abundance triggers community-wide shifts in diel activity. – Ecography doi: 10.1111/ecog.04485

Supplementary material

Table A1: Details of camera trapping method. In each of the four separate camera trapping studies, RECONNYX PC-600/PC-800 remote-cameras were fastened to a tree ~75 cm above the ground. Cameras were baited with an olfactory and visual lure suspended from a tree 2-3 m in front of the camera. The lure consisted of a perforated PVC canister containing dried beef liver, tuna oil, peanut butter, rolled oats and sardines, with a CD suspended below as a visual. In the three space-for-time studies, to ensure sites of the same habitat type were environmentally comparable, we held sites within similar average annual rainfall (dry: 750-1500 mm, wet: 1100-2000 mm; coastal: 650-1200; Bureau of Meteorology GIS layer) and elevation (dry < 500 m, wet <800 m, coastal < 100 m) ranges, and all sites occurred in the northern half of Tasmania to avoid the north-south temperature gradient.

Description	Study details
Space-for-time survey at 29 study sites.	We used 14 cameras at 29 study sites, totalling 406 cameras. We detected 16,230 independent animal records from a total of 20,048 camera nights. The 14 cameras at each site were deployed at approximately equal intervals (between 100-200 m apart) along a 2-km transect that ran parallel to an unsealed, rarely used road. Cameras were deployed >40 m into the forest for a minimum of 35 nights. Sites were in three habitat types: wet Eucalypt/rainforest, dry Eucalypt, and coastal vegetation (TasVeg GIS layer). Sites spanned the gradient of devil declines with approximately equal representation of habitat types in each disease region.
Space-for-time survey at 45 study sites.	We used 4 cameras at 45 study sites, totalling 180 cameras. We detected 8,049 independent animal records from a total of 8,704 camera nights. Cameras were deployed at 500 m intervals along a 2-km transect that ran parallel to an unsealed, rarely used road. Cameras were deployed >40 m into the forest for a minimum of 28 nights. Sites were in three habitat types: wet Eucalypt/rainforest, dry Eucalypt, and coastal vegetation (TasVeg GIS layer). Sites spanned the gradient of devil declines with approximately equal representation of habitat types in each disease region.
Space-for-time survey at 13 study sites	We used 20-21 cameras at 13 study sites, totalling 270 cameras. We detected 5,203 independent animal records from a total of 7,080 camera nights. Cameras were deployed in an approximate grid and spaced about 1 km apart. Cameras were deployed >40m into the forest from an unsealed, rarely used road or hiking track for a minimum of 21 nights. Sites were in two habitat types: wet

	Eucalypt/rainforest, and a composite of dry Eucalypt and coastal habitat (TasVeg GIS layer). Sites spanned the gradient of devil declines with approximately equal representation of habitat types in each disease region.
Longitudinal survey at two study sites	We surveyed Maria Island, a 116 km^2 National Park located 4 km off Tasmania's east coast, and a control site from 2013-2017. Most mammal species common to mainland Tasmania are present on Maria Island, including the major prey species for devils: Tasmanian pademelon, Bennett's wallaby and the common wombat. Cats were probably introduced to Maria Island shortly after European settlement in 1825. The climate on Maria Island and the control site is representative of much of east coast Tasmania (average annual rainfall of Maria Island = 662-837 mm and the control site = 672-865 mm), and is dominated by dry Eucalypt forest, with some wet Eucalypt forest. Camera trapping occurred at 53-72 locations on Maria Island and 50 at the control, totalling 735 cameras. We detected 42,184 independent animal records from a total of 40,684 camera nights. Camera locations were selected so there was similar representation of wet Eucalypt and dry Eucalypt habitat types between Maria Island and the control site. We surveyed camera locations in summer and winter each year on Maria Island, and in winter at the control site (excluding 2015 due to logistical constraints). Cameras were deployed in the forest for at least 21 nights.

Table A2: Results of models predicting devil abundance indices. For the space-for-time study (a), we predicted an index of devil abundance (devil detections per camera night) using a generalised additive mixed-effects model (GAMM). We used the approximate p-value to guide whether a smooth or parametric term should remain in the model at $\alpha = 0.05$. For the longitudinal study (b), we predicted devil detections using a generalised linear model (GLM), which we ranked based on change in AICc (ΔAICc) and model weights (w_i). We present models within 10 ΔAICc of the top model. Model coefficient estimates are shown for each predictor variable with standard errors in parentheses. All GLMs contained an offset for camera nights, because this varied slightly due to camera malfunctions.

a) Space-for-time study: Generalised additive mixed-effects model

Model terms	**Estimated df**	**p-value**	**Coefficient estimate (SE)**
Smooth terms			
Years diseased	1.801	< 0.0001	
Site (random effect)	10.616	0.054	
Parametric terms			
Intercept		<0.0001	-2.4393 (0.2013)
HabitatDry		0.154	-0.4716 (0.3273)
HabitatWet		0.04	-0.5773 (0.2765)

b) Longitudinal study: Generalised linear model

	(Intercept)	**Location**	**Season**	**Year**	**Location*Year**	**offset**	**df**	**AICc**	**ΔAICc**	w_i
1	-561.2 (178.89)	Maria: -536.65 (182.84)	Winter: 0.42 (0.05)	0.28 (0.09)	Year*Maria: 0.27 (0.09)	+	5	307.6	0.00	0.77
2	-1080.0 (369.6)	Maria: -2.58 (0.13)	Winter: 0.42 (0.05)	0.53 (0.02)		+	4	310.0	2.42	0.23
null	-2.01					+	1	1964.09	1964.09	0.00