

Supplementary Material

Repeatable measure of cage trap behaviour to quantify boldness and agitation in a macropod

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Cage trap behaviour protocol for woylies.

This protocol is designed to measure the activity levels of woylies during the capture and handling process. Please rate the level of activity of the animal as zero, low, medium or high (using the descriptions below) at each of the following points while processing.

Category	Description	Scoring definitions
Approach	When the handler is approaching the cage trap (from 10m away to the point at which you arrive at the trap).	0: The animal did not move in the trap. L: The animal remained still for most of the time, with only a few movements back and forth or up/down. M: The animal was moderately active in the trap, with regular but not constant movements back and forth and up/down. H: The animal was very active in the trap, constantly moving back and forth and up/down
Bag on trap	When the handler places and positions the capture bag over the end of the cage trap.	0: The animal did not move when the bag was placed over the trap. L: The animal remained still for most of the time as the bag was placed over the trap, with only a few movements back and forth or up/down. M: The animal was moderately active in the trap as the bag was placed over the trap, with regular but not constant movements back and forth and up/down. H: The animal was very active in the trap as the bag was placed, constantly moving back and forth and up/down
Door open	When the handler opens the door – i.e. does the animal immediately move into the bag.	0: The animal did not move when the door was opened (and had to be coaxed from the back of the trap) L: The animal remained still briefly, and then moved into the bag on their own. M: The animal moved calmly but quickly into the bag H: The animal was moving erratically either back and forward in the trap (requiring coaxing) or moving erratically into the bag
Bag before handling	When the animal is secured in the capture bag before it is handled/processed (i.e. during weighing).	0: The animal did not move in the bag L: The animal remained still for most of the time in the bag, with only a few kicks/movements M: The animal was still for part of the time in the bag, but moved/kicked repeatedly for more than 10 seconds H: The animal was highly active in the bag, kicking/moving most of the time or constantly
Bag during handling	When the animal is secured in the capture bag while it is being handled/processed (i.e. while body condition and sex are being assessed).	0: The animal did not move in the bag L: The animal remained still for most of the time in the bag, with only a few kicks/movements M: The animal was still for part of the time in the bag, but moved/kicked repeatedly for more than 10 seconds H: The animal was highly active in the bag, kicking/moving most of the time or constantly
Vocalise	Did the animal vocalise (i.e. a squeak or grunt).	Y: Yes, the animal made a squeak or grunt N: No, the animal did not vocalise
Heavy breathing	Was the animal breathing heavily	Y: Yes, the animal could be heard making audible heavy breaths N: No heavy breathing could be heard
Trap damage wounds	Did the animal have any recent (in last 24h) wounds that would indicate trap damage.	Y: Yes, the animal had some form of wound that indicated damage from attempting to escape from the cage trap. N: No, the animal had no fresh wounds
Joey ejections	Did the animal eject their joey	Y: Yes, the animal ejected their joey (regardless of the outcome of the re-insertion). N: No, the animal did not eject their joey NA: The animal was male, or did not have a joey

Woylie cage trap behaviour

Supplementary file 2

Date: _____ Location/grid site: _____ Handling team: _____

Please record activity level (zero, low, medium or high) and Y/N to the following questions (and please see accompanying protocol for category/scoring definitions).

[illegible]

Supplementary file 3: Additional methods and results for mixed effects models.

Methods

All statistical analyses were conducted in R (R Core Team, 2020). We built three binomial mixed-effects models using the package glmmTMB (Brooks et al., 2017) for each of our response variables, presence of: trap damage, heavy breathing, or vocalisations. In each model, we made observer identity a random effect in all models to account for potential observer bias and different handling techniques. As the data contained recaptures, we also included animal identity as a random effect to account for the non-independence of multiple observations from the same individual. We checked for overdispersion and collinearity using performance package (Ldecke, Makowski, & Waggoner, 2019), considering overdispersion parameters below 1 not to be over-dispersed (McCullagh & Nelder, 1994), and variance inflation factors below 1.5 to be acceptably correlated (Zuur, 2011).

Results

Model	Model term	Slope	SE	p
Trap damage <i>n</i> =77	Cumulative_score	0.102	0.131	0.434
	Sex(Male)	-0.317	0.650	0.624
Heavy breathing <i>n</i> =77	Cumulative_score	0.461	0.189	0.015
	Sex(Male)	-0.216	0.696	0.757
Vocalisations <i>n</i> =77	Cumulative_score	0.257	0.110	0.019
	Sex(Male)	-0.283	0.555	0.611

References

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