MOUNT EMERALD WIND FARM – NORTHERN QUOLL MONITORING PROGRAM

SUMMARY OF RESULTS: FEBRUARY 2018

Monitoring Grid (refer to Map. 1)	No. survey points	Survey Occasion	No. individual quolls detected	Quoll population estimate (se)[1]	Quoll occupancy (se)[2]	Quoll detection probability (se)[3]
Mt Emerald Site 1	35	February 2018	21	45.5(11.4)	1(0.001)	0.0853(0.013)
Mt Emerald Site 2	36	February 2018	18	67.9(29.1)	Naïve occupancy 0.53*	0.05(0.01)
Davies Ck Site, Davies Ck NP	36	February 2018	20	38.7(10.8)	0.6396(0.1231)	0.1047(0.0231)
Tinaroo Ck Site, Dinden NP	NA	February 2018	NA	NA	NA	NA
Upper Walsh River Site	36	February 2018	1	Insufficient spatial recapture data	Naïve occupancy 0.06*	Insufficient detections for modelling
Brooklyn Sanctuary[4]	36	February 2018	14	Insufficient spatial recapture data	0.3839(0.1248)	0.0781(0.026)
TOTAL	179		74			

Table 1. Three metrics of quoll abundance and detection probability values for six quoll monitoring sites monitored during February 2018.

NOTES

[1]population estimated using spatially explicit capture-recapture modelling (Efford 2016); [2] Occupancy is the proportion of sites (in this case the 36 trail camera monitoring points within each monitoring grid), at which quolls are estimated to occur, given the modelled uncertainty in detecting quolls when they occur at a point. Modelled using Presence software (Hines 2006); [3] Detection probability is the modelled probability of detecting a quoll on each detection opportunity when it is present at a site. Modelled using Presence software (Hines 2006); [4] The Brooklyn site replaced the Biboorah site from July 2017 onwards; * Naïve occupancy used in this case as insufficient detections were made.

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Trail cameras were used to collect capture-recapture and site occupancy data on five populations of northern quoll *Dasyurus hallucatus* (Map 1) during February 2018. Access to one site "Tinaroo" was denied due to changes to Queensland government permitting which provides for veto of permit applications by Native Title holders. We therefore only surveyed five of the six sites intended for long-term monitoring.

Seventy-four individual quolls were detected (Table 1) during approximately 3000 camera trap days. Population estimates were able to be generated at three of the sites due to low numbers of spatial recaptures from two of sites. Occupancy estimates were able to be generated at three of the five sites (Table 1), also due to the low numbers of captures.

Figure 1 - Indicative locations of the six monitoring grids (red diamonds) used to monitor Northern Quoll populations in the northern Atherton Tablelands from July 2017 onwards. Monitoring site names in white text. Local place names in black text. Note that Site Tinaroo was not utilised during February 2018 due to permits being denied for this area. Basemap: GoogleEarth Pro 9 December 2017.

The number of quoll individuals detected on each of our 3km^2 sites ranged from 1 to 21 (Appendix A). The numbers from the Mt Emerald sites are at the higher end of this range (Table 1). Of the three sites for which population sized could be estimated, the Davies Creek site had the lowest population size. The occupancy of the Mt Emerald sites was within the range of values, but at the higher end of those value at the two control sites (Table 1).

APPENDIX A. The distribution and abundance of northern quolls from each of the five quoll monitoring sites used in this project.

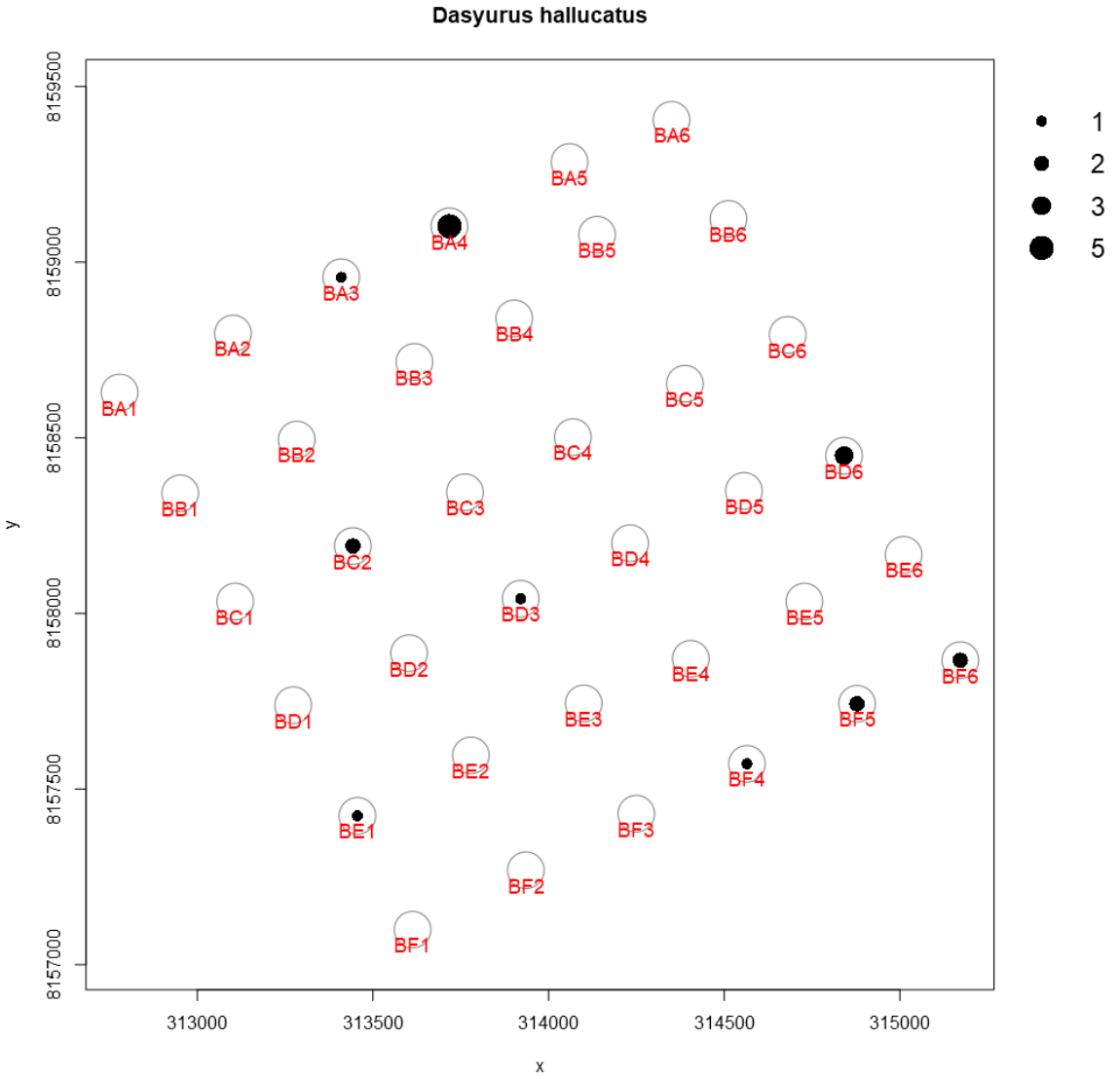

Fig. A1. The distribution of quolls, and the number of individuals detected at each camera trap station during February 2018 monitoring at Site "Brooklyn Reserve". The number of individuals per station is reflected in the size of the black circle, as per the legend to the right of the plot. Plots were generated within R-package "camtrapR". Site locations are illustrated in Map 1.

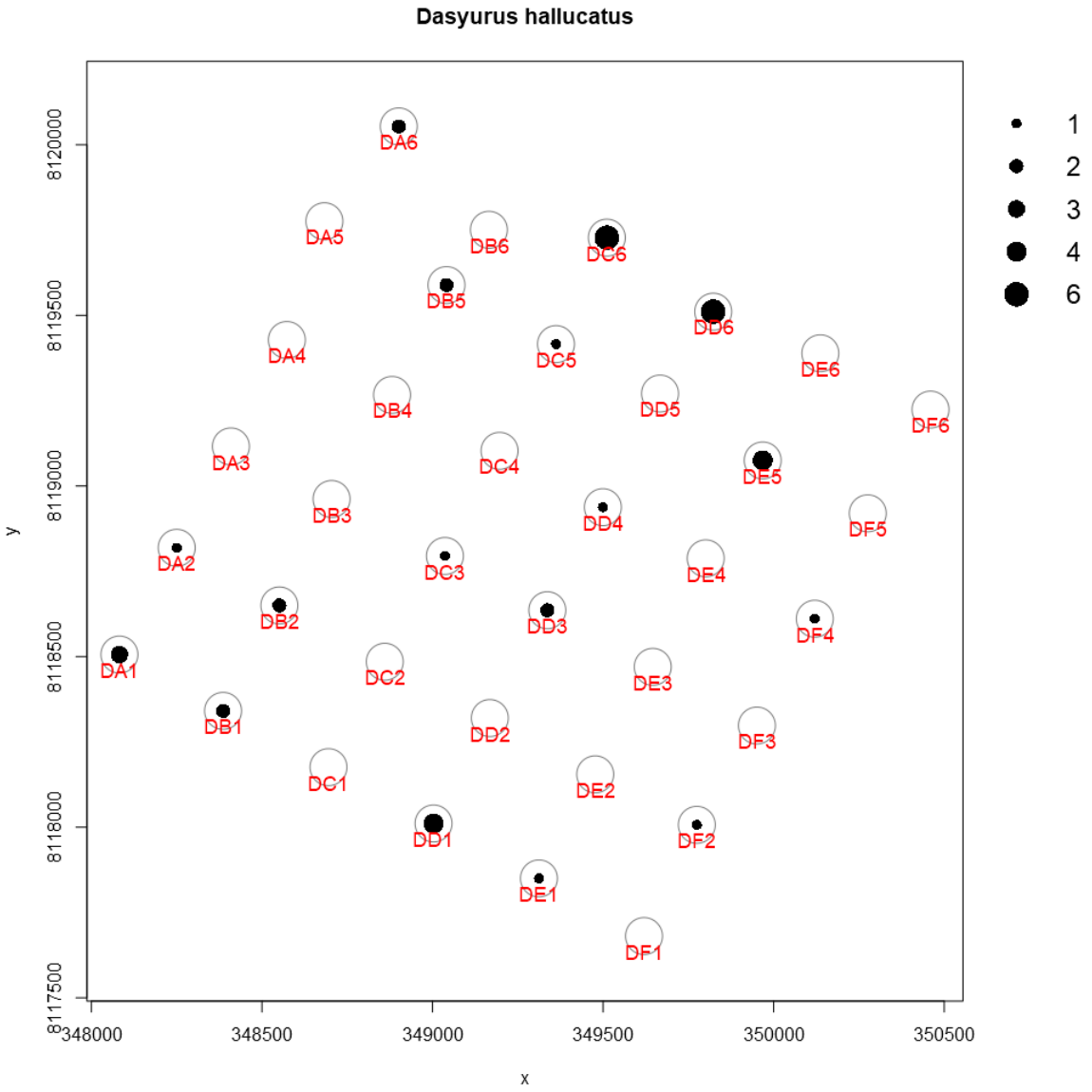

Fig. A2. The distribution of quolls, and the number of individuals detected at each camera trap station during February 2018 monitoring at Site "Davies Creek". The number of individuals per station is reflected in the size of the black circle, as per the legend to the right of the plot. Plots were generated within R-package "camtrapR". Site locations are illustrated in Map 1.

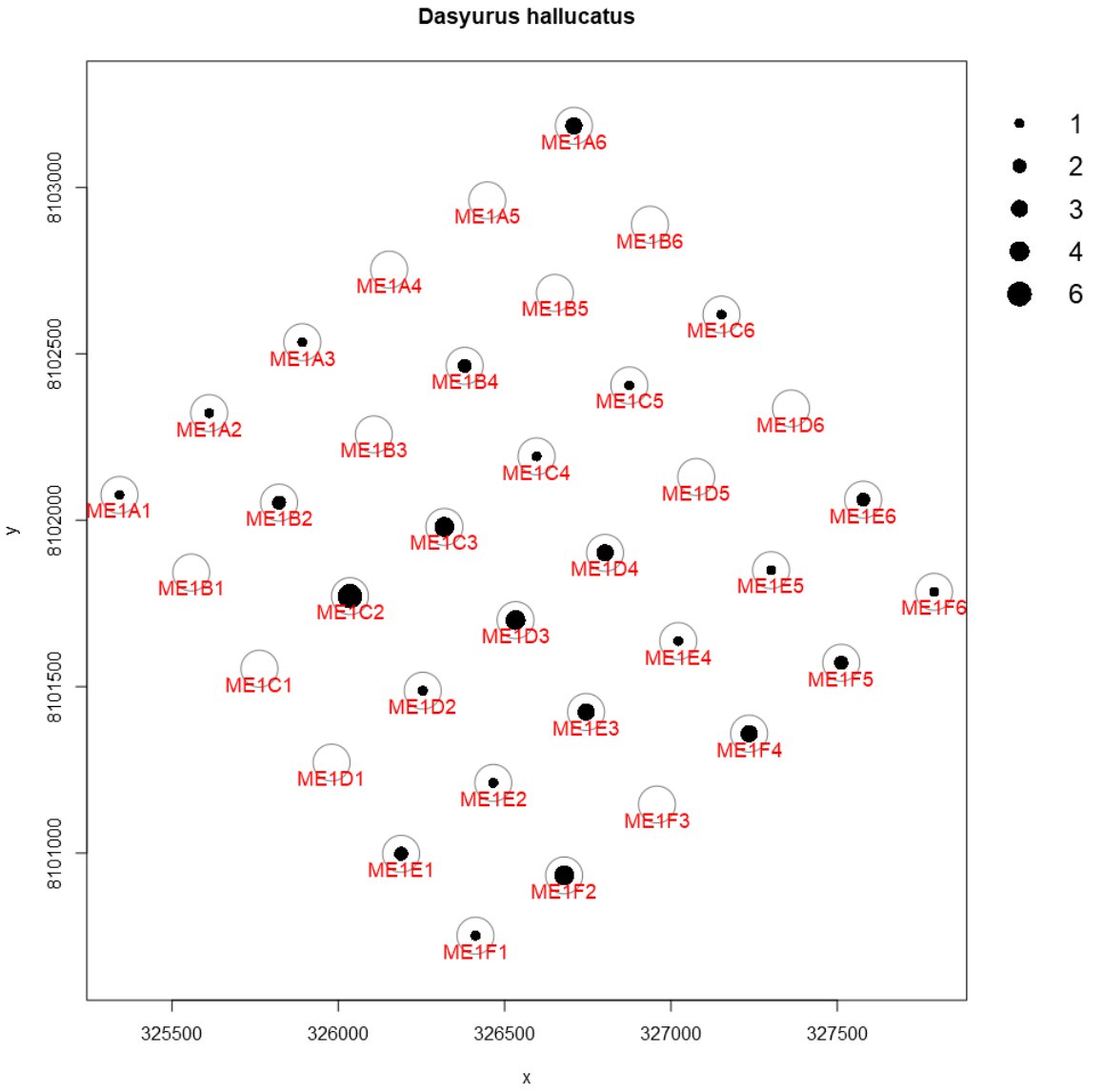

Fig. A3. The distribution of quolls, and the number of individuals detected at each camera trap station during February 2018 monitoring at Site "Mt Emerald 1". The number of individuals per station is reflected in the size of the black circle, as per the legend to the right of the plot. Plots were generated within R-package "camtrapR". Site locations are illustrated in Map 1.

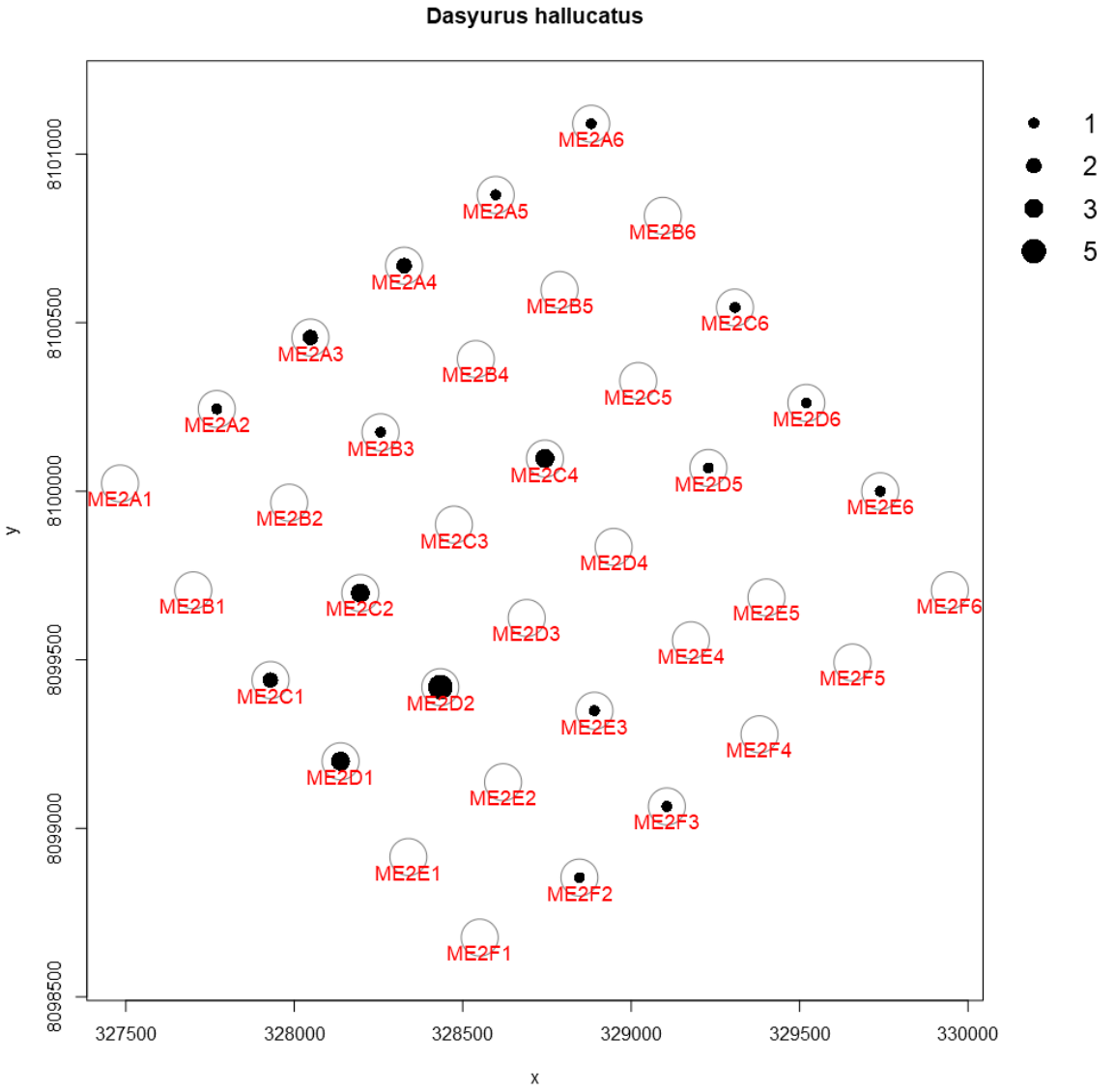

Fig. A1. The distribution of quolls, and the number of individuals detected at each camera trap station during February 2018 monitoring at Site "Mt Emerald 2". The number of individuals per station is reflected in the size of the black circle, as per the legend to the right of the plot. Plots were generated within R-package "camtrapR". Site locations are illustrated in Map 1.

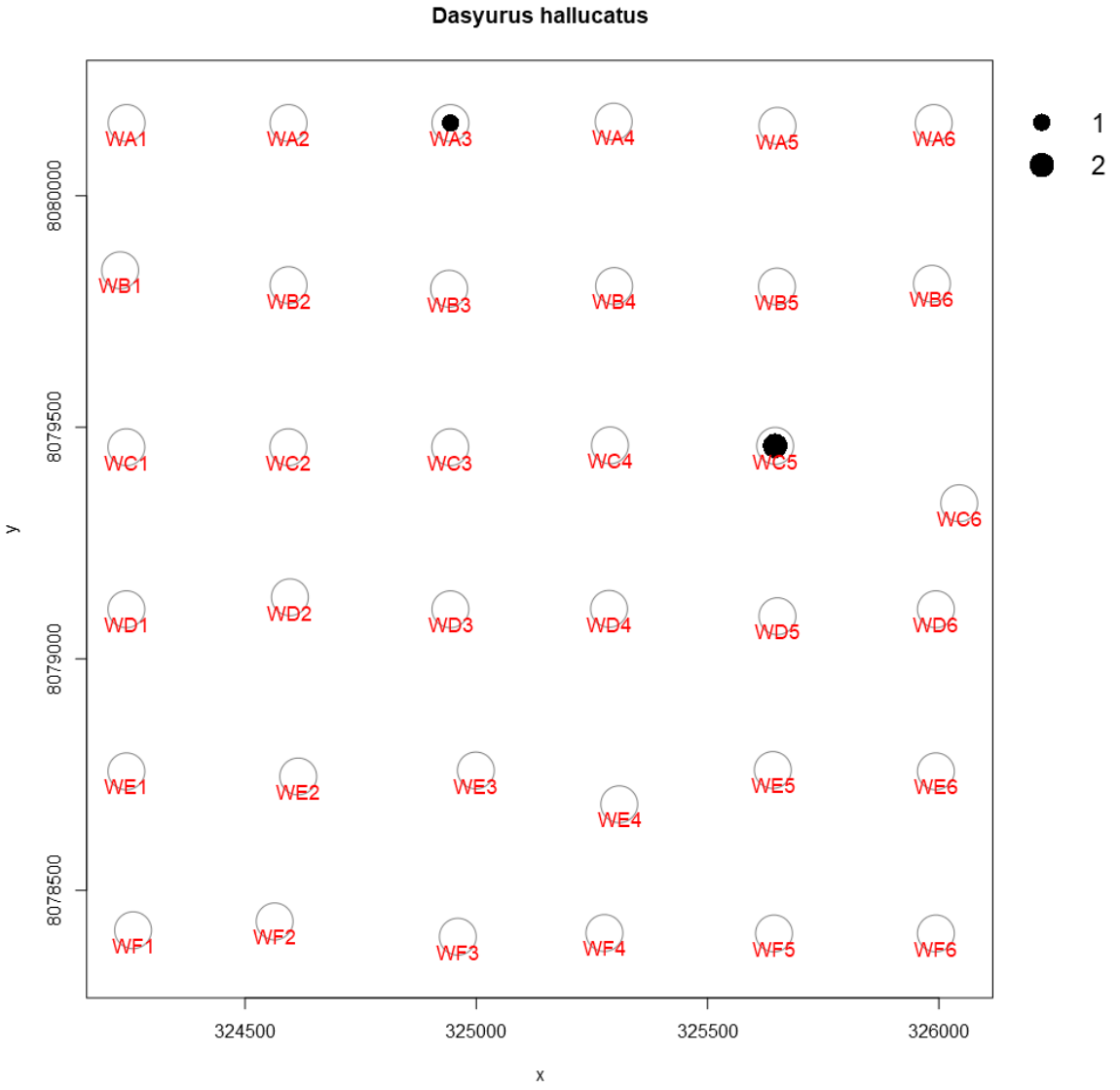

Fig. A5. The distribution of quolls, and the number of individuals detected at each camera trap station during February 2018 monitoring at Site "Walsh River". The number of individuals per station is reflected in the size of the black circle, as per the legend to the right of the plot. Plots were generated within R-package "camtrapR". Site locations are illustrated in Map 1.

References

Efford, M. G. (2016) secr: Spatially explicit capture-recapture models. R package version 2.10.4. http://CRAN.R-project.org/package=secr.

Hines, J. E. (2006). PRESENCE- Software to estimate patch occupancy and related parameters. USGS-PWRC. <http://www.mbr-pwrc.usgs.gov/software/presence.html>.