Supplementary material for

Identifying avian indicators of elevation in the Gondwanan rainforests of Australia

Elliot C. Leach[A,C]*, Chris J. Burwell*[A,B]*, Darryl N. Jones*[A] *and Roger L. Kitching*[A]

[A]Environmental Futures Research Institute, Griffith University, Nathan, Qld 4111, Australia.

[B]Biodiversity Program, Queensland Museum, South Brisbane, Qld 4101, Australia.

[C]Corresponding author. Email: elliot.leach@griffithuni.edu.au

Supplementary Material Appendix 1: Species Codes

The following are the species codes used in the analysis and in the Supplementary Material in alphabetical order. The taxonomic order and nomenclature follows IOC World Bird Names, version 8.1 (see http://goo.gl/QqvwaU). Supplementary Material Appendix 5 lists IOC names alongside names from Christidis and Boles (2008).

ABRT   AUSTRALIAN BRUSHTURKEY (*Alectura lathami*)

ALLY   ALBERT'S LYREBIRD (*Menura alberti*)

AULO   AUSTRALIAN LOGRUNNER (*Orthonyx temminckii*)

BATH   BASSIAN THRUSH (*Zoothera lunulata*)

BFCS   BLACK-FACED CUCKOO-SHRIKE (*Coracina novaehollandiae*)

BFMO   BLACK-FACED MONARCH (*Monarcha melanopsis*)

BRCD   BROWN CUCKOO-DOVE (*Macropygia phasianella*)

BRCU   BRUSH CUCKOO (*Cacomantis variolosus*)

BRGE   BROWN GERYGONE (*Gerygone mouki*)

BRTB   BROWN THORNBILL (*Acanthiza pusilla*)

CROS   CRIMSON ROSELLA (*Platycercus elegans*)

CSTI   CRESTED SHRIKE-TIT (*Falcunculus frontatus*)

EMDO   COMMON EMERALD DOVE (*Chalcophaps longirostris*)

ESPI   EASTERN SPINEBILL (*Acanthorhynchus tenuirostris*)

EWHI   EASTERN WHIPBIRD (*Psophodes olivaceus*)

EYRO   EASTERN YELLOW ROBIN (*Eopsaltria australis*)

FTCU   FAN-TAILED CUCKOO (*Cacomantis flabelliformis*)

GOWH   AUSTRALIAN GOLDEN WHISTLER (*Pachycephala pectoralis*)

GRCA   GREEN CATBIRD (*Ailuroedus crassirostris*)

GRFA   GREY FANTAIL (*Rhipidura albiscapa*)

GRST   GREY SHRIKE-THRUSH (*Colluricincla harmonica*)

KIPA   KING PARROT (*Alisterus scapularis*)

LBSW   LARGE-BILLED SCRUBWREN (*Sericornis magnirostra*)

LEHE   LEWIN'S HONEYEATER (*Meliphaga lewinii*)

LKOO   LAUGHING KOOKABURRA (*Dacelo novaeguineae*)

LSTH   LITTLE SHRIKE-THRUSH (*Colluricincla megarhyncha*)

MSTB   MISTLETOEBIRD (*Dicaeum hirundinaceum*)

NOPI   NOISY PITTA (*Pitta versicolor*)

OBOR   OLIVE-BACKED ORIOLE (*Oriolus sagittatus*)

PCUR   PIED CURRAWONG (*Strepera graculina*)

PRIF   PARADISE RIFLEBIRD (*Ptiloris paradiseus*)

PYRO   PALE-YELLOW ROBIN (*Tregellasia capito*)

RALO   RAINBOW LORIKEET (*Trichoglossus moluccanus*)

RCFD   ROSE-CROWNED FRUIT-DOVE (*Ptilinopus regina*)

RORO   ROSE ROBIN (*Petroica rosea*)

RTTH   RUSSET-TAILED THRUSH (*Zoothera heinei*)

RUFA   RUFOUS FANTAIL (*Rhipidura rufifrons*)

SABB   SATIN BOWERBIRD (*Ptilonorhynchus violaceus*)

SBCU   SHINING-BRONZE CUCKOO (*Chrysococcyx lucidus*)

SCCO   SULPHUR-CRESTED COCKATOO (*Cacatua galerita*)

SCHE   SCARLET HONEYEATER (*Myzomela sanguinolenta*)

SILV   SILVEREYE (*Zosterops lateralis*)

SPDR   SPANGLED DRONGO (*Dicrurus bracteatus*)

SPMO   SPECTACLED MONARCH (*Symposiachrus trivirgatus*)

SPPA   SPOTTED PARDALOTE (*Pardalotus punctatus*)

STPA   STRIATED PARDALOTE (*Pardalotus striatus*)

STTB   STRIATED THORNBILL (*Acanthiza lineata*)

SUFD   SUPERB FRUIT-DOVE (*Ptilinopus superbus*)

THSP   THRUSH SPECIES (SP.) (*Zoothera sp.*)

TOPI   TOPKNOT PIGEON (*Lopholaimus antarcticus*)

VART   VARIED TRILLER (*Lalage leucomela*)

WBSW   WHITE-BROWED SCRUBWREN (*Sericornis frontalis*)

WHPI   WHITE-HEADED PIGEON (*Columba leucomela*)

WOFD   WOMPOO FRUIT-DOVE (*Ptilinopus magnificus*)

WOPI   WONGA PIGEON (*Leucosarcia melanoleuca*)

WTRE   WHITE-THROATED TREECREEPER (*Cormobates leucophaea*)

YFHE   YELLOW-FACED HONEYEATER (*Caligavis chrysops*)

YTBC   YELLOW-TAILED BLACK-COCKATOO (*Calyptorhynchus funereus*)

YTSW   YELLOW-THROATED SCRUBWREN (*Sericornis citreogularis*)

Supplementary Material Appendix 2: ARUs

Here we present the indicators significantly associated with each elevation or elevational range using the 'total' ARU dataset. Species codes are available in Appendix 1. The total number of species includes all individual species as well as all possible pairwise combinations of species available for analysis. The elevation or elevational range in metres above sea level (a.s.l.) is then shown along with the number of associated indicators (#sps.) that met our criteria – an IndVal of >85%. All analysis was performed using the *indicspecies* package in *R*. For more information, such as the code used to run these analyses, please contact elliot.leach@griffithuni.edu.au.

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Total number of species: 1770

List of indicators associated with
each elevation or elevational
range:

300m a.s.l.          #sps.   117
           IndVal    p.value
SCHE+SPPA  1.000     0.002  **
SCHE+YFHE  0.970     0.002  **
SPMO+YFHE  0.961     0.002  **
SCHE+WTRE  0.958     0.003  **
GOWH+SCHE  0.950     0.003  **
CROS+SCHE  0.949     0.005  **
SPPA+YFHE  0.947     0.003  **
RALO+YFHE  0.943     0.002  **
SCHE+SPMO  0.938     0.003  **
LKOO+SCHE  0.937     0.002  **
RALO+SPPA  0.935     0.007  **
RALO+SCHE  0.934     0.003  **
LBSW+SCHE  0.917     0.005  **
SCHE       0.916     0.005  **
EWHI+SCHE  0.916     0.005  **
GRST+SCHE  0.916     0.005  **
LEHE+SCHE  0.916     0.005  **
AULO+SCHE  0.915     0.005  **
SCHE+WBSW  0.910     0.005  **
SBCU+SCHE  0.909     0.006  **
EYRO+SCHE  0.907     0.005  **
WTRE+YFHE  0.907     0.028  *
BRCD+SCHE  0.904     0.005  **
SPMO+SPPA  0.900     0.006  **
RTTH+SCHE  0.897     0.017  *
YFHE       0.895     0.032  *
LEHE+YFHE  0.895     0.032  *
BRGE+SCHE  0.894     0.005  **
KIPA+SPMO  0.894     0.007  **
SILV+SPMO  0.894     0.004  **
KIPA+SCHE  0.892     0.005  **
LKOO+SPMO  0.891     0.007  **
AULO+YFHE  0.891     0.032  *
EWHI+YFHE  0.891     0.032  *
GRST+YFHE  0.890     0.032  *
KIPA+RALO  0.889     0.010  **
RALO+SILV  0.889     0.008  **
GRFA+SCHE  0.887     0.005  **
PCUR+SCHE  0.886     0.005  **
BFMO+SCHE  0.886     0.004  **
WBSW+YFHE  0.881     0.034  *
SILV+SPPA  0.879     0.003  **

BFMO+RALO  0.879     0.009  **
RALO+WOFD  0.876     0.009  **
RUFA+SCHE  0.874     0.007  **
EYRO+YFHE  0.872     0.034  *
BRCD+YFHE  0.872     0.034  *
RALO       0.869     0.011  *
AULO+RALO  0.869     0.011  *
BRCD+RALO  0.869     0.011  *
BRGE+RALO  0.869     0.011  *
BRTB+RALO  0.869     0.011  *
EWHI+RALO  0.869     0.011  *
EYRO+RALO  0.869     0.011  *
GOWH+RALO  0.869     0.011  *
GRFA+RALO  0.869     0.011  *
GRST+RALO  0.869     0.011  *
LBSW+RALO  0.869     0.011  *
LEHE+RALO  0.869     0.011  *
PCUR+RALO  0.869     0.011  *
RALO+WBSW  0.869     0.011  *
RALO+WTRE  0.869     0.011  *
STPA       0.866     0.020  *
AULO+STPA  0.866     0.020  *
BFMO+STPA  0.866     0.020  *
BRCD+STPA  0.866     0.020  *
BRGE+STPA  0.866     0.020  *
BRTB+STPA  0.866     0.020  *
CROS+STPA  0.866     0.020  *
ESPI+STPA  0.866     0.020  *
EWHI+STPA  0.866     0.020  *
EYRO+STPA  0.866     0.020  *
GOWH+STPA  0.866     0.020  *
GRCA+STPA  0.866     0.020  *
GRFA+STPA  0.866     0.020  *
GRST+STPA  0.866     0.020  *
KIPA+STPA  0.866     0.020  *
LBSW+STPA  0.866     0.020  *
LEHE+STPA  0.866     0.020  *
LKOO+RALO  0.866     0.006  **
LKOO+STPA  0.866     0.020  *
PCUR+STPA  0.866     0.020  *
RALO+STPA  0.866     0.020  *
RCFD+STPA  0.866     0.020  *
RTTH+STPA  0.866     0.020  *
RUFA+STPA  0.866     0.020  *
SBCU+STPA  0.866     0.020  *
SCHE+STPA  0.866     0.020  *
SILV+STPA  0.866     0.020  *
SPMO+STPA  0.866     0.020  *
SPPA+STPA  0.866     0.020  *
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	IndVal	p.value	
STPA+WBSW	0.866	0.020	*
STPA+WOFD	0.866	0.020	*
STPA+WTRE	0.866	0.020	*
STPA+YFHE	0.866	0.020	*
GOWH+YFHE	0.863	0.039	*
BFMO+YFHE	0.861	0.024	*
ESPI+SCHE	0.861	0.015	*
RALO+SBCU	0.859	0.012	*
BFMO+SPPA	0.857	0.007	**
GRFA+YFHE	0.854	0.039	*
SPPA	0.853	0.009	**
AULO+SPPA	0.853	0.009	**
BRCD+SPPA	0.853	0.009	**
BRGE+SPPA	0.853	0.009	**
BRTB+SPPA	0.853	0.009	**
EWHI+SPPA	0.853	0.009	**
EYRO+SPPA	0.853	0.009	**
GOWH+SPPA	0.853	0.009	**
GRFA+SPPA	0.853	0.009	**
GRST+SPPA	0.853	0.009	**
LBSW+SPPA	0.853	0.009	**
LEHE+SPPA	0.853	0.009	**
PCUR+SPPA	0.853	0.009	**
SPPA+WBSW	0.853	0.009	**
SPPA+WTRE	0.853	0.009	**
RALO+RUFA	0.851	0.010	**

300-500m a.s.l.   #sps. 75

	IndVal	p.value	
YTBC	0.867	0.019	*
AULO+YTBC	0.867	0.019	*
BRCD+YTBC	0.867	0.019	*
EWHI+YTBC	0.867	0.019	*
EYRO+YTBC	0.867	0.019	*
GOWH+YTBC	0.867	0.019	*
GRFA+YTBC	0.867	0.019	*
GRST+YTBC	0.867	0.019	*
LEHE+YTBC	0.867	0.019	*
PCUR+YTBC	0.867	0.019	*
WBSW+YTBC	0.867	0.019	*
WHPI+YTBC	0.867	0.019	*
WTRE+YTBC	0.867	0.019	*
SCCO	0.866	0.016	*
SPMO	0.866	0.014	*
AULO+SCCO	0.866	0.016	*
AULO+SPMO	0.866	0.014	*
BFMO+SCCO	0.866	0.016	*
BFMO+SPMO	0.866	0.014	*
BRCD+SCCO	0.866	0.016	*
BRCD+SPMO	0.866	0.014	*
BRGE+SCCO	0.866	0.016	*
BRGE+SPMO	0.866	0.014	*
BRTB+SCCO	0.866	0.016	*
BRTB+SPMO	0.866	0.014	*
ESPI+SCCO	0.866	0.014	*
ESPI+SPMO	0.866	0.016	*
EWHI+SCCO	0.866	0.016	*
EWHI+SPMO	0.866	0.014	*
EYRO+SCCO	0.866	0.016	*
EYRO+SPMO	0.866	0.014	*
GOWH+SCCO	0.866	0.016	*
GOWH+SPMO	0.866	0.014	*

	IndVal	p.value	
GRCA+SCCO	0.866	0.016	*
GRCA+SPMO	0.866	0.016	*
GRFA+SCCO	0.866	0.016	*
GRFA+SPMO	0.866	0.014	*
GRST+SCCO	0.866	0.016	*
GRST+SPMO	0.866	0.014	*
KIPA+SCCO	0.866	0.014	*
LBSW+SCCO	0.866	0.016	*
LBSW+SPMO	0.866	0.014	*
LEHE+SCCO	0.866	0.016	*
LEHE+SPMO	0.866	0.014	*
MSTB+SCCO	0.866	0.012	*
PCUR+SCCO	0.866	0.016	*
PCUR+SPMO	0.866	0.014	*
PYRO+SCCO	0.866	0.016	*
RALO+SPMO	0.866	0.017	*
RCFD+SCCO	0.866	0.016	*
RCFD+SPMO	0.866	0.020	*
RTTH+SCCO	0.866	0.016	*
RTTH+SPMO	0.866	0.017	*
RUFA+SCCO	0.866	0.016	*
RUFA+SPMO	0.866	0.013	*
SBCU+SCCO	0.866	0.014	*
SBCU+SPMO	0.866	0.016	*
SCCO+SILV	0.866	0.017	*
SCCO+WBSW	0.866	0.016	*
SCCO+WOFD	0.866	0.016	*
SCCO+WTRE	0.866	0.016	*
SCCO+YTSW	0.866	0.016	*
SPMO+WBSW	0.866	0.014	*
SPMO+WOFD	0.866	0.014	*
SPMO+WTRE	0.866	0.014	*
KIPA+YTBC	0.864	0.022	*
BRTB+YTBC	0.863	0.019	*
SILV+YTBC	0.863	0.035	*
RCFD+SCHE	0.861	0.012	*
BRGE+YTBC	0.860	0.019	*
SCHE+SILV	0.858	0.012	*
BRTB+SCHE	0.858	0.010	**
SCHE+WOFD	0.857	0.010	**
GRCA+SCHE	0.855	0.013	*
RALO+RCFD	0.853	0.013	*

500-700m a.s.l.   #sps. 2

	IndVal	p.value	
ALLY+WOFD	0.937	0.001	***
ALLY+RCFD	0.926	0.029	*

900-1100m a.s.l.   #sps. 27

	IndVal	p.value	
BATH	0.953	0.004	**
ALLY+BATH	0.953	0.004	**
AULO+BATH	0.953	0.004	**
BATH+BRGE	0.953	0.004	**
BATH+BRTB	0.953	0.004	**
BATH+EWHI	0.953	0.004	**
BATH+EYRO	0.953	0.004	**
BATH+GOWH	0.953	0.004	**
BATH+LEHE	0.953	0.004	**
BATH+YTSW	0.953	0.004	**

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BATH+ESPI 0.952   0.004  **        RORO+WOFD 0.851    0.037  *
BATH+GRST 0.952   0.004  **
BATH+GRFA 0.951   0.004  **
BATH+BRCD 0.951   0.004  **        700-1100m a.s.l.   #sps.   3
BATH+WBSW 0.951   0.004  **                  IndVal   p.value
BATH+LBSW 0.946   0.008  **        CROS+WOPI 0.921    0.028  *
BATH+RORO 0.945   0.010  **        CROS+RORO 0.898    0.034  *
BATH+WTRE 0.943   0.008  **        BATH+CROS 0.893    0.018  *
BATH+KIPA 0.943   0.008  **
BATH+PCUR 0.936   0.010  **
BATH+GRCA 0.932   0.010  **        Signif. codes:  0 '***' 0.001 '**'
BATH+SILV 0.931   0.012  *         0.01 '*' 0.05 '.' 0.1 ' ' 1
BATH+WHPI 0.921   0.012  *
BATH+SABB 0.919   0.013  *
BATH+RUFA 0.916   0.014  *
BATH+WOPI 0.908   0.010  **
BATH+NOPI 0.901   0.048  *

300-700m a.s.l.    #sps.   36
          IndVal   p.value
BFMO+WOFD 0.992   0.002  **
RCFD+WOFD 0.991   0.002  **
RTTH+WOFD 0.982   0.002  **
WOFD      0.980   0.002  **
BRGE+WOFD 0.980   0.002  **
EWHI+WOFD 0.980   0.002  **
GRST+WOFD 0.980   0.002  **
LEHE+WOFD 0.980   0.002  **
AULO+WOFD 0.979   0.002  **
BRCD+WOFD 0.979   0.002  **
RUFA+WOFD 0.978   0.003  **
GOWH+WOFD 0.978   0.003  **
GRFA+WOFD 0.978   0.002  **
EYRO+WOFD 0.977   0.002  **
GRCA+WOFD 0.977   0.002  **
WOFD+WTRE 0.976   0.003  **
BRTB+WOFD 0.975   0.002  **
LBSW+WOFD 0.975   0.002  **
WBSW+WOFD 0.974   0.002  **
PCUR+WOFD 0.972   0.002  **
RCFD+RTTH 0.971   0.003  **
KIPA+WOFD 0.969   0.002  **
BFMO+RTTH 0.967   0.003  **
PYRO+WOFD 0.949   0.002  **
NOPI+WOFD 0.939   0.005  **
WOFD+YTSW 0.936   0.007  **
PYRO+RTTH 0.922   0.027  *
MSTB+RTTH 0.915   0.028  *
MSTB+RCFD 0.907   0.039  *
FTCU+WOFD 0.866   0.025  *
RTTH+YTBC 0.866   0.017  *
WOFD+YTBC 0.866   0.016  *
BFMO+FTCU 0.854   0.027  *
FTCU+RCFD 0.853   0.020  *
LBSW+YTBC 0.851   0.031  *
GRCA+YTBC 0.850   0.031  *


500-900m a.s.l.    #sps.   2
          IndVal   p.value
ALLY+RTTH 0.911   0.018  *
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Supplementary Material Appendix 3: Point Counts

Here we present the indicators significantly associated with each elevation or elevational range using the 'total' point counts dataset. Species codes are available in Appendix 1. The total number of species includes all individual species as well as all possible pairwise combinations of species available for analysis. The elevation or elevational range in metres above sea level (a.s.l.) is then shown along with the number of associated indicators (#sps.) that met our criteria – an IndVal of >85%. All analysis was performed using the *indicspecies* package in *R*. For more information, such as the code used to run these analyses, please contact elliot.leach@griffithuni.edu.au.

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Total number of species: 2556

List of indicators associated with
each elevation or elevational
range:

300m a.s.l              #sps.   4
           IndVal     p.value
SCHE+SPPA  1.000      0.002  **
EWHI+SCHE  0.933      0.002  **
PCUR+SCHE  0.882      0.003  **
PRIF+SCHE  0.877      0.005  **


900m a.s.l              #sps.   25
           IndVal     p.value
THSP       0.866      0.022  *
ALLY+THSP  0.866      0.022  *
AULO+THSP  0.866      0.022  *
BRCD+THSP  0.866      0.022  *
BRGE+THSP  0.866      0.022  *
BRTB+THSP  0.866      0.022  *
ESPI+THSP  0.866      0.022  *
EWHI+THSP  0.866      0.022  *
EYRO+THSP  0.866      0.022  *
GOWH+THSP  0.866      0.022  *
GRCA+THSP  0.866      0.022  *
GRFA+THSP  0.866      0.022  *
GRST+THSP  0.866      0.022  *
KIPA+THSP  0.866      0.022  *
LEHE+THSP  0.866      0.022  *
PCUR+THSP  0.866      0.022  *
RORO+THSP  0.866      0.022  *
RUFA+THSP  0.866      0.022  *
SABB+THSP  0.866      0.022  *
SBCU+THSP  0.866      0.022  *
SILV+THSP  0.866      0.022  *
THSP+WBSW  0.866      0.022  *
THSP+WHPI  0.866      0.022  *
THSP+WTRE  0.866      0.022  *
THSP+YTSW  0.866      0.022  *


1100m a.s.l             #sps.   3
           IndVal     p.value
BATH+WOPI  0.935      0.003  **
BATH+NOPI  0.913      0.004  **
BATH+RORO  0.882      0.004  **
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300-500m a.s.l          #sps.   54
           IndVal     p.value
SCHE       0.935      0.002  **
SPMO       0.935      0.001  ***
AULO+SCHE  0.935      0.002  **
AULO+SPMO  0.935      0.001  ***
BFMO+SCHE  0.935      0.002  **
BFMO+SPMO  0.935      0.001  ***
BRCD+SCHE  0.935      0.002  **
BRCD+SPMO  0.935      0.001  ***
BRGE+SCHE  0.935      0.002  **
BRGE+SPMO  0.935      0.001  ***
BRTB+SCHE  0.935      0.002  **
BRTB+SPMO  0.935      0.001  ***
EYRO+SCHE  0.935      0.002  **
EYRO+SPMO  0.935      0.001  ***
GOWH+SCHE  0.935      0.002  **
GOWH+SPMO  0.935      0.001  ***
GRFA+SCHE  0.935      0.002  **
GRFA+SPMO  0.935      0.001  ***
GRST+SCHE  0.935      0.002  **
GRST+SPMO  0.935      0.001  ***
LEHE+SCHE  0.935      0.002  **
LEHE+SPMO  0.935      0.001  ***
MSTB+SCHE  0.935      0.002  **
MSTB+SPMO  0.935      0.001  ***
NOPI+SPMO  0.935      0.001  ***
PYRO+SPMO  0.935      0.001  ***
RCFD+SCHE  0.935      0.002  **
RCFD+SPMO  0.935      0.001  ***
RUFA+SCHE  0.935      0.002  **
RUFA+SPMO  0.935      0.001  ***
SCHE+SILV  0.935      0.002  **
SCHE+WBSW  0.935      0.002  **
SCHE+WOFD  0.935      0.002  **
SCHE+WTRE  0.935      0.002  **
SILV+SPMO  0.935      0.001  ***
SPMO+WBSW  0.935      0.001  ***
SPMO+WOFD  0.935      0.001  ***
SPMO+WTRE  0.935      0.001  ***
SPMO+YTSW  0.935      0.001  ***
RCFD+RUFA  0.906      0.012  *
RUFA+WOFD  0.884      0.025  *
EWHI+SPMO  0.866      0.014  *
GRCA+SPMO  0.866      0.013  *
KIPA+SCHE  0.866      0.006  **
KIPA+SPMO  0.866      0.008  **
LBSW+SCHE  0.866      0.007  **
```

```
LBSW+SPMO 0.866   0.015  *        AULO+RCFD 0.953   0.004  **
NOPI+SCHE 0.866   0.009  **       BRCD+RCFD 0.953   0.004  **
PCUR+SPMO 0.866   0.013  *        EYRO+WOFD 0.953   0.002  **
PRIF+SPMO 0.866   0.010  **       RCFD+WTRE 0.953   0.004  **
PYRO+SCHE 0.866   0.011  *        BRTB+RCFD 0.952   0.005  **
RTTH+SPMO 0.866   0.005  **       GRST+WOFD 0.952   0.001  ***
SCHE+SPMO 0.866   0.011  *        RCFD+SILV 0.951   0.005  **
SCHE+YTSW 0.866   0.010  **       MSTB+WOFD 0.947   0.002  **
                                  EYRO+RCFD 0.946   0.006  **
                                  GRST+RCFD 0.946   0.004  **
500-700m a.s.l    #sps.  2        PCUR+WOFD 0.943   0.001  ***
          IndVal  p.value         PRIF+RCFD 0.941   0.003  **
GRCA+RCFD 0.935   0.003  **        PRIF+WOFD 0.930   0.005  **
GRCA+WOFD 0.927   0.002  **        PCUR+PRIF 0.926   0.007  **
                                  LBSW+WOFD 0.925   0.007  **
                                  EWHI+WOFD 0.924   0.004  **
                                  BFMO+WOFD 0.921   0.003  **
900-1100m a.s.l   #sps.  22       WOFD+YTSW 0.921   0.005  **
          IndVal  p.value         KIPA+RCFD 0.913   0.009  **
ALLY+RORO 0.907   0.004  **        EWHI+RCFD 0.912   0.022  *
RORO+SBCU 0.907   0.006  **        MSTB+PRIF 0.908   0.022  *
BATH      0.866   0.010  **        RCFD+YTSW 0.908   0.017  *
ALLY+BATH 0.866   0.010  **        WBSW+WOFD 0.906   0.018  *
AULO+BATH 0.866   0.010  **        KIPA+WOFD 0.904   0.007  **
BATH+BRCD 0.866   0.010  **        PYRO+WOFD 0.894   0.013  *
BATH+BRGE 0.866   0.010  **        PYRO+RCFD 0.892   0.018  *
BATH+BRTB 0.866   0.010  **
BATH+ESPI 0.866   0.010  **
BATH+EWHI 0.866   0.010  **
BATH+EYRO 0.866   0.010  **       500-900m a.s.l    #sps.  4
BATH+GOWH 0.866   0.010  **                 IndVal  p.value
BATH+GRFA 0.866   0.010  **        GRCA      0.953   0.023  *
BATH+GRST 0.866   0.010  **        BRGE+GRCA 0.953   0.023  *
BATH+KIPA 0.866   0.010  **        GRCA+LEHE 0.953   0.023  *
BATH+LEHE 0.866   0.010  **        GRCA+LBSW 0.910   0.025  *
BATH+RUFA 0.866   0.010  **
BATH+SBCU 0.866   0.010  **
BATH+SILV 0.866   0.010  **
BATH+WBSW 0.866   0.010  **        700-1100m a.s.l   #sps.  4
BATH+WTRE 0.866   0.011  *                   IndVal  p.value
BATH+YTSW 0.866   0.010  **        ALLY+ESPI 0.898   0.036  *
                                  EWHI+RORO 0.890   0.016  *
                                  ESPI+RORO 0.866   0.030  *
                                  RORO+SABB 0.866   0.018  *
300-700m a.s.l    #sps.  45       Signif. codes:  0 '***' 0.001 '**'
          IndVal  p.value         0.01 '*' 0.05 '.' 0.1 ' ' 1
RCFD+WOFD 1.000   0.001  ***
MSTB+RCFD 0.984   0.002  **
WOFD+WTRE 0.969   0.001  ***
WOFD      0.968   0.001  ***
BRGE+WOFD 0.968   0.001  ***
LEHE+WOFD 0.968   0.001  ***
GRFA+WOFD 0.966   0.001  ***
GOWH+WOFD 0.965   0.001  ***
AULO+WOFD 0.962   0.001  ***
SILV+WOFD 0.962   0.001  ***
BRCD+WOFD 0.960   0.001  ***
GRFA+RCFD 0.959   0.002  **
BRTB+WOFD 0.958   0.001  ***
RCFD      0.956   0.004  **
LEHE+RCFD 0.956   0.004  **
BRGE+RCFD 0.955   0.004  **
GOWH+RCFD 0.955   0.004  **
```

Supplementary Material Appendix 4: Seasonal changes in indicators

Here we present the indicators significantly associated with each elevation or elevational range using the 'seasonal' ARU and point counts datasets. Species codes are available in Appendix 1. The total number of species includes all individual species as well as all possible pairwise combinations of species available for analysis in that season. The elevation or elevational range in metres above sea level (a.s.l.) is then shown along with the number of associated indicators (#sps.) that met our criteria – an IndVal of >85%. All analysis was performed using the *indicspecies* package in *R*. For more information, such as the code used to run these analyses, please contact elliot.leach@griffithuni.edu.au.

ARUs

Spring

Total number of species: 1770

List of indicators associated with each elevation or elevational range:

500-900m a.s.l.   #sps.   22

	IndVal	p.value	
BFMO+RCFD	1.000	0.046	*
BFMO+WOFD	0.993	0.046	*
RCFD	0.982	0.023	*
AULO+RCFD	0.982	0.023	*
BRCD+RCFD	0.982	0.023	*
BRGE+RCFD	0.982	0.023	*
EWHI+RCFD	0.982	0.023	*
EYRO+RCFD	0.982	0.023	*
GOWH+RCFD	0.982	0.023	*
GRFA+RCFD	0.982	0.023	*
GRST+RCFD	0.982	0.023	*
LEHE+RCFD	0.982	0.023	*
RCFD+WOFD	0.982	0.023	*
RCFD+WHPI	0.981	0.018	*
LBSW+RCFD	0.981	0.046	*
RCFD+RUFA	0.981	0.046	*
RCFD+WTRE	0.979	0.018	*
PCUR+RCFD	0.976	0.046	*
BRTB+RCFD	0.976	0.046	*
KIPA+RCFD	0.972	0.046	*
PRIF+RCFD	0.972	0.046	*
RCFD+WBSW	0.971	0.046	*

Summer

Total number of species: 1770

List of indicators associated with each elevation or elevational range:

500-700m a.s.l.   #sps.   1

	IndVal	p.value	
WHPI+WOFD	0.98	0.033	*

300-700m a.s.l.   #sps.   3

	IndVal	p.value	
RCFD+YTSW	0.993	0.044	*
PRIF+SILV	0.983	0.043	*
PYRO+RUFA	0.978	0.045	*

500-900m a.s.l.   #sps.   1

	IndVal	p.value	
WBSW+WOFD	0.978	0.027	*

Autumn

Total number of species: 1770

List of indicators associated with each elevation or elevational range:

500-700m a.s.l.   #sps.   4

	Indval	p.value	
ALLY+WOFD	1	0.046	*
PRIF+WOFD	1	0.046	*
PYRO+WOFD	1	0.046	*
WOFD+YTSW	1	0.046	*

Winter

Total number of species: 1770

List of indicators associated with each elevation or elevational range:

500-700m a.s.l.   #sps.   30

	IndVal	p.value	
THSP	1.000	0.044	*
ALLY+THSP	1.000	0.044	*
AULO+THSP	1.000	0.044	*
BRCD+THSP	1.000	0.044	*
BRGE+THSP	1.000	0.044	*
BRTB+THSP	1.000	0.044	*
CSTI+PRIF	1.000	0.044	*
CSTI+THSP	1.000	0.044	*
ESPI+THSP	1.000	0.044	*
EWHI+THSP	1.000	0.044	*
EYRO+THSP	1.000	0.044	*

```
GOWH+THSP 1.000   0.044 *          LEHE+SPMO 0.866   0.019 *
GRCA+THSP 1.000   0.044 *
GRFA+THSP 1.000   0.044 *          500-700m a.s.l      #sps.   3
GRST+THSP 1.000   0.044 *                    IndVal  p.value
LBSW+THSP 1.000   0.044 *          GRCA+PRIF 0.892   0.007 **
LEHE+THSP 1.000   0.044 *          GRCA      0.891   0.009 **
LKOO+THSP 1.000   0.044 *          GRCA+LBSW 0.866   0.019 *
MSTB+THSP 1.000   0.044 *
PCUR+THSP 1.000   0.044 *          700-1100m a.s.l     #sps.   2
PRIF+THSP 1.000   0.044 *                    IndVal  p.value
PYRO+THSP 1.000   0.044 *          BRTB+YTSW 0.877   0.027 *
RTTH+THSP 1.000   0.044 *          EWHI+YTSW 0.868   0.042 *
SABB+THSP 1.000   0.044 *
THSP+WBSW 1.000   0.044 *
THSP+WTRE 1.000   0.044 *
THSP+YTSW 1.000   0.044 *          Summer
GRCA+LKOO 0.965   0.044 *
LKOO+SABB 0.965   0.044 *          Total number of species: 1378
CSTI+LKOO 0.943   0.044 *
                                   List of indicators associated with
Signif. codes:  0 '***' 0.001 '**' each elevation or elevational
0.01 '*' 0.05 '.' 0.1 ' ' 1        range:

                                   300m a.s.l          #sps.  10
                                             IndVal  p.value
Point Counts                       SCHE      0.935   0.001 ***
                                   BRCD+SCHE 0.935   0.001 ***
Spring                             BRGE+SCHE 0.935   0.001 ***
                                   LEHE+SCHE 0.935   0.001 ***
Total number of species: 1596      RCFD+SCHE 0.935   0.001 ***
                                   AULO+SCHE 0.926   0.002 **
List of indicators associated with BFMO+SCHE 0.926   0.002 **
each elevation or elevational      GOWH+SCHE 0.913   0.003 **
range:                             GRFA+SCHE 0.913   0.005 **
                                   EWHI+SCHE 0.866   0.017 *
500m a.s.l          #sps.   1
          IndVal  p.value
GRCA+SPMO 0.866   0.015 *
                                   300-500m a.s.l      #sps.   1
1100m a.s.l         #sps.  16                IndVal  p.value
          IndVal  p.value          BFMO+RCFD 0.874   0.010 **
BRTB+RORO 1.000   0.003 **
EYRO+RORO 1.000   0.003 **         500-700m a.s.l      #sps.   5
GRST+RORO 1.000   0.003 **                   IndVal  p.value
RORO      0.894   0.011 *          GRCA+RCFD 0.946   0.001 ***
BRGE+RORO 0.894   0.011 *          RCFD+YTSW 0.929   0.003 **
EWHI+RORO 0.894   0.011 *          WOFD+YTSW 0.904   0.004 **
GOWH+RORO 0.894   0.011 *          GRCA+KIPA 0.901   0.008 **
LEHE+RORO 0.894   0.011 *          GRCA+WOFD 0.899   0.004 **
RORO+YTSW 0.894   0.011 *
AULO+RORO 0.866   0.022 *          700-900m a.s.l      #sps.   8
CROS+RORO 0.866   0.021 *                    IndVal  p.value
GRST+WOPI 0.866   0.017 *          EYRO+WHPI 0.935   0.004 **
NOPI+RORO 0.866   0.022 *          WHPI+YTSW 0.926   0.003 **
RORO+SBCU 0.866   0.021 *          WHPI      0.903   0.012 *
RORO+SILV 0.866   0.016 *          WHPI+WTRE 0.886   0.008 **
RORO+WOPI 0.866   0.017 *          BRGE+WHPI 0.885   0.015 *
                                   BRCD+WHPI 0.879   0.016 *
                                   LEHE+WHPI 0.879   0.015 *
300-500m a.s.l      #sps.   3      AULO+WHPI 0.862   0.018 *
          IndVal  p.value
SPMO      0.866   0.019 *          300-700m a.s.l      #sps.  11
GOWH+SPMO 0.866   0.013 *                    IndVal  p.value
```

BRCD+RCFD 0.949   0.005 **
RCFD   0.946   0.005 **
LEHE+RCFD 0.944   0.005 **
BRGE+RCFD 0.939   0.005 **
RCFD+WOFD 0.913   0.005 **
WOFD   0.891   0.020 *
LEHE+WOFD 0.891   0.020 *
BRCD+WOFD 0.890   0.021 *
BRGE+WOFD 0.890   0.023 *
GOWH+WOFD 0.880   0.023 *
GRFA+RCFD 0.880   0.026 *

500-900m a.s.l   #sps. 1
          IndVal   p.value
GRCA+YTSW 0.868   0.05 *

700-1100m a.s.l   #sps. 1
          Indval   p.value
EYRO+YTSW 0.953   0.002 **

Autumn

Total number of species: 1081

List of indicators associated with each elevation or elevational range:

300m a.s.l   #sps. 9
          IndVal   p.value
BRCD+GRFA 0.866   0.026 *
BRCD+PCUR 0.866   0.021 *
BRCD+SCHE 0.866   0.025 *
BRCD+SPPA 0.866   0.022 *
BRCD+WTRE 0.866   0.021 *
GRFA+PCUR 0.866   0.026 *
PCUR+SCHE 0.866   0.025 *
PCUR+SPPA 0.866   0.022 *
PCUR+WHPI 0.866   0.026 *

900m a.s.l   #sps. 1
          IndVal   p.value
KIPA+RORO 0.894   0.008 **

900-1100m a.s.l   #sps. 1
          IndVal   p.value
BRTB+RORO 0.866   0.015 *

Winter

Total number of species: 1128

List of indicators associated with each elevation or elevational range:

500m a.s.l   #sps. 8
          IndVal   p.value
GOWH+GRCA 1.000   0.002 **
GOWH+WBSW 0.913   0.004 **

GOWH+PRIF 0.866   0.015 *
GOWH+WOFD 0.866   0.015 *
GRCA+GRFA 0.866   0.021 *
GRCA+KIPA 0.866   0.015 *
GRCA+PYRO 0.866   0.023 *
KIPA+WOFD 0.866   0.015 *

700m a.s.l   #sps.   16
          IndVal   p.value
EYRO+PRIF 1.000   0.002 **
ESPI+PRIF 0.894   0.004 **
PCUR+PRIF 0.894   0.004 **
CROS+ESPI 0.866   0.010 **
CROS+EYRO 0.866   0.010 **
CROS+PCUR 0.866   0.010 **
ESPI+WHPI 0.866   0.016 *
PRIF+WHPI 0.866   0.016 *

300-500m a.s.l   #sps. 1
          Indval   p.value
AULO+GOWH 0.866   0.007 **

500-700m a.s.l   #sps. 10
          Indval   p.value
PRIF   0.935   0.001 ***
AULO+PRIF 0.935   0.001 ***
BRGE+PRIF 0.935   0.001 ***
BRTB+PRIF 0.935   0.001 ***
LEHE+PRIF 0.935   0.001 ***
PRIF+WTRE 0.935   0.001 ***
PRIF+YTSW 0.935   0.001 ***
EWHI+PRIF 0.866   0.005 **
MSTB+PRIF 0.866   0.006 **
PRIF+WBSW 0.866   0.008 **

700-900m a.s.l   #sps. 5
          IndVal   p.value
BRTB+ESPI 0.935   0.001 ***
ESPI+MSTB 0.935   0.001 ***
ESPI+EYRO 0.920   0.001 ***
ESPI+LEHE 0.889   0.009 **
AULO+ESPI 0.882   0.004 **

300-700m a.s.l   #sps. 1
          IndVal   p.value
AULO+WTRE 0.913   0.021 *

700-1100m a.s.l   #sps. 1
          IndVal   p.value
ESPI+YTSW 0.889   0.017 *

Signif. codes: 0 '***' 0.001 '**'
0.01 '*' 0.05 '.' 0.1 ' ' 1

Supplementary Material Appendix 5: Species Names

The taxonomic order and nomenclature in this paper follows IOC World Bird Names, version 8.1. Some readers may be more familiar with the taxonomy of Australian birds proposed by Christidis and Boles (2008). Since that time there have been a number of taxonomic revisions published in the literature. Please see http://goo.gl/QqvwaU for a list of all bird species found in Australia based on the 2018 IOC checklist.

The following table provides a comparison between the taxonomy and nomenclature used in Christidis and Boles (2008), and the taxonomy and nomenclature used in version 8.1 of the IOC World Bird Names. The common names as given in Christidis and Boles (2008) are listed in alphabetical order.

Christidis and Boles Taxonomy of Australian Birds (2008)		IOC World Bird Names version 8.1 (2018)	
Common Name	Scientific Name	Common Name	Scientific Name
Albert's Lyrebird	*Menura alberti*	Albert's Lyrebird	*Menura alberti*
Australian Brush-turkey	*Alectura lathami*	Australian Brushturkey	*Alectura lathami*
Australian King-Parrot	*Alisterus scapularis*	Australian King Parrot	*Alisterus scapularis*
Australian Logrunner	*Orthonyx temminckii*	Australian Logrunner	*Orthonyx temminckii*
Bassian Thrush	*Zoothera lunulata*	Bassian Thrush	*Zoothera lunulata*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	Black-faced Cuckooshrike	*Coracina novaehollandiae*
Black-faced Monarch	*Monarcha melanopsis*	Black-faced Monarch	*Monarcha melanopsis*
Brown Cuckoo-Dove	*Macropygia amboinensis*	Brown Cuckoo-Dove	*Macropygia phasianella*
Brown Gerygone	*Gerygone mouki*	Brown Gerygone	*Gerygone mouki*
Brown Thornbill	*Acanthiza pusilla*	Brown Thornbill	*Acanthiza pusilla*
Brush Cuckoo	*Cacomantis variolosus*	Brush Cuckoo	*Cacomantis variolosus*
Crested Shrike-tit	*Falcunculus frontatus*	Crested Shriketit	*Falcunculus frontatus*
Crimson Rosella	*Platycercus elegans*	Crimson Rosella	*Platycercus elegans*
Eastern Spinebill	*Acanthorhynchus tenuirostris*	Eastern Spinebill	*Acanthorhynchus tenuirostris*
Eastern Whipbird	*Psophodes olivaceous*	Eastern Whipbird	*Psophodes olivaceous*
Eastern Yellow Robin	*Eopsaltria australis*	Eastern Yellow Robin	*Eopsaltria australis*
Emerald Dove	*Chalcophaps indica*	Common Emerald Dove	*Chalcophaps indica*
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Golden Whistler	*Pachycephala pectoralis*	Australian Golden Whistler	*Pachycephala pectoralis*
Green Catbird	*Ailuroedus crassirostris*	Green Catbird	*Ailuroedus crassirostris*
Grey Fantail	*Rhipidura albiscapa*	Grey Fantail	*Rhipidura albiscapa*
Grey Shrike-thrush	*Colluricincla harmonica*	Grey Shrikethrush	*Colluricincla harmonica*
Large-billed Scrubwren	*Sericornis magnirostra*	Large-billed Scrubwren	*Sericornis magnirostra*
Laughing Kookaburra	*Dacelo novaeguineae*	Laughing Kookaburra	*Dacelo novaeguineae*
Lewin's Honeyeater	*Meliphaga lewinii*	Lewin's Honeyeater	*Meliphaga lewinii*
Little Shrike-thrush	*Colluricincla megarhyncha*	Little Shrikethrush	*Colluricincla megarhyncha*

Mistletoebird	*Dicaeum hirundinaceum*	Mistletoebird	*Dicaeum hirundinaceum*
Noisy Pitta	*Pitta versicolor*	Noisy Pitta	*Pitta versicolor*
Olive-backed Oriole	*Oriolus sagittatus*	Olive-backed Oriole	*Oriolus sagittatus*
Pale-yellow Robin	*Tregellasia capito*	Pale-yellow Robin	*Tregellasia capito*
Paradise Riflebird	*Ptiloris paradiseus*	Paradise Riflebird	*Ptiloris paradiseus*
Pied Currawong	*Strepera graculina*	Pied Currawong	*Strepera graculina*
Rainbow Lorikeet	*Trichoglossus haematodus*	Rainbow Lorikeet	*Trichoglossus moluccanus*
Regent Bowerbird	*Sericulus chrysocephalus*	Regent Bowerbird	*Sericulus chrysocephalus*
Rose Robin	*Petroica rosea*	Rose Robin	*Petroica rosea*
Rose-crowned Fruit-Dove	*Ptilinopus regina*	Rose-crowned Fruit Dove	*Ptilinopus regina*
Rufous Fantail	*Rhipidura rufifrons*	Rufous Fantail	*Rhipidura rufifrons*
Russet-tailed Thrush	*Zoothera heinei*	Russet-tailed Thrush	*Zoothera heinei*
Satin Bowerbird	*Ptilonorhynchus violaceus*	Satin Bowerbird	*Ptilonorhynchus violaceus*
Scarlet Honeyeater	*Myzomela sanguinolenta*	Scarlet Myzomela	*Myzomela sanguinolenta*
Shining Bronze-Cuckoo	*Chrysococcyx lucidus*	Shining Bronze Cuckoo	*Chrysococcyx lucidus*
Silvereye	*Zosterops lateralis*	Silvereye	*Zosterops lateralis*
Spangled Drongo	*Dicrurus bracteatus*	Spangled Drongo	*Dicrurus bracteatus*
Spectacled Monarch	*Symposiachrus trivirgatus*	Spectacled Monarch	*Symposiachrus trivirgatus*
Spotted Pardalote	*Pardalotus punctatus*	Spotted Pardalote	*Pardalotus punctatus*
Striated Pardalote	*Pardalotus striatus*	Striated Pardalote	*Pardalotus striatus*
Striated Thornbill	*Acanthiza lineata*	Striated Thornbill	*Acanthiza lineata*
Sulphur-crested Cockatoo	*Cacatua galerita*	Sulphur-crested Cockatoo	*Cacatua galerita*
Superb Fruit-Dove	*Ptilinopus superbus*	Superb Fruit Dove	*Ptilinopus superbus*
Topknot Pigeon	*Lopholamus antarcticus*	Topknot Pigeon	*Lopholamus antarcticus*
Varied Triller	*Lalage leucomela*	Varied Triller	*Lalage leucomela*
White-browed Scrubwren	*Sericornis frontalis*	White-browed Scrubwren	*Sericornis frontalis*
White-headed Pigeon	*Columba leucomela*	White-headed Pigeon	*Columba leucomela*
White-throated Treecreeper	*Cormobates leucophaea*	White-throated Treecreeper	*Cormobates leucophaea*
Wompoo Fruit-Dove	*Ptilinopus magnificus*	Wompoo Fruit Dove	*Ptilinopus magnificus*
Wonga Pigeon	*Leucosarcia picata*	Wonga Pigeon	*Leucosarcia melanoleuca*
Yellow-faced Honeyeater	*Lichenostomus chrysops*	Yellow-faced Honeyeater	*Caligavis chrysops*
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	Yellow-tailed Black Cockatoo	*Calyptorhynchus funereus*
Yellow-throated Scrubwren	*Sericornis citreogularis*	Yellow-throated Scrubwren	*Sericornis citreogularis*