

Online Resource 1

Seeing the unseen: thermal drone surveys enhance detection and provide first density indices for threatened tree kangaroos in Papua New Guinea's Torricelli Mountain Range

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Table S1. Specifications for the drone and thermal camera models utilised in this study.

Drone	DJI Matrice 4T	DJI Mavic 3T
<i>Weight</i>	1219 g	920 g
<i>Maximum take-off weight (MTOW)</i>	1420 g	1050 g
<i>Maximum flight time</i>	49 min	45 min
<i>Thermal imager</i>	Uncooled VOx Microbolometer	Uncooled VOx Microbolometer
<i>Display Field of View (DFOV)</i>	45°±0.3°	61°
<i>Focal length</i>	Format Equivalent: 53 mm	Format Equivalent: 40 mm
<i>Digital zoom equivalent</i>	28x	28x
<i>Video resolution</i>	640×512@30fps	640×512@30fps
<i>Photo resolution</i>	640×512	640×512
<i>Pixel pitch</i>	12 µm	12 µm
<i>Spectral band</i>	8-14 µm	8-14 µm
<i>Noise Equivalent Temperature Difference (NETD)</i>	≤ 50 mK@f/1.0	≤ 50 mK@f/1.0

Table S2. Arboreal mammal detections from thermal drone surveys conducted during October 2025 in the Torricelli Mountain Range, Sandaun Province, Papua New Guinea. Table includes all detection events recorded during surveys (including duplicate observations of the same individual), showing site name, survey date, detection time (24 h; local time UTC+10), drone platform (M4T = DJI Matrice 4T; M3T = DJI Mavic 3T), elevation (metres above sea level), common and scientific names of detected species, and number of individuals detected per event.

Site	Date	Local time	Drone	Elevation (m ASL)	Common name	Scientific name	Count
Maiwetem	17/10/2025	6:39	M4T	1059	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	17/10/2025	7:19	M4T	1057	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	19/10/2025	6:15	M4T	1150	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	19/10/2025	6:43	M4T	997	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Maiwetem	19/10/2025	6:47	M4T	973	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	19/10/2025	7:13	M4T	1012	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	19/10/2025	7:41	M4T	1066	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	3
Maiwetem	19/10/2025	7:44	M4T	1035	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Maiwetem	17/10/2025	6:58	M3T	1193	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	17/10/2025	7:36	M3T	1089	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Maiwetem	18/10/2025	6:14	M3T	1158	Scott's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	18/10/2025	7:19	M3T	1227	Scott's tree kangaroo	<i>Dendrolagus scottae</i>	2
Maiwetem	18/10/2025	17:24	M3T	1175	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Maiwetem	19/10/2025	6:09	M3T	1214	Scott's tree kangaroo	<i>Dendrolagus scottae</i>	2
Maiwetem	19/10/2025	6:35	M3T	1220	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Maiwetem	19/10/2025	7:01	M3T	1043	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	3
Muku	21/10/2025	17:15	M4T	1068	Common spotted cuscus	<i>Spiloguscus maculatus</i>	1
Muku	21/10/2025	17:42	M4T	1091	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	21/10/2025	17:52	M4T	996	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	22/10/2025	6:22	M4T	934	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	22/10/2025	6:48	M4T	1000	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	22/10/2025	6:54	M4T	738	Common spotted cuscus	<i>Spiloguscus maculatus</i>	1
Muku	22/10/2025	15:28	M4T	954	Golden-mantled tree kangaroo	<i>Dendrolagus pulcherrimus</i>	1
Muku	22/10/2025	15:37	M4T	1055	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	23/10/2025	6:10	M4T	1015	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	23/10/2025	6:36	M4T	888	Golden-mantled tree kangaroo	<i>Dendrolagus pulcherrimus</i>	1
Muku	23/10/2025	6:46	M4T	1042	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	23/10/2025	7:17	M4T	1117	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	23/10/2025	7:43	M4T	1119	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	22/10/2025	6:09	M3T	1237	Golden-mantled tree kangaroo	<i>Dendrolagus pulcherrimus</i>	1
Muku	22/10/2025	6:38	M3T	1303	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	22/10/2025	7:03	M3T	1178	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	22/10/2025	16:00	M3T	1104	Golden-mantled tree kangaroo	<i>Dendrolagus pulcherrimus</i>	1
Muku	23/10/2025	6:52	M3T	962	Golden-mantled tree kangaroo	<i>Dendrolagus pulcherrimus</i>	1
Muku	23/10/2025	6:57	M3T	1030	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	23/10/2025	7:22	M3T	1052	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Muku	24/10/2025	6:43	M3T	919	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Muku	24/10/2025	9:21	M4T	1186	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	1
Rawete	26/10/2025	18:48	M4T	1100	D'Albertis' ringtail possum	<i>Pseudochirops albertisii</i>	2
Rawete	27/10/2025	6:23	M4T	1009	Finsch's tree kangaroo	<i>Dendrolagus inustus finschi</i>	2
Rawete	27/10/2025	6:44	M4T	1284	D'Albertis' ringtail possum	<i>Pseudochirops albertisii</i>	1
Rawete	27/10/2025	7:16	M4T	1110	Common spotted cuscus	<i>Spiloguscus maculatus</i>	1
Rawete	27/10/2025	7:49	M4T	1286	D'Albertis' ringtail possum	<i>Pseudochirops albertisii</i>	1