APPENDIX A

Predicted Threatened Species (Ecosystem Credit)

Predicted Threatened Species (Ecosystem Credit)

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
Regent Honeyeater (foraging) *Anthochaera phrygia*	CE	CE	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Dusky Woodswallow *Artamus cyanopterus*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Gang-gang Cockatoo (foraging) *Callocephalon fimbriatum*	V	V	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Speckled Warbler *Chthonicola sagittata*	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Spotted Harrier *Circus assimilis*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae*	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
Varied Sittella *Daphoenositta chrysoptera*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Spotted-tailed Quoll *Dasyurus maculatus*	V	E	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Black-necked Stork *Ephippiorhynchus asiaticus*	E	-	Moderate	-	NSW South Western Slopes/Inland Slopes	335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Eastern False Pipistrelle *Falsistrellus tasmaniensis*	V	-	High	-	NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
Little Lorikeet *Glossopsitta pusilla*	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Painted Honeyeater *Grantiella picta*	V	V	Moderate	Other; Mistletoes present at a density of greater than five mistletoes per hectare	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
White-bellied Sea-Eagle (foraging) *Haliaeetus leucogaster*	V	-	High	Waterbodies; Within 1km of a river, lake, large dam or creek, wetland and coastline.	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Little Eagle (foraging) *Hieraaetus morphnoides*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
					Slopes/Inland Slopes	335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Swift Parrot (foraging) ***Lathamus discolor***	E	CE	Moderate	-	NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Square-tailed Kite (foraging) ***Lophoictinia isura***	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Hooded Robin (south-eastern form) ***Melanodryas cucullata***	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Black-chinned Honeyeater (eastern	V	-	Moderate	-	South Eastern	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
subspecies) *Melithreptus gularis*					Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Large Bent-winged Bat (foraging) *Miniopterus orianae oceanensis*	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Turquoise Parrot *Neophema pulchella*	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Barking Owl (foraging) *Ninox connivens*	V	-	High	-	NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion

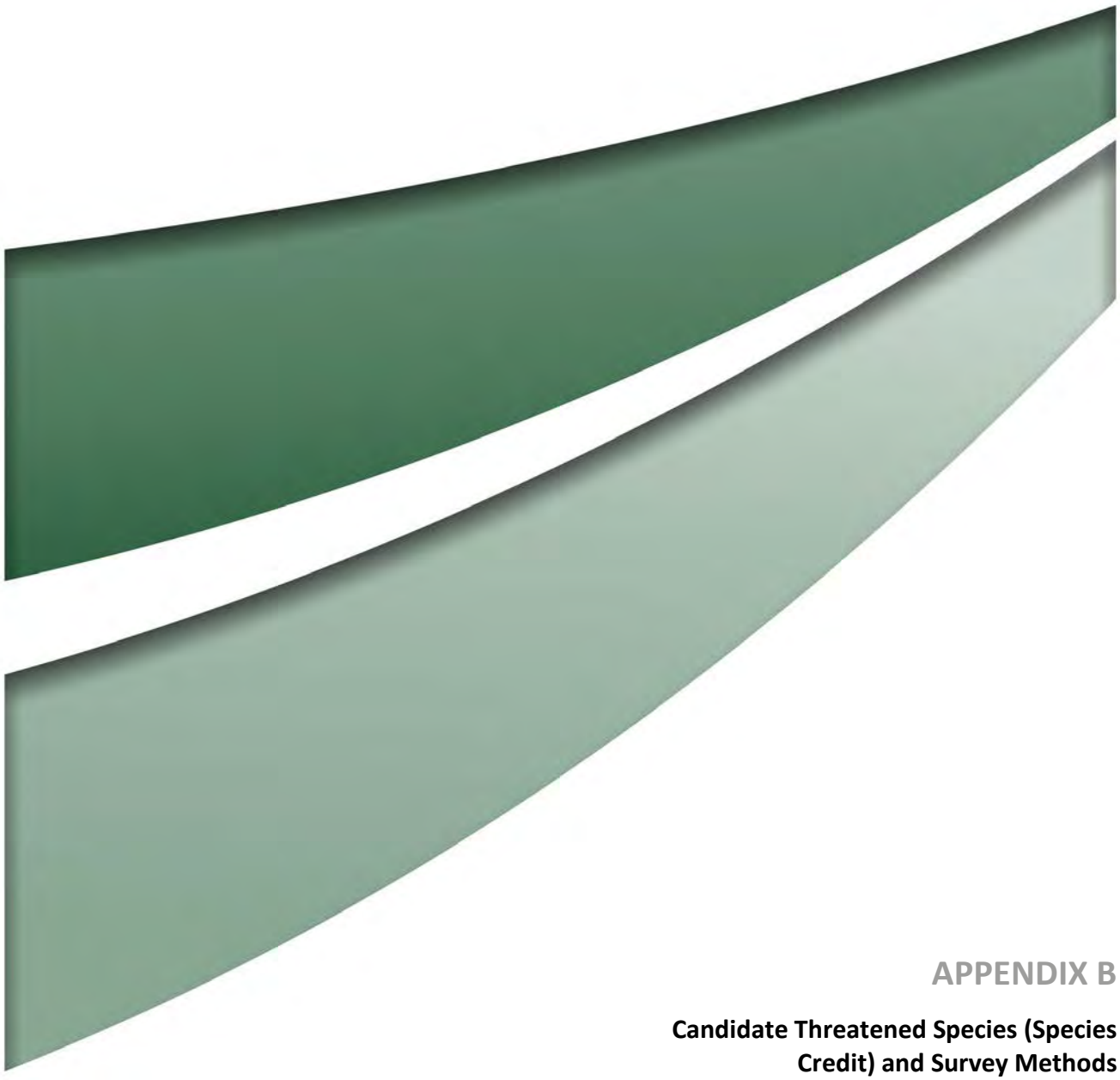
Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Powerful Owl (foraging) ***Ninox strenua***	V	-	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Blue-billed Duck ***Oxyura australis***	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Yellow-bellied Glider ***Petaurus australis***	V	-	High	Hollow bearing trees; Hollows > 25cm diameter	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Scarlet Robin ***Petroica boodang***	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
Flame Robin *Petroica phoenicea*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Koala (foraging) *Phascolarctos cinereus*	V	V	High	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Superb Parrot (foraging) *Polytelis swainsonii*	V	V	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Grey-crowned Babbler (eastern subspecies) *Pomatostomus temporalis*	V	-	Moderate	-	NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
Grey-headed Flying-fox (foraging) *Pteropus poliocephalus*	V	V	High	-	NSW South Western Slopes/Inland Slopes	351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	V	-	High	-	NSW South Western Slopes/Inland Slopes	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Greater Broad-nosed Bat *Scoteanax rueppellii*	V	-	High	-	South Eastern Highlands/Murrumbateman	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Diamond Firetail *Stagonopleura guttata*	V	-	Moderate	-	South Eastern Highlands/Murrumbateman NSW South Western Slopes/Inland Slopes	289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
						350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
						351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Masked Owl (foraging) *Tyto novaehollandiae*	V	-	High	-	NSW South Western Slopes/Inland Slopes	351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Rosenberg's Goanna *Varanus rosenbergi*	V	-	High	East of Holbrook area; eastern third of	South Eastern Highlands/Murrumbateman	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern

Species	BC Act	EPBC Act	Sensitivity to Gain	Habitat Constraint	IBRA Region/Subregion	Vegetation Zone Prediction
				subregion, south-east of a line that runs between Tarcutta and Galong	NSW South Western Slopes/Inland Slopes	Highland Bioregion
Australasian Bittern^ ***Botaurus poiciloptilus***	E	E	Moderate	-	-	Nil
Eastern Curlew^ ***Numenius madagascariensis***	-	CE	High	-	-	Nil
Australian Painted Snipe^ ***Rostratula australis***	E	E	Moderate	-	-	Nil
Corben's Long-eared Bat^ ***Nyctophilus corbeni***	V	V	High	-	-	Nil

^Predicted by literature review and therefore do not have a IBRA Region/Subregion or Vegetation Zone Prediction applicable to the BAM Calculator.



APPENDIX B

Candidate Threatened Species (Species Credit) and Survey Methods

Predicted Threatened Species (Species Credit) and Survey Methods

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
Flora Species							
Acacia meiantha ***Acacia meiantha***	E	E	Jul-Oct	NSW South Western Slopes - Inland Slopes		Yes	**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering Transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in September 2017, October 2017, July 2019, August 2019 and September 2019 (Umwelt) and a combination of meandering and targeted parallel searches were undertaken in October 2011, October 2014 (NGH Environmental 2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Yass Daisy ***Ammobium craspedioides***	V	V	Sep-Nov	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	West of Federal Highway; South of Cowra		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering and targeted parallel transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in September 2017, October 2017, December 2017, September 2019 and November 2019 (Umwelt); and a combination of meandering and targeted parallel searches were undertaken in October 2011, November 2011 and November 2013 (NGH Environmental 2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Crimson Spider Orchid ***Caladenia concolor***	E	V	Sep	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	West of Jingellic	Yes	**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Parallel transects were walked between 10 m apart across suitable habitat during survey periods across September and October 2017 (Umwelt); and October 2014, November 2013 and November 2011 (NGH Environmental 2014 and 2016). Meandering transects were also undertaken within potential habitat for the species across the Development Corridor and Indicative Development Footprint – External Roads in September 2017, November 2017 and September 2019, providing opportunistic observations. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Black Gum ***Eucalyptus aggregata***	V	V	All year	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	The far eastern sub-region (in ranges)		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering transects were undertaken in September, October and December 2017, January and March 2018, April, September, November and December 2019, January and February 2020 (Umwelt). Surveys completed by NGH Environmental included meandering transects in October and November 2011, November 2013 and June 2015 (2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Robertson's Peppermint ***Eucalyptus robertsonii* subsp. *hemisphaerica***	V	V	All year	NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering transects were undertaken in September, October and December 2017, January and March 2018, April, September, November and December 2019, January and February 2020 (Umwelt). Surveys completed by NGH Environmental included meandering transects in October and November 2011, November 2013 and June 2015 (2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
Tarengo Leek Orchid ***Prasophyllum petilum***	E	E	Sep-Dec	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	East of Binalong, south and east of Boorowa		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Parallel and meandering transects were undertaken in September, October and December 2017, while meandering transects were undertaken in September, November and December 2019, and January 2020 (Umwelt). Surveys completed by NGH Environmental included targeted and meandering transects in October and November 2011 and November 2013 (2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Small Purple-pea ***Swainsona recta***	E	E	Sep-Nov	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering Transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in September 2017, October 2017 and September, November and December 2019 (Umwelt). Meandering searches were undertaken in October and November 2011, and November 2013 (NGH). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Silky Swainson-pea ***Swainsona sericea***	V	-	Sep-Nov	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	The southern half of subregion		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering Transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in September 2017, October 2017 and September, November and December 2019 (Umwelt). Meandering searches were undertaken in October and November 2011, and November 2013 (NGH Environmental 2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Floating Swamp Wallaby-grass^ ***Amphibromus fluitans***	V	V	Dec-March	-	Semi-permanent/ephemeral wet areas		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Closest record is in Crookwell, NSW, approximately 50km north east of the Project. Meandering Transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in December 2017, January 2018, February 2018, November 2019, December 2019, January 2020 and February 2020 (Umwelt). Meandering searches were undertaken in November 2011, and November 2013 (NGH). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Button Wrinklewort^ ***Rutidosis leptorrhyncoides***	E	E	All year	-			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Closest record is Goulburn, NSW, approximately 70km east of the Project. Meandering transects were undertaken in September, October and December 2017, January and March 2018, April, September, November and December 2019, and January 2020 (Umwelt). Surveys completed by NGH included meandering transects in October and November 2011, November 2013 and June 2015. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
Austral Toadflax^ ***Thesium australe***	V	V	Nov-Feb	-			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Closest record is south of Canberra, NSW, approximately 80km south of the Project. Meandering Transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in December 2017, January 2018, February 2018, November 2019, December 2019, January 2020 and February 2020 (Umwelt). Meandering searches were undertaken in November 2011, and November 2013 (NGH). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Fauna Species							
Regent Honeyeater (Breeding) ***Anthochaera phrygia***	CE	CE	None provided	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes		Yes	**Not present (surveyed). No species records occur within 10km of the Indicative Development Footprints. The BAM Support Team confirmed on 20 February 2020 that the Indicative Development Footprints are not within an important area for this species.** Meandering transects were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in September, October and December 2017; January, February and March 2018; April, September, November and December 2019; and January 2020 (Umwelt). Bird surveys were undertaken in October 2017, January 2018, February 2018 and March 2018 (Umwelt). Bird surveys involved undertaking a short meandering transect over a period of 30 minutes while recording any bird species observed or heard during this period. Call playback for the regent honeyeater was undertaken in October 2017 (Umwelt). This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Bird Utilisation surveys were undertaken in February, March, October and November 2018, as well as in January and February 2019 (Umwelt). Bird Utilisation surveys were also undertaken in November 2013 (NGH Environmental 2014 and 2016). Bird utilisation and raptor vantage surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. This also involved recording the height that each bird was observed at. Opportunistic observations were made over all Umwelt survey periods. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Pink-tailed Legless Lizard ***Aprasia parapulchella***	V	V	Sep-Nov	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	West of Dalton; Rocky areas or within 50 metres of rocky areas		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Diurnal reptile searches were undertaken in September and October 2017 (Umwelt). These searches involved turning logs and rocks in suitable habitat for a period of 30 minutes. Meandering transects were undertaken in November 2019 and logs and rocks were opportunistically turned to search for reptiles (Umwelt). Active reptile searches, including rolling of logs, rocks and branches was undertaken across 11 searches in November 2011 by NGH (NGH Environmental 2014 and 2016). Tile grid arrays were also completed by NGH Environmental (2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).

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Bush Stone-curlew ***Burhinus grallarius***	E	-	All year	NSW South Western Slopes - Inland Slopes	Fallen/standing dead timber including logs		**Not present (surveyed). No species records occur within 10km of the Indicative Development Footprints.** Meandering transects were undertaken across numerous survey periods in September, October and December 2017; January, February, and March 2018; April, September, November and December 2019; and January 2020 (Umwelt). Spotlighting transects and nocturnal surveys were undertaken in October 2017, January 2018, February and March 2018 (Umwelt). Suitable fallen logs were inspected. Bird utilisation surveys were undertaken in October and November 2018; and January and February 2019 (Umwelt). Spotlighting and nocturnal surveys were also undertaken in November 2013 (NGH Environmental 2014). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Gang-gang Cockatoo (Breeding) ***Callocephalon fimbriatum***	V	V	Oct-Jan	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** Records occur within 10km of the Indicative Development Footprints, however no individuals were observed across extensive survey periods. Meandering transects for opportunistic sightings were undertaken in October and December 2017; January 2018; November and December 2019; and January 2020 (Umwelt). General bird surveys were undertaken in October 2017 and January 2018 (Umwelt). Bird surveys involved a undertaking a short meandering transect over a period of 30 minutes while recording any bird species observed or heard during this period. Bird utilisation surveys were undertaken in October 2018, November 2018, January 2019 and February 2019 (Umwelt). Bird utilisation surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. General bird surveys and bird utilisation surveys were also undertaken in November 2013 (NGH Environmental 2014). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Eastern Pygmy-possum ***Cercartetus nanus***	V	-	Oct-Mar	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Spotlighting and nocturnal surveys were undertaken in October 2017, January 2018, February 2018 and March 2018. Spotlighting involved walking meandering transects in suitable habitat between sunset and midnight with a high powered headtorch to search for nocturnal animals. Spotlighting transects were surveyed over a period of 30 minutes or more per site. Remote cameras were installed across the Development Corridor and Indicative Development Footprint – External Roads in February and March 2018, April and November 2019. Bushnell Trophy Cam HD cameras were installed 1 metre above the ground pointing at a bait station containing honey, peanut butter and tuna. Cameras were set to take three photos in quick succession when movement was detected. Opportunistic observations were completed across all Umwelt survey periods. Cage-trapping surveys were also completed in April 2012 as well as spotlighting surveys in November 2011, April 2012 and November 2013 by NGH Environmental (NGH Environmental 2014 and 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Large-eared Pied Bat ***Chalinolobus dwyeri***	V	V	Nov-Jan	NSW South Western Slopes - Inland Slopes		Yes	**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Echolocation surveys were conducted over 52 nights across the Development Corridor and Indicative Development Footprint – External Roads using a number of Titley Scientific Anabat Express detectors. Survey periods included November 2018; January and February 2019; March and April 2019; and January 2020. At each site, the Anabat was positioned one metre above the ground and positioned towards potential micro-bat flyaways along areas of

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
							suitable habitat. The Anabat detector was programmed to start recording from one hour before sunset to one hour after sunrise. Opportunistic observations were made during all nocturnal and spotlighting surveys (Umwelt). Spotlighting and nocturnal surveys conducted in November 2013 also targeted this species (NGH). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Striped Legless Lizard ***Delma impar***	V	V	Sep-Dec	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Present (previously recorded).** This species was previously recorded by NGH Environmental. A single record was made at one location to the north of the Development Site. Derived Native Grassland is considered to be suitable habitat for the species only in close proximity to the record. Diurnal reptile searches were undertaken in September and October 2017 (Umwelt). These searches involved turning logs and rocks in suitable habitats or a period of 30 minutes. Meandering transects were undertaken in November and December 2019 and logs and rocks were opportunistically turned to search for reptiles (Umwelt). Active reptile searches, including rolling of logs, rocks and branches was undertaken across 11 searches in November 2011 by NGH (NGH Environmental 2014). Tile grids were installed by NGH in July 2013 and monitored in November and December 2013 for presence of striped legless lizard, and 24 targeted funnel trap surveys were monitored over four nights in November 2013. Habitat assessments were undertaken for this species in March 2014 (NGH Environmental 2014 and 2016).
White-bellied Sea-Eagle (Breeding) ***Haliaeetus leucogaster***	V	-	Jul-Dec	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. A combination of meandering transects and opportunistic observations were made in September, October and December 2017, September, October and December 2019 and January 2010 to determine the presence of large stick nests (Umwelt). Bird Utilisation and Raptor Vantage surveys were undertaken in October and November 2018 and July 2019 (Umwelt). Bird surveys and Bird Utilisation surveys were also undertaken in November 2013 (NGH). Bird utilisation and raptor vantage surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. This also involved recording the height at which each bird was observed. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Little Eagle (Breeding) ***Hieraaetus morphnoides***	V	-	Aug-Oct	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Habitat assessments were undertaken to determine whether suitable habitat for this species was present in September and October 2017. Opportunistic observations were undertaken across all Umwelt survey periods. Bird Utilisation and Raptor Vantage surveys were undertaken in October and November 2018 and July 2019 (Umwelt). Bird surveys and Bird Utilisation surveys were also undertaken in November 2013 (NGH). Bird utilisation and raptor vantage surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. This also involved recording the height that each bird was observed at. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Swift Parrot (Breeding) ***Lathamus discolor***	E	CE	None provided	NSW South Western Slopes - Inland Slopes		Yes	**Not present (surveyed). The BAM Support Team confirmed on 20 February 2020 that the** Indicative **Development Footprints are not within an important area for this species.** No species records occur within 10km of the Indicative Development Footprints. Meandering transects for opportunistic sightings were undertaken in September,

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							October and December 2017; January, February and March 2018; April, September, November and December 2019; and January 2020 (Umwelt). Bird utilisation surveys were undertaken in October 2018, November 2018, January 2019 and February 2019 (Umwelt). Bird utilisation surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. Call playback and bird surveys were undertaken in October 2017 (Umwelt). Bird surveys involved a undertaking a short meandering transect over a period of 30 minutes while recording any bird species observed or heard during this period. Call playback involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Point count (bird census) surveys were also undertaken by NGH in July 2013, targeting this species. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Green and Golden Bell Frog ***Litoria aurea***	E	V	Nov-Mar	South Eastern Highlands - Murrumbateman	Semi-permanent/ephemeral wet areas; within 1 kilometre of wet areas, swamps or waterbody		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Diurnal amphibian searches were undertaken in January, February and March 2018. This involved active searches within suitable habitats. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in January, February and March 2018; December 2019; and January 2020. Call playback for this species was undertaken in February and March 2018; December 2019; and January 2020. This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Booroolong Frog ***Litoria booroolongensis***	E	E	Nov-Dec	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Diurnal amphibian searches were undertaken in October 2017; and January, February and March 2018. This involved active searches within suitable habitats. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in October 2017; January, February and March 2018; December 2019; and January 2020. Call playback for this species was undertaken in October 2017; January February and March 2018; December 2019; and January 2020. This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Yellow-spotted Tree Frog ***Litoria castanea***	CE	E	Nov-Dec	South Eastern Highlands - Murrumbateman		Yes	**Not present (surveyed).** Records occur within 10km of the Indicative Development Footprints, however no individuals were observed across any Umwelt survey periods. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in December 2019 and January 2020. Call playback for this species was undertaken in December 2019 and January 2020. This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).

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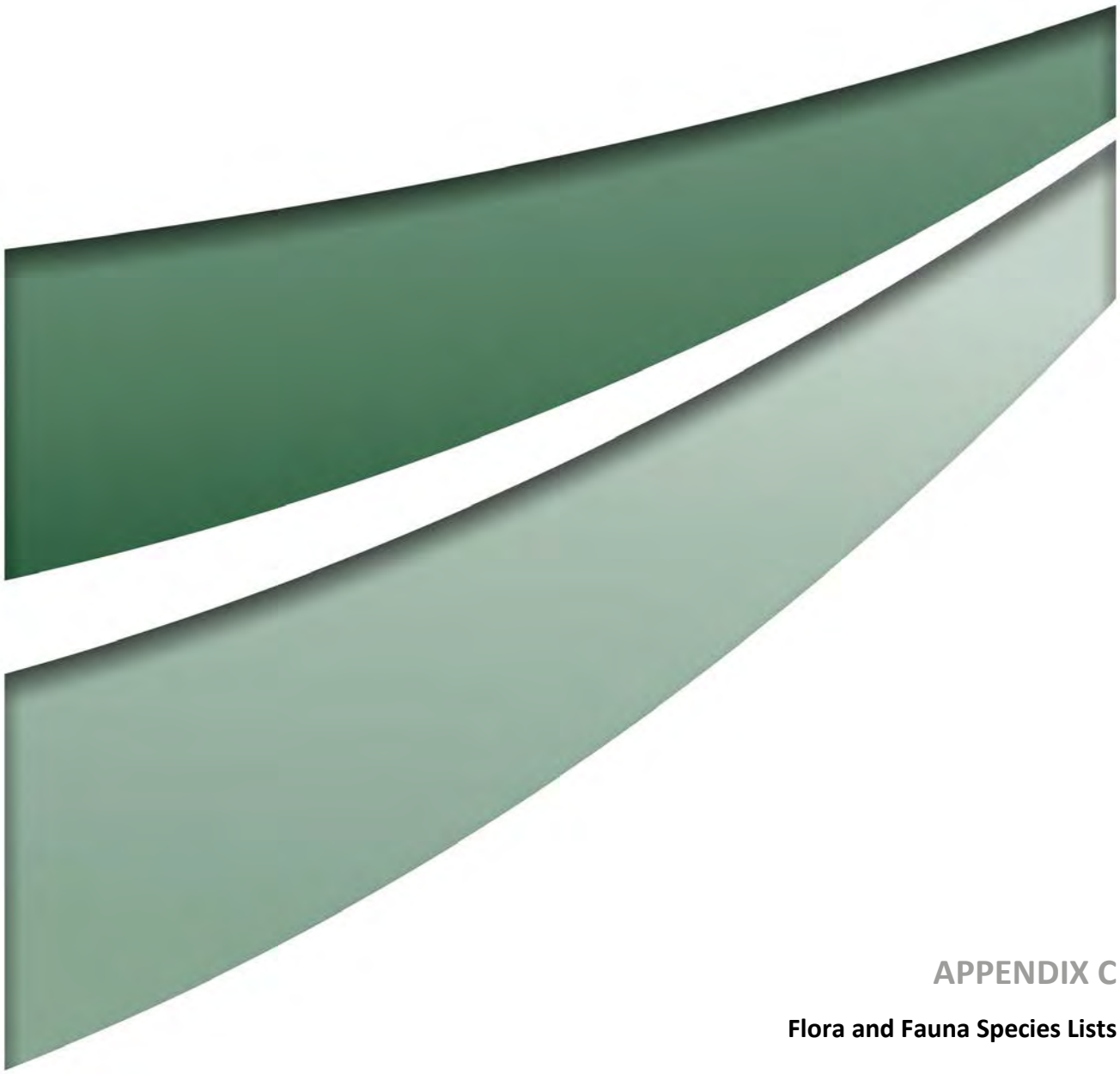
Southern Bell Frog ***Litoria raniformis***	E	V	Oct-Jan	NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Diurnal amphibian searches were undertaken in October 2017; and January, February and March 2018. This involved active searches within suitable habitats. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in October 2017; January, February and March 2018; December 2019; and January 2020. Call playback for this species was undertaken in October 2017; February and March 2018; December 2019; and January 2020. This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Square-tailed Kite (Breeding) ***Lophoictinia isura***	V	-	Sep-Jan	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. A combination of meandering transects and opportunistic observations were made in September, October and December 2017; January 2018; September, October and December 2019; and January 2010 to determine the presence of large stick nests (Umwelt). Bird Utilisation and Raptor Vantage surveys were undertaken in October and November 2018; and January, February and July 2019 (Umwelt). Bird surveys and Bird Utilisation surveys were also undertaken in November 2013 (NGH). Bird utilisation and raptor vantage surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. This also involved recording the height that each bird was observed at. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Large Bent-winged Bat (Breeding) ***Miniopterus orianae oceanensis***	V	-	Dec-Feb	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes		Yes	**Species recorded within the** Indicative **Development Footprints, but no breeding habitat is present (surveyed).** Echolocation surveys were conducted over 52 nights across the Indicative Development Footprints using a number of Titley Scientific Anabat Express detectors. Survey periods included November 2018; January and February 2019; March and April 2019; and January 2020. At each site, the Anabat was positioned one metre above the and positioned towards potential micro-bat flyaways along areas of suitable habitat. The Anabat detector was programmed to start recording from one hour before sunset to one hour after sunrise. Opportunistic observations were made during all nocturnal and spotlighting surveys (Umwelt). Spotlighting and nocturnal surveys conducted in November 2013 also targeted this species (NGH).
Southern Myotis ***Myotis macropus***	CE	E	Oct-Mar	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Assumed present (surveyed).** Breeding habitat for this species was calculated within the Indicative Development Footprints. All woodland and forest habitat in the Indicative Development Footprints within 200m of a suitably sized waterway is considered to be suitable habitat for the species. In relation to the Indicative Development Footprints, only patches of remnant vegetation within 200 metres of Pudman Creek at Grassy Creek Road supports habitat for this species. Echolocation surveys were conducted over 52 nights across the Indicative Development Footprints using a number of Titley Scientific Anabat Express detectors. Survey periods included November 2018; January and February 2019; March and April 2019; and January 2020. At each site, the Anabat was positioned one metre above the and positioned towards potential micro-bat flyaways along areas of suitable habitat. The Anabat detector was programmed to start recording from one hour before sunset to one hour after sunrise. Opportunistic observations were made during all nocturnal and spotlighting surveys (Umwelt). Spotlighting and nocturnal surveys conducted in November 2013 also targeted this species

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
							(NGH). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Barking Owl (Breeding) ***Ninox connivens***	V	-	May-Dec	NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Hollow bearing tree assessments were undertaken in September 2017 (Umwelt); October and November 2011 (NGH); April 2012 (NGH); November 2013 (NGH); and June 2015 (NGH) (NGH Environmental 2014). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in September 2017; November 2018; February, April, July and August 2019 (Umwelt). Spotlighting searches were also undertaken in October and November 2011; April 2012; and November 2013 (NGH). Call playback for this species was undertaken in November 2018; and February, April, July and August 2019 (Umwelt). Call playback was also undertaken in October and November 2011; April 2012; and November 2013 (NGH Environmental). This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Stag watches, which involved watching hollow-bearing trees following the period immediately after sunset for forest owl activity, was undertaken in October and November 2011; and in April 2012. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Powerful Owl (Breeding) ***Ninox strenua***	V	-	May-Aug	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Hollow bearing tree assessments were undertaken in October and November 2011; April 2012; November 2013; and June 2015 (NGH). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in November 2018; February, April, July and August 2019 (Umwelt). Spotlighting searches were also undertaken in October and November 2011; April 2012; and November 2013 (NGH). Call playback for this species was undertaken in November 2018; and February, April, July and August 2019 (Umwelt). Call playback was also undertaken in October and November 2011; April 2012; and November 2013 (NGH). This involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Stag watches, which involved watching hollow-bearing trees following the period immediately after sunset for forest owl activity, was undertaken in October and November 2011; and in April 2012. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Squirrel Glider ***Petaurus norfolcensis***	V	-	All year	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Present (surveyed). This species was recorded at multiple locations within and adjacent to the Indicative Development Footprints. Suitable woodland and forest in the Indicative Development Footprints in proximity to the species records is considered suitable habitat for this species.** Cage-trapping surveys were also completed in April 2012 as well as spotlighting surveys in November 2011, April 2012 and November 2013 by NGH Environmental (NGH Environmental 2014 and 2016). These surveys did not record the species.
Brush-tailed Rock-wallaby ***Petrogale pencillata***	E	V	All year	NSW South Western Slopes - Inland Slopes	Rocky outcrops/cliffs	Yes	**Not present (surveyed).** No records occur within 10km of the Indicative Development Footprints and no suitable habitat occurs within the Indicative Development Footprints. Meandering transects were undertaken in September, October and December 2017; and January, February and March 2018 (Umwelt).

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
							Fauna habitat assessments were taken across the Indicative Development Footprints in February and March 2018 to catalogue any suitable habitat for this species (Umwelt). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. Spotlighting was undertaken across three survey periods in October 2017; January 2018; and February and March 2018. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Brush-tailed Phascogale ***Phascogale tapoatafa***	V	-	All year	NSW South Western Slopes - Inland Slopes	Hollow bearing trees		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Fauna habitat assessments were taken across the Development Corridor and Indicative Development Footprint – External Roads in February and March 2018 to catalogue any suitable habitat for this species (Umwelt). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. Spotlighting was undertaken across three survey periods in October 2017; January 2018; and February and March 2018 (Umwelt). Remote cameras were installed within the Development Corridor and Indicative Development Footprint – External Roads to target brush-tailed phascogales in April 2019 (Umwelt). Bushnell Trophy Cam HD cameras were installed 1 metre above the ground pointing at a bait station containing honey, peanut butter and tuna. Cameras were set to take three photos in quick succession when movement was detected. Opportunistic observations were completed across all Umwelt survey periods. NGH Environmental completed cage-trapping and nocturnal surveys, comprising 8 traps over four nights and 8 traps over three nights at two sites in April 2012. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Koala (Breeding) ***Phascolarctos cinereus***	V	V	All year	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** Historical records occur within 10km (1970, 1980 and 1997) of the Indicative Development Footprints however no individuals were identified across extensive survey periods. Meandering transects searching for suitable habitat or opportunistic sightings were undertaken in September, October and December 2017; January, February and March 2018; and April 2019 (Umwelt). Spotlighting and call playback were undertaken in October 2017; January 2018; and February and March 2018 (Umwelt). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. Call playback involved a period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Remote cameras were installed within the Development Corridor and Indicative Development Footprint – External Roads to target the koala in February and March 2018 (Umwelt). Bushnell Trophy Cam HD cameras were installed 1 metre above the ground pointing at a bait station containing honey, peanut butter and tuna. Cameras were set to take three photos in quick succession when movement was detected. Targeted scat searches were undertaken across the Development Corridor and Indicative Development Footprint – External Roads in accordance with the Spot Assessment Technique (SAT). Koala SAT searches had a focus on feed tree species (where applicable) and were undertaken in October 2017 (Umwelt) and November 2013 (NGH). Opportunistic observations were made across all Umwelt survey periods. Umwelt have considered the Draft Koala Habitat Protection Guideline (DPIE 2020). In the absence of current records of the species within the Development Corridor, but as PCTs 289, 350 and 351 generally support 15 per cent of regionally relevant eucalypt species for the koala, much of the habitat in the Development Corridor is

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
							likely to be deemed 'Highly Suitable Koala Habitat' (DPIE 2020). Further commentary and consideration of these guidelines and the SEPP is required within the Modification Document. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Superb Parrot (Breeding) ***Polytelis swainsonii***	V	V	Sep-Nov	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes			**Present (surveyed).** This species was recorded at several locations within the Indicative Development Footprints by both Umwelt and NGH Environmental (2014 and 2016). All PCT350 woodland and Derived Native Grasslands that support mature trees with hollows within the Development Corridor and Indicative Development Footprint – External Roads is considered suitable habitat. Bird surveys involved a undertaking a short meandering transect over a period of 30 minutes while recording any bird species observed or heard during this period. Hollow-bearing tree surveys and habitat mapping for this species occurred in September and December 2017 (Umwelt); October and November 2011 (NGH); April and November 2012 (NGH), November 2013 (NGH) and June 2015 (NGH). Bird utilisation surveys and Targeted Superb Parrot surveys were completed in October and November 2018 (Umwelt); January, February, April and July 2019 (Umwelt); and November 2013 (NGH). Bird utilisation surveys involved a visual assessment of the species and habit (e.g. feeding, perching, flying) of all observed bird species from a high vantage point in the landscape. Targeted surveys for superb parrot assessed flight paths and local use of the site during the breeding season. This involved walking transects in superb parrot habitat and mapping flight paths taken by sighted individuals.
Grey-headed Flying-fox (Breeding) ***Pteropus poliocephalus***	V	V	Oct-Dec	NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Meandering transects to search for potential roosts or habitat were undertaken for the species during October and December 2017 (Umwelt). Spotlighting for this species was completed in December 2017. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. Opportunistic observations were made during all Umwelt survey periods. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Golden Sun Moth ***Synemon plana***	E	CE	Oct-Dec	South Eastern Highlands - Murrumbateman NSW South Western Slopes - Inland Slopes	A radius of 15 kilometres west of Binalong and eastwards to the subregion's eastern-most boundary; and in a radius of 15 kilometres from Tumut	Yes	**Present (surveyed).** This species was recorded at several locations within the Indicative Development Footprints by both Umwelt and NGH Environmental (2014 and 2016). All Derived Native Grasslands in PCT350 and PCT351 in proximity to the records are considered suitable habitat for the species. Meandering transects to search for potential individuals or habitat were undertaken for the species during October and December 2017; and November and December 2019 (Umwelt). Targeted Golden sun moth transects, walked approximately 10 metres apart in suitable habitat, were undertaken in December 2017 (Umwelt); October and November 2011 (NGH); November 2012 (NGH); and November and December 2013 (NGH). Golden sun moth meandering transects (i.e. not strict parallel transects) were completed in November 2018 (Umwelt) and golden sun moth habitat mapping completed in March 2014 (NGH). Opportunistic observations were made throughout all Umwelt survey periods.
Masked Owl (Breeding) ***Tyto novaehollandiae***	V	-	May-Aug	NSW South Western Slopes - Inland Slopes			**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. These surveys occurred in February, April, July and August 2019 (Umwelt). Call playback for this species was concurrently undertaken in February, April, July and August 2019 (Umwelt). This involved a

Species	BC Act	EPBC Act	Survey Period	IBRA Region/Subregion	Habitat Constraint / Geographic Constraint	SAII Entity	Survey Method and Justification
							period of quiet listening for five minutes, followed by playing the animal's calls over a 15 watt directional loud hailer for five minutes, followed by a ten-minute quiet listening period. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016). Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).
Greater Glider^ *Petauroides volans*	-	V	All year	-	Hollow bearing trees		**Not present (surveyed).** No species records occur within 10km of the Indicative Development Footprints. Closest record is Binda, NSW, approximately 50km north east of the Project. Fauna habitat assessments were taken across the Development Corridor and Indicative Development Footprint – External Roads in February and March 2018 to catalogue any suitable habitat for this species (Umwelt). Nocturnal spotlighting searches were undertaken in suitable habitat areas between sunset and midnight using 30 watt Lightforce hand-held spotlights and head torches. Spotlighting was undertaken across three survey periods in October 2017; January 2018; and February and March 2018 (Umwelt). Remote cameras were installed within the Development Corridor and Indicative Development Footprint – External Roads to target brush-tailed phascogales in April 2019 (Umwelt). Bushnell Trophy Cam HD cameras were installed 1 metre above the ground pointing at a bait station containing honey, peanut butter and tuna. Cameras were set to take three photos in quick succession when movement was detected. Opportunistic observations were completed across all Umwelt survey periods. NGH Environmental completed spotlighting transects. Impacts were not calculated for this species as part of the original approval for the Project (NGH Environmental 2016).



APPENDIX C

Flora and Fauna Species Lists

Flora Species List

The following list was developed from the floristic plot rapid transect surveys of the Development Corridor. It includes all species of vascular plants observed during these surveys.

Names of classes and families follow a modified Cronquist (1981) System.

Any species that could not be identified to the lowest taxonomic level are denoted in the following manner:

sp.	specimens that are identified to genus level only.

The following abbreviations or symbols are used in the list:

AA	denotes abundance rating according to BAM
PC	cover measure according to BAM
asterisk (*)	denotes species non-native species
double asterisk (**)	denotes High Threat Weed species under the BAM
subsp.	subspecies and
var.	variety.

All vascular plants recorded or collected were identified using keys and nomenclature in Harden (1992, 1993, 2000 and 2002). Where known, changes to nomenclature and classification have been incorporated into the results, as derived from PlantNET (Botanic Gardens Trust 2020), the on-line plant name database maintained by the National Herbarium of New South Wales.

Common names used follow Harden (1992, 1993, 2000 and 2002) where available, and draw on other sources such as local names where these references do not provide a common name.

Table C1 Vegetation Zones 1 to 5

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG														VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Filicopsida																																															
Adiantaceae	*Cheilanthes sieberi*	rock fern																											100	1																	
Magnoliopsida – Liliidae (Monocots)																																															
Anthericaceae	*Thysanotus patersonii*	twining fringe-lily									4																																			
Cyperaceae	*Carex appressa*	tall sedge			100	30	500	50	50	3							20	4			30	0.5																									
Cyperaceae	*Carex* sp.						3	0.4																																							
Cyperaceae	**Cyperus eragrostis*	umbrella sedge																			20	0.1																									
Cyperaceae	*Lepidosperma laterale*	variable sword-sedge																																							100	0.5					
Cyperaceae	*Schoenoplectus validus*								20	0.1																																				
Cyperaceae	*Schoenus apogon*	fluke bogrush																			100	0.4							100	0.1																
Iridaceae	*Patersonia sericea*	silky purple-flag																																							100	1					
Iridaceae	***Romulea rosea* var. *australis*																												1000	3																
Juncaceae	*Juncus australis*	rush																			5	0.1																									
Juncaceae	*Juncus filicaulis*										10	4			2	0.1																													
Juncaceae	*Juncus* sp.	a rush			20	10	100	25	30	0.1											40	0.3			20	1			20	0.2					2	0.4									
Juncaceae	*Juncus usitatus*																10	2	50	2							5	0.7																	
Juncaceae	*Luzula densiflora*	woodrush									50	10																																			
Liliaceae	*Liliaceae indeterminate*	lilies																			10	0.1																									
Lomandraceae	*Lomandra filiformis*	wattle matt-rush																					50	1					20	0.7											200	0.1					
Lomandraceae	*Lomandra filiformis* subsp. *coriacea*	wattle matt-rush	50	10	10	0.4					20	10	50	4			100	15	10	0.7									50	0.1					100	5	100	3					20	1	100	5	120	2
Lomandraceae	*Lomandra filiformis* subsp. *filiformis*																																		20	0.8	2	0.4	50	5							
Lomandraceae	*Lomandra longifolia*	spiny-headed mat-rush																			50	1.5																									
Lomandraceae	*Lomandra multiflora*	many-flowered mat-																									2	0.4			10	1													

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG														VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
	subsp. *multiflora*	rush																																													
Orchidaceae	*Eriochilus cucullatus*	parson's bands																									15	0.1																				
Orchidaceae	*Microtis* sp.										5	0.1																																				
Phormiaceae	*Dianella revoluta*	blueberry lily																																	50	4			20	3	100	1						
Poaceae	**Aira caryophyllea*	silvery hairgrass																							5	0.4																						
Poaceae	**Aira cupaniana*	silvery hairgrass									10	0.1																	20	0.01																		
Poaceae	*Aristida ramosa*	purple wiregrass	50	10							10	5			1	0.1	50	5	50	0.1							50	1	20	1			20	3	20	3							50	10	50	1
Poaceae	*Aristida vagans*	threeawn speargrass											10	2																																
Poaceae	**Arrhenatherum elatius*	oatgrass							1000	50																																				
Poaceae	*Austrodanthonia caespitosa*	ringed wallaby grass	30	2																																										
Poaceae	*Austrodanthonia carphoides*	short wallaby grass											50	2											1000	15									20	1	20	1					5	0.4		
Poaceae	*Austrodanthonia eriantha*	wallaby grass																					20	1																						
Poaceae	*Austrodanthonia fulva*	wallaby grass			10	0.4																																							
Poaceae	*Austrodanthonia monticola*	mountain wallaby grass															100	10							50	3																	500	2		
Poaceae	*Austrodanthonia racemosa*	wallaby grass																													50	0.1									500	10				
Poaceae	*Austrodanthonia setacea*	small-flowered wallaby-grass																									10	0.5																		
Poaceae	*Austrostipa scabra*	speargrass																											6	0.1	5	0.1									100	10				
Poaceae	*Austrostipa scabra* subsp. *falcata*	rough speargrass			10	0.4							4	0.5			50	10							500	15	100	3							20	1					300	1				
Poaceae	**Avena fatua*	wild oats			20	0.8																					20	1			30	1														
Poaceae	*Bothriochloa macra*	red grass							5	0.1							5	0.4							50	2			100	0.5																
Poaceae	**Briza maxima*	quaking grass	5	0.01																			50	1							5	0.01														
Poaceae	**Briza minor*	shivery grass							50	0.1																					5	0.01														
Poaceae	**Bromus catharticus*	prairie grass			100	30																																								
Poaceae	***Bromus diandrus*	great brome													500	5							20	1																						
Poaceae	**Bromus hordeaceus*	soft brome							200	0.5					100	2									20	1							100	0.1												

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG												VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG											
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Poaceae	**Bromus molliformis*	soft brome																							100	2																	100	5				
Poaceae	**Bromus rubens*	red brome																													10	0.01											1000	25				
Poaceae	*Chloris truncata*	windmill grass															20	5																														
Poaceae	*Cynodon dactylon*	common couch			100	5	100	15									50	5			20	0.2			20	2																			10	1		
Poaceae	**Cynosurus echinatus*	rough dog's tail							50	0.5																																				
Poaceae	**Dactylis glomerata*	cocksfoot							100	1																	10	0.8			8	0.01														
Poaceae	*Dichanthium sericeum*	Queensland bluegrass																							100	5																				
Poaceae	*Elymus scaber*	common wheatgrass							20	0.1							10	0.4							50	2	10	0.4					1000	5												
Poaceae	*Enneapogon nigricans*	niggerheads																															20	0.1												
Poaceae	**Holcus lanatus*	Yorkshire fog																					5	1																						
Poaceae	**Hordeum leporinum*	barley grass													1	0.1																														
Poaceae	**Hordeum marinum*	sea barley grass															100	3									500	5																		
Poaceae	**Hordeum* sp.	a barley grass									2	0.1																																		
Poaceae	*Joycea pallida*	silvertop wallaby grass	50	10							3	3					3	0.4																	100	20	20	3	100	30	3000	25	1	0.1	20	10		
Poaceae	**Lolium perenne*	perennial ryegrass	3	0.01											100	2																											100	5				
Poaceae	**Lolium rigidum*	Wimmera ryegrass																					500	5																						
Poaceae	*Microlaena stipoides*	weeping grass													20	0.5					1000	2							50	0.5													100	5				
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass									500	15							1000	6					100	3																			50	1
Poaceae	***Nassella trichotoma*	serrated tussock					5	0.4																																						
Poaceae	*Panicum effusum*	hairy panic	20	1													50	20	20	0.5					20	1	20	1																	2	0.1
Poaceae	*Panicum* sp.	panicum																													10	0.1												
Poaceae	***Paspalum dilatatum*	paspalum																							5	0.4	50	5																		
Poaceae	**Pennisetum setaceum*	fountain grass							50	1																																				
Poaceae	**Phalaris aquatica*	phalaris			50	5	50	1	50	0.5																	50	5			50	2														
Poaceae	*Poa*	tussock grass			10	2			1000	8							20	5																										

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG														VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
	labillardierei var. *labillardierei*																																													
Poaceae	*Poa sieberiana*	snowgrass											2	0.5							40	0.2																	50	10					100	5		
Poaceae	*Poa sieberiana* var. *cyanophylla*																																						300	1							
Poaceae	*Rytidosperma* sp.										500	30			500	10			100	3	500	0.5					400	5	50	2	100	0.2									10	0.2			50	1
Poaceae	*Themeda australis*	kangaroo grass			2	0.4					20	2							5	0.2							1000	65	8000	65	1000	40														
Poaceae	**Vulpia bromoides*	squirrel tail fesque					100	0.4							100	5	1000	3							500	1	500	3																		
Poaceae	**Vulpia myuros*	rat's tail fescue							1000	2			100	2									1000	1							1000	5														
Poaceae	**Vulpia* sp.	rat's-tail fescue									5	0.1																																		
Typhaceae	*Typha domingensis*	narrow-leaved cumbungi							100	5																																		
Magnoliopsida – Magnoliidae (Dicots)																																														
Acanthaceae	*Brunoniella australis*	blue trumpet																																			3	0.4									
Amaranthaceae	*Gomphrena* sp.																								20	1																				
Apiaceae	*Eryngium ovinum*	blue devil																											8	0.1															
Apiaceae	*Hydrocotyle laxiflora*	stinking pennywort									100	4									100	0.1																							
Asteraceae	**Arctotheca calendula*	capeweed																							50	1																			
Asteraceae	***Carthamus lanatus*	saffron thistle															10	0.4												10	0.01														
Asteraceae	*Cassinia aculeata*	dolly bush	1	0.01																																								
Asteraceae	*Cassinia arcuata*	sifton bush	100	15																																			80	1				
Asteraceae	*Cassinia quinquefaria*	Bill's beard																																					1	5				
Asteraceae	*Chrysocephalum apiculatum*	common everlasting																												4	0.5												
Asteraceae	**Cirsium vulgare*	spear thistle			20	1	20	1									50	5																										
Asteraceae	**Conyza bonariensis*	flaxleaf fleabane																												7	0.1												
Asteraceae	*Euchiton* sp.	a cudweed									2	0.1									50	0.1							20	0.1														
Asteraceae	**Hypochaeris glabra*	smooth catsear																			50	0.1	1	1					100	0.1	3	0.01												

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG														VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Asteraceae	*Hypochaeris radicata*	catsear			20	0.8			200	0.5	100	7			1	0.1			100	1					50	5	10	0.6			4	0.01	20	0.1									10	0.2				
Asteraceae	*Senecio tenuiflorus*	a fireweed																																									1	0.4		
Asteraceae	*Solenogyne dominii*																		3	0.1									300	0.2																
Asteraceae	*Sonchus oleraceus	common sowthistle			10	0.8																																								
Asteraceae	*Triptilodiscus pygmaeus*	common sunray									5	0.5																																		
Boraginaceae	*Echium plantagineum*	Paterson's curse																													20	0.1														
Campanulaceae	*Wahlenbergia* sp.	bluebell									1	0.1																																		
Campanulaceae	*Wahlenbergia stricta*	tall bluebell											3	0.4																													5	0.4		
Caryophyllaceae	*Petrorhagia nanteuilii*	proliferous pink																									10	0.4																		
Caryophyllaceae	*Petrorhagia* sp.										2	0.1																																		
Chenopodiaceae	*Einadia hastata*	berry saltbush																							10	0.4																				
Clusiaceae	*Hypericum gramineum*	small st john's wort									5	0.5																	100	0.1													20	0.5		
Clusiaceae	*Hypericum japonicum*																				20	0.1																								
Convolvulaceae	*Convolvulus angustissimus*																														1	0.01														
Convolvulaceae	*Convolvulus erubescens*	pink bindweed																											20	0.1																
Convolvulaceae	*Dichondra repens*	kidney weed																			20	0.1							20	0.1																
Dilleniaceae	*Hibbertia obtusifolia*	hoary guinea flower									50	10																	8	0.2					10	0.4	20	5	20	2			20	2	3	0.1
Dilleniaceae	*Hibbertia* sp.																																									10	1		
Ericaceae	*Brachyloma daphnoides*	daphne heath																																	100	4	50	15								
Ericaceae	*Leucopogon fletcheri*																																						50	2						
Ericaceae	*Leucopogon virgatus*																																		10	0.5										
Ericaceae	*Melichrus urceolatus*	urn heath									30	7																							100	5					50	2			20	5	7	0.6
Ericaceae	*Monotoca scoparia*																																		5	0.5			20	3						
Fabaceae (Faboideae)	*Daviesia genistifolia*	broom bitter pea	2	0.02																																										

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG												VZ4 – PCT350 – DNG										VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Fabaceae (Faboideae)	*Daviesia leptophylla*																																5	0.4	1	0.4			5	0.1						
Fabaceae (Faboideae)	*Daviesia ulicifolia*	gorse bitter pea											3	1																																
Fabaceae (Faboideae)	*Desmodium varians*	slender tick-trefoil																											40	0.1	7	0.01														
Fabaceae (Faboideae)	*Dillwynia phylicoides*	parrot-pea																																									20	4		
Fabaceae (Faboideae)	*Dillwynia sericea*	egg and bacon peas; parrot peas									15	5																																		
Fabaceae (Faboideae)	*Glycine tabacina*	variable glycine																					20	1							1	0.01														
Fabaceae (Faboideae)	*Hardenbergia violacea*	false sarsaparilla	7	0.5																															20	2	1	0.4					10	5		
Fabaceae (Faboideae)	*Hovea heterophylla*		1	0.01																													20	0.8	20	1	5	0.4			20	1		
Fabaceae (Faboideae)	*Indigofera australis*	Australian indigo									6	3																																
Fabaceae (Faboideae)	*Platylobium formosum* subsp. *formosum*																																				20	1						
Fabaceae (Faboideae)	*Pultenaea* sp.		10	1																																								
Fabaceae (Faboideae)	*Pultenaea villosa*	hairy bush-pea																																							100	0.1				
Fabaceae (Faboideae)	**Trifolium arvense*	haresfoot clover																							5	0.4					80	0.1														
Fabaceae (Faboideae)	**Trifolium subterraneum*	subterranean clover																	7	0.1					20	1																				
Fabaceae (Mimosoideae)	*Acacia dealbata*	silver wattle									6	5			1	0.1													2	0.1					2	0.5	1	0.4	2	0.4						
Fabaceae (Mimosoideae)	*Acacia deanei*	green wattle																																							5	1				
Fabaceae (Mimosoideae)	*Acacia genistifolia*	early wattle	20	5																																									
Fabaceae (Mimosoideae)	*Acacia gunnii*	ploughshare wattle																											15	0.2					1	0.4										
Fabaceae (Mimosoideae)	*Acacia mearnsii*	black wattle																			4	0.8																								
Fabaceae (Mimosoideae)	*Acacia parramattensis*	Parramatta wattle	1	0.5																																							4	2		
Gentianaceae	**Centaurium erythraea*	common centaury																											10	0.1																
Gentianaceae	*Centaurium* sp.										3	0.5																																		

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG												VZ4 – PCT350 – DNG										VZ5 – PCT351 – MG											
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Geraniaceae	*Geranium solanderi*	native geranium									2	0.1																																		
Goodeniaceae	*Goodenia hederacea*	ivy goodenia									50	2																											80	1					7	0.1
Goodeniaceae	*Goodenia hederacea* subsp. *hederacea*	ivy goodenia											1	0.4																			20	0.8	50	2							100	4		
Goodeniaceae	*Goodenia pinnatifida*	scrambles eggs																																	2	0.4										
Haloragaceae	*Gonocarpus tetragynus*	poverty raspwort									10	3	5	0.4													200	0.1							5	0.4			25	0.1			100	2	1	0.1
Haloragaceae	*Haloragis brownii*	swamp raspwort																			80	0.1																								
Lamiaceae	*Mentha satureioides*	native pennyroyal																							100	4																				
Lauraceae	*Cassytha glabella*																																		50	1										
Lobeliaceae	*Pratia pedunculata*	matted pratia																			200	1																								
Loranthaceae	*Amyema miquelii*	box mistletoe	6	1									10	5					1	1													2	2												
Myrtaceae	*Eucalyptus blakelyi*	Blakely's red gum											2	5	2	10	3	20	20	30	100	65									1	1														
Myrtaceae	*Eucalyptus bridgesiana*	apple box																					3	10																			10	15		
Myrtaceae	*Eucalyptus camaldulensis*	river red gum																					12	10																						
Myrtaceae	*Eucalyptus dives*	broad-leaved peppermint																															2	2			7	10								
Myrtaceae	*Eucalyptus goniocalyx*	bundy	7	20																															8	25					1	5	20	20		
Myrtaceae	*Eucalyptus macrorhyncha*	red stringybark	10	15													1	2	4	5													1	2	3	15	2	5	17	25	5	10	3	5	50	20
Myrtaceae	*Eucalyptus mannifera*	brittle gum																															10	10			10	15								
Myrtaceae	*Eucalyptus melliodora*	yellow box									5	10	10	25	3	20	1	10	5	10			6	10																						
Myrtaceae	*Eucalyptus polyanthemos*	red box																																										2	5				
Myrtaceae	*Eucalyptus rossii*	inland scribbly gum																															20	20	2	15	10	20	25	35	4	10			50	20
Myrtaceae	*Eucalyptus sideroxylon*	mugga ironbark	3	10																																											
Myrtaceae	*Leptospermum multicaule*	silver tea-tree									10	10																							50	15										
Oxalidaceae	*Oxalis perennans*				10	0.4					2	0.1							10	0.1	40	0.1			10	0.4			10	0.1													2	0.1	50	1		

Family Name	Scientific Name	Common Name	VZ1 – PCT289 – MG		VZ2 – PCT335 – MG						VZ3 – PCT350 – MG														VZ4 – PCT350 – DNG								VZ5 – PCT351 – MG													
			4107Jan03		Q33		Q35		4107Feb02		Q1		Q15		Q6		Q31		Q43		DMRP1		P03		Q11		Q32		DMRP3		4107Jan02		4107Feb03		Q16		Q20		Q23		Q26		Q8		Q13		Q42	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Oxalidaceae	*Oxalis pes-caprae*	soursob					10	0.4																																							
Phyllanthaceae	*Poranthera microphylla*	small poranthera									10	2																							5	0.4							100	1		
Plantaginaceae	*Plantago debilis*	shade plantain																							50	1																			
Plantaginaceae	*Plantago lanceolata*	lamb's tongues																							50	0.1			20	0.5														
Plantaginaceae	*Veronica plebeia*	trailing speedwell									5	0.5																																
Polygonaceae	***Acetosella vulgaris*	sheep sorrel			20	0.7					20	2							100	1	500	0.2			50	4	10	0.4	500	0.2			10	0.1							50	0.5			
Polygonaceae	*Rumex brownii*	swamp dock			10	0.6									3	0.2									500	0.4																		
Polygonaceae	*Rumex* sp.	dock																	2	0.1																								
Rosaceae	*Acaena echinata*	sheep's burr																											60	2														
Rosaceae	*Acaena ovina*	acaena																									5	0.1	15	0.8														
Rosaceae	***Rosa rubiginosa*	sweet briar							2	0.2													1	1																				
Rubiaceae	*Pomax umbellata*	pomax							10	0.1																									3	0.4			15	0.1					
Rutaceae	*Boronia* sp.																																				50	0.1						
Solanaceae	**Solanum nigrum*	black-berry nightshade			3	0.4													2	0.4																								
Thymelaeaceae	*Pimelea curviflora*	rice flower																																	2	0.4									
Thymelaeaceae	*Pimelea curviflora* var. *curviflora*																																										10	0.4		
Violaceae	*Viola betonicifolia* subsp. *betonicifolia*	native violet																			200	0.1																								

Table C2 Vegetation Zones 6 to 9

Family Name	Scientific Name	Common Name	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton										VZ9 – PCT351 – Apple			
			Q21		Q30		Q12		Q14		DMRP2		4107Feb04		Q10		Q24		Q36		Q18		Q28		Q29		Q34		4107Feb01		Q9		4107Jan01	
			A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Filicopsida																																				
Adiantaceae	*Cheilanthes sieberi*	rock fern															15	0.4	6	0.4							100	3						
Adiantaceae	*Cheilanthes sieberi* subsp. *sieberi*	rock fern													10	0.3															1	0.1		
Magnoliopsida – Liliidae (Monocots)																																				
Cyperaceae	*Carex appressa*	tall sedge																															5	0.1
Iridaceae	***Romulea rosea* var. *australis***																												5	0.1				
Juncaceae	*Juncus planifolius*																										5	0.4						
Juncaceae	*Juncus* sp.	a rush			3	1	20	1					50	0.1																			10	0.1
Lomandraceae	*Lomandra filiformis*	wattle matt-rush											1000	5									300	2	1000	5			200	0.5			100	8
Lomandraceae	*Lomandra filiformis* subsp. *coriacea*	wattle matt-rush	20	2	50	5	10	0.6	500	15	1000	15			20	0.3	10	2			20	1					50	5			100	1		
Lomandraceae	*Lomandra filiformis* subsp. *filiformis*								5	2																								
Lomandraceae	*Lomandra glauca*	pale mat-rush																															20	0.5
Lomandraceae	*Lomandra multiflora* subsp. *multiflora*	many-flowered mat-rush													2	0.2																	5	0.6
Orchidaceae	*Microtis* sp.																										20	0.4						
Poaceae	***Aira caryophyllea***	silvery hairgrass													50	0.5																		
Poaceae	***Aira cupaniana***	silvery hairgrass	500	5	10	0.4			1000	10									3	0.4	5	0.4			1000	3								
Poaceae	***Aira* sp.**	a hairgrass											50	0.1																				
Poaceae	*Aristida ramosa*	purple wiregrass					500	10	100	10	400	5							50	3			250	1	1000	5	500	10	5	0.1			20	1
Poaceae	*Aristida* sp.	a wiregrass															30	1																
Poaceae	*Aristida vagans*	threeawn speargrass	20	4																														
Poaceae	*Austrodanthonia carphoides*	short wallaby grass					1000	10	100	15							2000	10																

Family Name	Scientific Name	Common	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton										VZ9 – PCT351 – Apple			
Poaceae	*Austrodanthonia duttoniana*	brown-back wallaby grass													100	10																		
Poaceae	*Austrodanthonia eriantha*	wallaby grass																											1	0.1				
Poaceae	*Austrodanthonia fulva*	wallaby grass													100	10									200	1								
Poaceae	*Austrodanthonia monticola*	mountain wallaby grass	500	25	1000	20	1000	15											500	10	500	15					1000	20					40	3
Poaceae	*Austrodanthonia racemosa*	wallaby grass											1000	15																				
Poaceae	*Austrodanthonia setacea*	small-flowered wallaby-grass																									50	3					20	1
Poaceae	*Austrostipa densiflora*	foxtail speargrass									20	0.1																						
Poaceae	*Austrostipa scabra*	speargrass			20	0.3			50	3	200	0.5	100	0.5	1000	30	2000	10			100	5							5	0.1				
Poaceae	*Austrostipa scabra* subsp. *falcata*	rough speargrass					500	15											20	2														
Poaceae	*Austrostipa scabra* subsp. *scabra*	rough speargrass																					250	1	500	2								
Poaceae	**Avena fatua*	wild oats									200	0.1																						
Poaceae	*Bothriochloa macra*	red grass											5	0.1																				
Poaceae	**Briza maxima*	quaking grass																															1000	10
Poaceae	**Briza minor*	shivery grass											25	0.1															25	0.1				
Poaceae	**Bromus molliformis*	soft brome	100	5																														
Poaceae	*Chloris truncata*	windmill grass			100	10	20	0.8			20	0.1																						
Poaceae	*Cynodon dactylon*	common couch											5	0.1			7	0.4					80	0.1	200	0.5								
Poaceae	*Elymus scaber*	common wheatgrass			10	0.5	50	0.4	50	5			200	0.5															20	0.1				
Poaceae	*Eragrostis* sp.	a lovegrass																							100	0.1								
Poaceae	**Hordeum* sp.	a barley grass	50	5																														
Poaceae	*Joycea pallida*	silvertop wallaby grass									200	10			4	0.3	3	1			2	0.4					4	0.4	1	0.1	100	30		
Poaceae	*Microlaena stipoides*	weeping grass									2000	15			1000	30															10	0.5		
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass																	1000	20														

Family Name	Scientific Name	Common	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton								VZ9 – PCT351 – Apple			
Poaceae	*Panicum effusum*	hairy panic					50	2			10	0.1	20	0.1									50	0.1					10	0.1				
Poaceae	***Paspalum dilatatum*	paspalum							50	10																								
Poaceae	*Poa sieberiana*	snowgrass	3	0.4							20	0.2					1000	15											5	0.1	50	10		
Poaceae	*Rytidosperma* sp.										1000	15	2000	25			17	1					100	0.1	1000	5								
Poaceae	*Themeda australis*	kangaroo grass											500	2																				
Poaceae	**Vulpia bromoides*	squirrel tail fesque							1000	15																								
Poaceae	**Vulpia myuros*	rat's tail fescue											50	0.1															100	0.5				
Magnoliopsida – Magnoliidae (Dicots)																																		
Apiaceae	*Hydrocotyle laxiflora*	stinking pennywort													20	0.2											5	0.4						
Asteraceae	***Carthamus lanatus*	saffron thistle							5	0.4																								
Asteraceae	*Cassinia aculeata*	dolly bush															1	0.4									500	40						
Asteraceae	*Cassinia arcuata*	sifton bush													1	0.5							1000	65	1000	65	20	1	200	80				
Asteraceae	*Cassinia laevis*	cough bush													50	10					500	30												
Asteraceae	*Chrysocephalum apiculatum*	common everlasting							5	0.4																								
Asteraceae	**Cirsium vulgare*	spear thistle							5	0.4											2	0.4												
Asteraceae	**Hypochaeris glabra*	smooth catsear	50	10			50	5	20	2																								
Asteraceae	**Hypochaeris radicata*	catsear	10	2	20	1	100	10							2	0.1	1	0.4			20	2			50	0.1								
Asteraceae	*Ozothamnus diosmifolius*	white dogwood																									100	25						
Asteraceae	*Solenogyne dominii*														100	0.2																		
Asteraceae	*Triptilodiscus pygmaeus*	common sunray													20	0.2																		
Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell																													1	0.1		
Campanulaceae	*Wahlenbergia* sp.	bluebell													2	0.1																		
Campanulaceae	*Wahlenbergia stricta*	tall bluebell					50	0.6																										
Caryophyllaceae	**Petrorhagia nanteuilii*	proliferous pink					20	0.6	20	1																	3	0.4						

Family Name	Scientific Name	Common	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton										VZ9 – PCT351 – Apple			
Chenopodiaceae	*Chenopodium pumilio*	small crumbweed									200	0.3																						
Chenopodiaceae	*Einadia nutans* subsp. *nutans*	climbing saltbush			2	0.4																												
Clusiaceae	*Hypericum gramineum*	small St John's wort																									5	0.1						
Clusiaceae	***Hypericum perforatum*	St. Johns wort																			5	0.4					7	0.4						
Dilleniaceae	*Hibbertia obtusifolia*	hoary guinea flower			4	1	10	0.8							1	0.1	6	0.4	50	10							20	3			10	0.2	4	0.01
Dilleniaceae	*Hibbertia* sp.																						40	1	50	0.1					1	0.1		
Ericaceae	*Brachyloma daphnoides*	daphne heath													2	0.2	7	1																
Ericaceae	*Leucopogon ericoides*	pink beard-heath																									1	0.4						
Ericaceae	*Melichrus urceolatus*	urn heath													5	0.3	3	1	5	0.4			50	2	10	0.5	20	3			5	0.5		
Euphorbiaceae	*Chamaesyce drummondii*								5	0.4																								
Fabaceae (Faboideae)	*Daviesia genistifolia*	broom bitter pea																															10	1
Fabaceae (Faboideae)	*Daviesia leptophylla*																																50	4
Fabaceae (Faboideae)	*Dillwynia retorta*																								10	0.1								
Fabaceae (Faboideae)	*Dillwynia sericea*	egg and bacon peas; parrot peas																													20	0.5		
Fabaceae (Faboideae)	*Dillwynia* sp.																2	0.5																
Fabaceae (Faboideae)	*Hardenbergia violacea*	false sarsaparilla																							10	0.1							3	0.8
Fabaceae (Faboideae)	*Hovea heterophylla*																6	0.4															3	0.01
Fabaceae (Faboideae)	**Medicago minima*	woolly burr medic											50	0.1																				
Fabaceae (Faboideae)	*Pultenaea microphylla*	a bush pea																							5	0.1								
Fabaceae (Faboideae)	*Pultenaea* sp.																										1	0.4					3	0.01
Fabaceae (Faboideae)	**Trifolium arvense*	haresfoot clover					50	0.4																										
Fabaceae (Faboideae)	**Trifolium subterraneum*	subterranean clover									4000	15																						
Fabaceae	*Acacia dealbata*	silver wattle	5	0.5											20	20							15	10							1	0.1	100	15

Family Name	Scientific Name	Common	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton										VZ9 – PCT351 – Apple			
(Mimosoideae)																																		
Fabaceae (Mimosoideae)	*Acacia genistifolia*	early wattle									6	0.6											1	1										
Fabaceae (Mimosoideae)	*Acacia parramattensis*	Parramatta wattle															12	25	500	45			2	1										
Gentianaceae	**Centaurium erythraea*	common centaury																					60	0.1	10	0.1	100	3						
Goodeniaceae	*Goodenia hederacea*	ivy goodenia													2	0.1									50	0.1	10	0.6						
Goodeniaceae	*Goodenia hederacea* subsp. *hederacea*	ivy goodenia					10	0.5																							5	0.2		
Haloragaceae	*Gonocarpus tetragynus*	poverty raspwort	50	1											20	0.2	30	1					25	0.1									4	0.01
Lamiaceae	*Mentha satureioides*	native pennyroyal					100	3	10	0.4																								
Loranthaceae	*Amyema miquelii*	box mistletoe															1	0.5																
Loranthaceae	*Amyema pendulum*														1	0.1																		
Loranthaceae	*Amyema* sp.	mistletoe																													20	0.5		
Myrtaceae	*Eucalyptus blakelyi*	Blakely's red gum																															2	5
Myrtaceae	*Eucalyptus cinerea*	argyle apple																													7	20	4	5
Myrtaceae	*Eucalyptus dives*	broad-leaved peppermint																															2	5
Myrtaceae	*Eucalyptus goniocalyx*	bundy																			1	1									1	5		
Myrtaceae	*Eucalyptus mannifera*	brittle gum																															1	5
Myrtaceae	*Eucalyptus melliodora*	yellow box																															2	2
Myrtaceae	*Leptospermum multicaule*	silver tea-tree													5	5	40	15																
Oxalidaceae	*Oxalis exilis*														10	0.2																		
Oxalidaceae	*Oxalis perennans*				5	0.4	100	6	20	0.4			5	0.1																				
Oxalidaceae	*Oxalis* sp.																15	0.4																
Plantaginaceae	**Plantago lanceolata*	lamb's tongues					50	2																										
Plantaginaceae	*Plantago* sp.	plantain																					5	0.1										
Polygonaceae	***Acetosella vulgaris*	sheep sorrel	1000	10			50	1	100	15	200	0.2									20	2					5	0.4	1	0.1				

Family Name	Scientific Name	Common	VZ6 – PCT351 – DNG												VZ7 – PCT351 – Acacia						VZ8 – PCT351 – Sifton										VZ9 – PCT351 – Apple			
Polygonaceae	*Rumex brownii*	swamp dock											10	0.1									10	0.1										
Rosaceae	**Rubus anglocandicans*	blackberry																															1	1
Rubiaceae	*Galium gaudichaudii*	rough bedstraw																													3	0.1		
Rubiaceae	*Pomax umbellata*	pomax											10	0.1			1	0.4																
Violaceae	*Viola betonicifolia* subsp. *betonicifolia*	native violet													1	0.1																		

Fauna Species List

The following list was developed from surveys undertaken across the Development Corridor. Details of the survey methodologies undertaken are provided in **Section 2** of the main report.

The following abbreviations or symbols are used in the list:

BC Act	*Biodiversity Conservation Act 2016*
EPBC Act	*Environment Protection Biodiversity Conservation Act 1999*
V	Vulnerable
E	Endangered
CE	Critically Endangered
MIG	Migratory
asterisk (*)	denotes species not indigenous to the Development Corridor.

Birds recorded use the scientific and common name nomenclature of BirdLife Australia. Reptiles recorded use the scientific and common name nomenclature of Cogger (2014). Amphibians recorded use the scientific and common name nomenclature of Cogger (2014), and mammals recorded use the scientific and common name nomenclature of Van Dyke and Strahan (2008).

Table C3 Fauna Species Identified in the Development Corridor

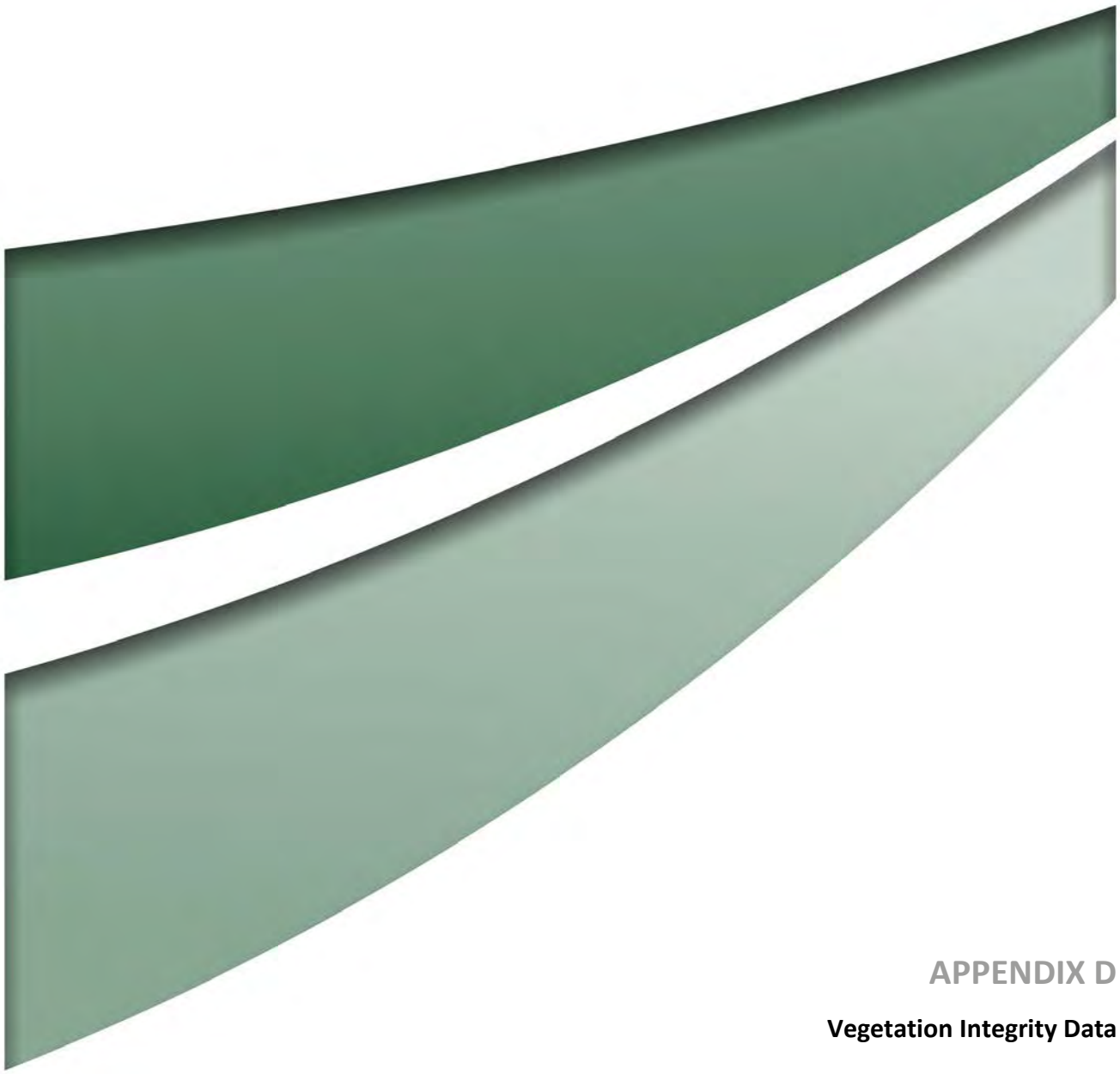
Family	Scientific Name	Common Name	BC Act	EPBC Act
AMPHIBIA				
HYLIDAE	*Litoria fallax*	eastern dwarf tree frog		
HYLIDAE	*Litoria* sp.	a tree frog		
MYOBATRACHIDAE	*Crinia parinsignifera*	eastern sign-bearing froglet		
MYOBATRACHIDAE	*Crinia signifera*	common froglet		
MYOBATRACHIDAE	*Limnodynastes peronii*	brown-striped frog		
MYOBATRACHIDAE	*Limnodynastes tasmaniensis*	spotted grass frog		
MYOBATRACHIDAE	*Uperoleia laevigata*	smooth toadlet		
AVES				
ACANTHIZIDAE	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		
ACANTHIZIDAE	*Acanthiza lineata*	striated thornbill		
ACANTHIZIDAE	*Acanthiza nana*	yellow thornbill		
ACANTHIZIDAE	*Acanthiza pusilla*	brown thornbill		
ACANTHIZIDAE	*Acanthiza reguloides*	buff-rumped thornbill		
ACANTHIZIDAE	*Chthonicola sagittata*	speckled warbler	V	

Family	Scientific Name	Common Name	BC Act	EPBC Act
ACANTHIZIDAE	*Gerygone fusca*	western gerygone		
ACANTHIZIDAE	*Gerygone oliveacea*	white-throated gerygone		
ACANTHIZIDAE	*Hylacola pyrrhopygia*	chestnut-rumped heathwren		
ACANTHIZIDAE	*Sericornis frontalis*	white-browed scrubwren		
ACANTHIZIDAE	*Smicrornis brevirostris*	weebill		
ACCIPITRIDAE	*Aquila audax*	wedge-tailed eagle		
ACCIPITRIDAE	*Elanus axillaris*	black-shouldered kite		
ACROCEPHALIDAE	*Acrocephalus australis*	Australian reed-warbler		MIG
ALCEDINIDAE	*Dacelo novaeguineae*	laughing kookaburra		
ALCEDINIDAE	*Todiramphus macleayii*	forest kingfisher		
ALCEDINIDAE	*Todiramphus sanctus*	sacred kingfisher		
ANATIDAE	*Chenonetta jubata*	wood duck		
APODIDAE	*Hirundapus caudacutus*	white-throated needletail		V, MIG
ARDEIDAE	*Egretta novaehollandiae*	white-faced heron		
ARTAMIDAE	*Artamus cyanopterus*	dusky woodswallow	V	
ARTAMIDAE	*Artamus* sp.	a woodswallow		
ARTAMIDAE	*Cracticus nigrogularis*	pied butcherbird		
ARTAMIDAE	*Cracticus tibicen*	Australian magpie		
ARTAMIDAE	*Cracticus torquatus*	grey butcherbird		
ARTAMIDAE	*Strepera graculina*	pied currawong		
CACATUIDAE	*Cacatua galerita*	sulphur-crested cockatoo		
CACATUIDAE	*Eolophus roseicapillus*	galah		
CACATUIDAE	*Eolophus roseicapillus albiceps*	galah (albiceps)		
CAMPEPHAGIDAE	*Coracina novaehollandiae*	black-faced cuckoo-shrike		
CAMPEPHAGIDAE	*Lalage sueurii*	white-winged triller		
CHARADRIIDAE	*Vanellus miles*	masked lapwing		
CLIMACTERIDAE	*Cormobates leucophaea*	white-throated treecreeper		
COLUMBIDAE	*Ocyphaps lophotes*	crested pigeon		
COLUMBIDAE	*Phaps chalcoptera*	common bronzewing		
CORACIIDAE	*Eurystomus orientalis*	dollarbird		
CORCORACIDAE	*Corcorax melanorhamphos*	white-winged chough		
CORVIDAE	*Corvus coronoides*	Australian raven		

Family	Scientific Name	Common Name	BC Act	EPBC Act
CUCULIDAE	*Cacomantis pallidus*	pallid cuckoo		
ESTRILDIDAE	*Neochmia temporalis*	red-browed Finch		
ESTRILDIDAE	*Stagonopleura guttata*	diamond firetail	V	
FALCONIDAE	*Falco berigora*	brown falcon		
FALCONIDAE	*Falco cenchroides*	nankeen kestrel		
HIRUNDINIDAE	*Hirundo neoxena*	welcome swallow		
MALURIDAE	*Malurus cyaneus*	superb fairy-wren		
MALURIDAE	*Malurus cyaneus*	superb fairy-wren (cyaneus)		
MELIPHAGIDAE	*Acanthorhynchus tenuirostris*	eastern spinebill		
MELIPHAGIDAE	*Anthochaera carunculata*	red wattlebird		
MELIPHAGIDAE	*Epthianura albifrons*	white-fronted chat	V	
MELIPHAGIDAE	*Lichenostomus chrysops*	yellow-faced honeyeater		
MELIPHAGIDAE	*Lichenostomus leucotis*	white-eared honeyeater		
MELIPHAGIDAE	*Lichenostomus penicillatus*	white-plumed honeyeater		
MELIPHAGIDAE	*Manorina melanocephala*	noisy miner		
MELIPHAGIDAE	*Meliphaga lewinii*	Lewin's honeyeater		
MELIPHAGIDAE	*Philemon corniculatus*	noisy friarbird		
MEROPIDAE	*Merops ornatus*	rainbow bee-eater		MIG
MONARCHIDAE	*Grallina cyanoleuca*	magpie-lark		
MONARCHIDAE	*Myiagra inquieta*	restless flycatcher		
MONARCHIDAE	*Myiagra rubecula*	leaden flycatcher		
MONARCHIDAE	*Myiagra rubecula concinna*	leaden flycatcher (concinna)		
MOTACILLIDAE	*Anthus novaeseelandiae*	Australian pipit		
NECTARINIIDAE	*Dicaeum hirundinaceum*	mistletoebird		
NEOSITTIDAE	*Daphoenositta chrysoptera*	varied sittella	V	
ORIOLIDAE	*Oriolus sagittatus*	olive-backed oriole		
PACHYCEPHALIDAE	*Colluricincla harmonica*	grey shrike-thrush		
PACHYCEPHALIDAE	*Pachycephala pectoralis*	golden whistler		
PACHYCEPHALIDAE	*Pachycephala rufiventris*	rufous whistler		
PARDALOTIDAE	*Pardalotus punctatus*	spotted pardalote		
PARDALOTIDAE	*Pardalotus striatus*	striated pardalote		
PETROICIDAE	*Eopsaltria australis*	eastern yellow robin		
PETROICIDAE	*Petroica boodang campbelli*	scarlet robin (campbelli)		

Family	Scientific Name	Common Name	BC Act	EPBC Act
PETROICIDAE	*Petroica goodenovii*	red-capped robin		
PHALACROCORACIDAE	*Microcarbo melanoleucos*	little pied cormorant		
POMATOSTOMIDAE	*Pomatostomus superciliosus*	white-browed babbler		
PSITTACIDAE	*Alisterus scapularis*	Australian king-parrot		
PSITTACIDAE	*Platycercus elegans*	crimson rosella		
PSITTACIDAE	*Platycercus eximius*	eastern rosella		
PSITTACIDAE	*Polytelis swainsonii*	superb parrot	V	V
PSITTACIDAE	*Psephotus haematonotus*	red-rumped parrot		
RHIPIDURIDAE	*Rhipidura albiscapa*	grey fantail		
RHIPIDURIDAE	*Rhipidura leucophrys*	willie wagtail		
STURNIDAE	**Sturnus vulgaris*	common starling		
MAMMALIA				
BOVIDAE	**Capra hircus*	goat		
BOVIDAE	**Ovis aries*	sheep		
CANIDAE	**Vulpes*	red fox		
CERVIDAE	**Dama*	fallow deer		
DASYURIDAE	*Antechinus flavipes*	yellow-footed antechinus		
DASYURIDAE	*Antechinus* sp.	an antechinus		
EMBALLONURIDAE	*Saccolaimus flaviventris*	yellow-bellied sheathtail-bat	V	
LEPORIDAE	**Oryctolagus cuniculus*	rabbit		
MACROPODIDAE	*Macropus giganteus*	eastern grey kangaroo		
MACROPODIDAE	*Macropus robustus*	wallaroo		
MACROPODIDAE	*Macropus rufogriseus*	red-necked wallaby		
MACROPODIDAE	*Wallabia bicolor*	swamp wallaby		
MOLOSSIDAE	*Austronomus australis*	white-striped freetail-bat		
MOLOSSIDAE	*Mormopterus petersi*	inland free-tailed bat		
MOLOSSIDAE	*Mormopterus planiceps*	south-eastern freetail bat		
PETAURIDAE	*Petaurus norfolcensis*	squirrel glider	V	
PETAURIDAE	*Petaurus* sp.	a glider		
PHALANGERIDAE	*Trichosurus vulpecula*	common brushtail possum		
PSEUDOCHEIRIDAE	*Pseudocheirus peregrinus*	common ringtail possum		
TACHYGLOSSIDAE	*Tachyglossus aculeatus*	short-beaked echidna		

Family	Scientific Name	Common Name	BC Act	EPBC Act
VESPERTILIONIDAE	*Chalinolobus gouldii*	Gould's wattled bat		
VESPERTILIONIDAE	*Chalinolobus morio*	chocolate wattled bat		
VESPERTILIONIDAE	*Falsistrellus tasmaniensis*	eastern false pipistrelle	V	
VESPERTILIONIDAE	*Miniopterus orianae oceanensis*	large bent-winged bat	V	
VESPERTILIONIDAE	*Myotis macropus*	southern myotis	V	
VESPERTILIONIDAE	*Scotorepens balstoni*	inland Broad-nosed Bat		
VESPERTILIONIDAE	*Vespadelus vulturnus*	little forest bat		
REPTILIA				
AGAMIDAE	*Pogona barbata*	bearded dragon		
CHELIDAE	*Chelodina longicollis*	snake-necked turtle		
DIPLODACTYLIDAE	*Diplodactylus vittatus*	eastern stone gecko		
ELAPIDAE	*Pseudechis porphyriacus*	red-bellied black snake		
SCINCIDAE	*Ctenotus sp.*	a skink		
SCINCIDAE	*Egernia cunninghami*	Cunningham's skink		
SCINCIDAE	*Egernia striolata*	tree skink		
SCINCIDAE	*Lampropholis guichenoti*	pale-flecked garden sunskink		
SCINCIDAE	*Morethia boulengeri*	south-eastern morethia skink		
SCINCIDAE	*Saiphos equalis*	three-toed skink		
SCINCIDAE	*Tiliqua rugosa*	shingle-back		
VARANIDAE	*Varanus varius*	lace monitor		
LEPIDOPTERA				
CASTNIIDAE	*Synemon plana*	golden sun moth	E	CE



APPENDIX D

Vegetation Integrity Data

Vegetation Integrity Data

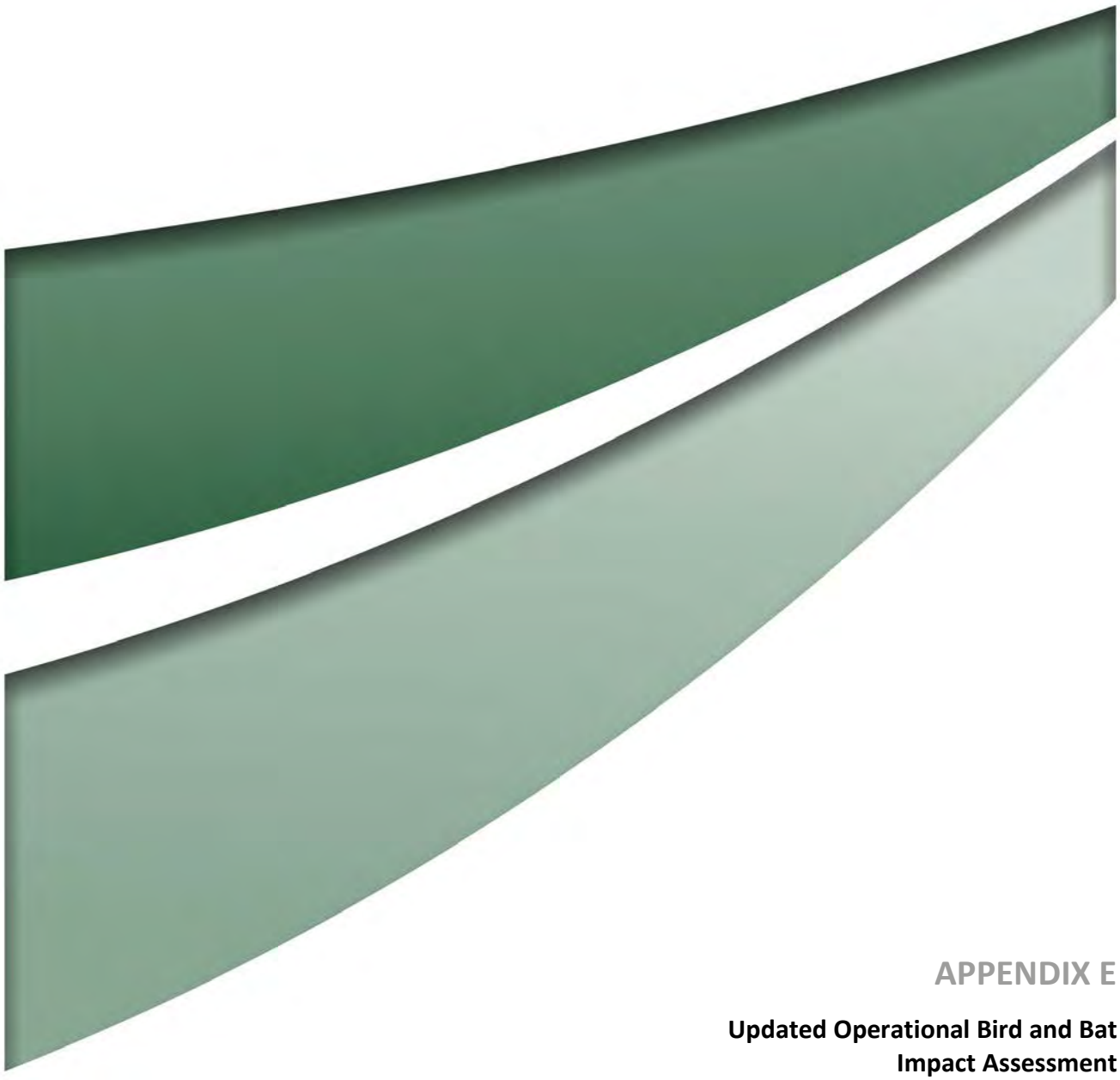
The following vegetation integrity data was collected from surveys of the Development Corridor. It includes the composition, structure and function attributes that are recorded in each BAM plot. This data is assessed against benchmark data for PCTs and entered into the BAM Calculator to assess the condition of each PCT in the Indicative Development Footprints.

The following abbreviations are used in the table below:

Tr	Tree (growth form)
Sh	Shrub (growth form)
Gr	Grass (growth form)
Fb	Forb (growth form)
Fn	Fern (growth form)
Ot	Other (growth form)

	COMPOSITION						STRUCTURE						FUNCTION										
	Tr	Sh	Gr	Fb	Fn	Ot	Tr	Sh	Gr	Fb	Fn	Ot	Regen	Stem Classes (cm)					No. Large Trees	No. Hollow Trees	Litter (%)	Fallen Logs (m)	High Threat Weeds
													>5	5-10	10-20	20-30	30-50	50-80					
VZ 1 – PCT289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion – *Moderate to Good*																							
4107Jan03	4	5	4	1	0	2	45.5	21	23	0	0	1.5	1	1	1	1	1	1	3	1	80.6	59	0
VZ 2 – PCT 335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion – *Moderate to Good*																							
33	0	0	11	2	0	0	0	0	84.4	1	0	0	0	0	0	0	0	0	0	0	78	8	0
35	0	0	7	0	0	0	0	0	92.2	0	0	0	0	0	0	0	0	0	0	0	40	0	0
4107Feb02	0	0	7	0	0	0	0	0	16.4	0	0	0	0	0	0	0	0	0	0	0	97	1	1.7
VZ 3 – PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion – *Moderate to Good*																							
1	2	5	10	12	0	0	15	35	79.2	13	0	0	1	1	1	0	1	1	1	1	9	26	0
15	2	1	6	3	0	1	30	1	11	1.2	0	5	1	1	1	1	1	1	1	1	82	144	0
6	3	0	9	1	0	0	30.1	0	24.8	0.2	0	0	1	0	1	1	1	1	1	0	48	10	0
31	3	0	15	0	0	0	32	0	88.2	0	0	0	1	0	0	0	1	1	3	4	42	48	0
43	3	0	7	3	0	1	45.0	0.0	12.5	0.3	0.0	1.0	1	1	1	1	0	1	2	3	74	70	1
DMRP1	1	1	9	8	0	0	65	0.8	5.7	1.7	0	0	1	1	1	1	1	1	4	4	88	33	0.3
P03	3	0	2	0	0	1	0.3	0	0	0	0	0	1	1	1	1	1	1	0	0	70.8	6	0
VZ 4 – PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion – *Derived Native Grassland*																							
11	0	0	15	4	0	0	0	0	53.8	5.2	0	0	1	0	0	0	0	0	0	0	23	0	0
32	0	0	12	1	0	0	0	0	90	1	0	0	1	0	0	0	0	0	0	0	93.8	0	0
DMRP3	1	2	8	12	0	2	0.1	0.4	71.4	1.3	0	0.2	1	0	0	0	0	0	0	0	2.6	0	0.2
4107Jan02	1	0	6	3	1	2	1	0	4.9	3.3	1	0	1	0	0	1	0	0	0	0	3.4	1	5
4107Feb03	0	0	5	0	0	0	0	0	5.5	0	0	0	1	0	0	0	0	0	0	0	73.6	0	1
VZ 5 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – *Moderate to Good*																							
16	5	7	7	3	0	1	34.5	11.2	31.2	5.6	0	2	1	1	1	1	1	0	0	0	58	119	0
20	4	5	5	7	0	2	55.4	35.8	10.4	5	0	3	1	1	1	1	1	0	0	3	25	246	0
23	5	3	3	2	0	1	50.4	6	45	3.4	0	0.4	1	1	1	1	1	0	0	10	80.4	207	0
26	2	8	5	5	0	0	60	11.3	27.6	3.2	0	0	1	1	1	1	1	0	0	3	78	29.5	0
8	4	0	9	1	0	0	30	0	61.3	0.1	0	0	1	0	0	1	1	1	4	8	41	154	0
13	4	0	9	1	0	0	30	0	61.3	0.1	0	0	1	1	1	1	1	1	8	2	24	49	0
42	2	2	5	2	0	0	40.0	0.7	5.1	0.2	0.0	0.0	1	1	1	1	1	0	2	2	87.0	54.0	0
VZ 6 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – *Derived Native Grassland*																							
21	1	0	7	1	0	0	0.5	0	46.4	1	0	0	1	0	0	0	0	0	0	0	84	92	0
30	0	1	7	2	0	0	0	1	37.2	0.8	0	0	1	0	0	0	0	0	0	0	2	0	0

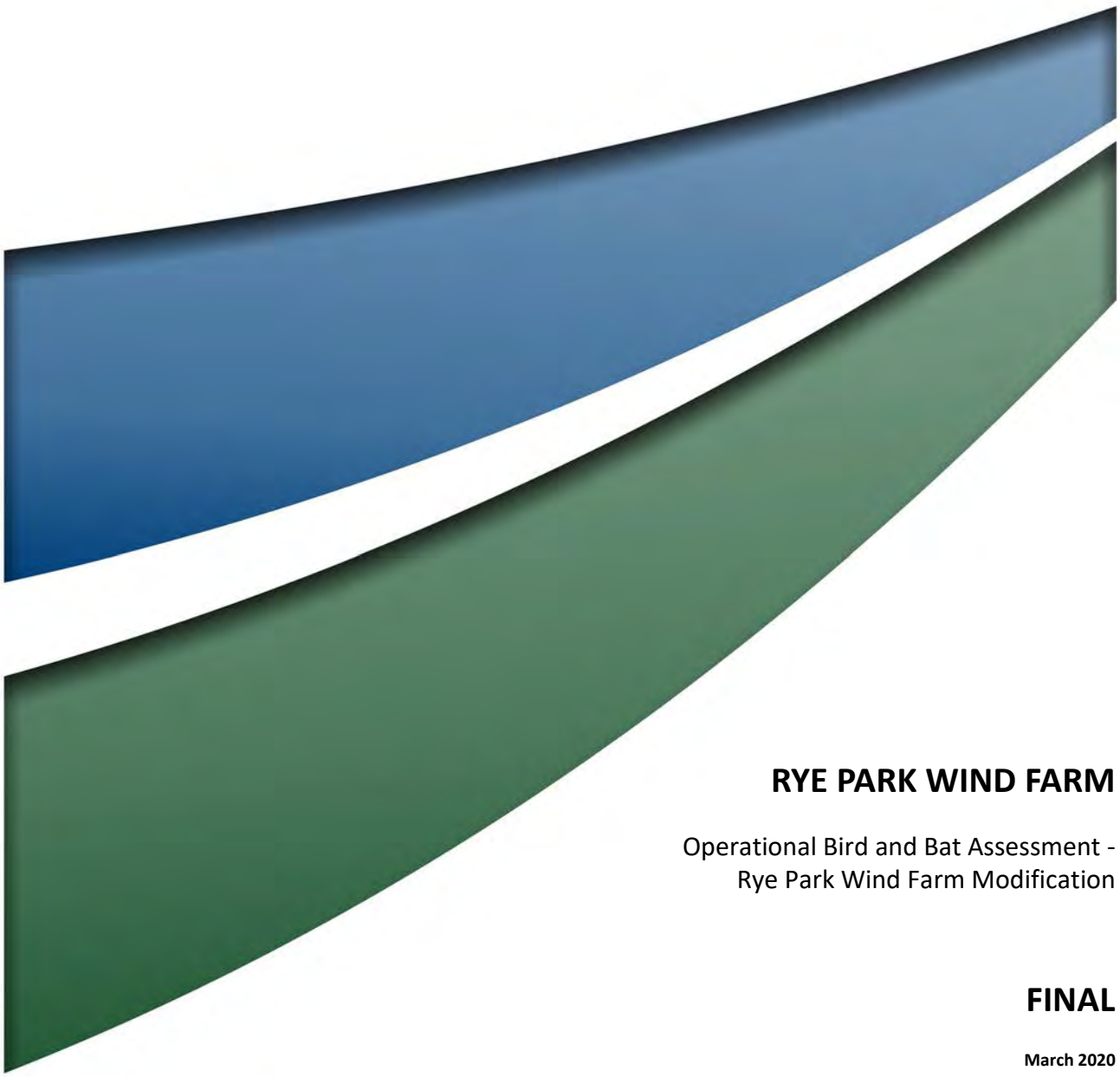
	COMPOSITION						STRUCTURE						FUNCTION										
	Tr	Sh	Gr	Fb	Fn	Ot	Tr	Sh	Gr	Fb	Fn	Ot	Regen	Stem Classes (cm)					No. Large Trees	No. Hollow Trees	Litter (%)	Fallen Logs (m)	High Threat Weeds
													>5	5-10	10-20	20-30	30-50	50-80					
12	0	1	9	4	0	0	0	0.8	54.8	10.1	0	0	1	0	0	0	0	0	0	0	14.6	0	0
14	0	0	9	4	0	0	0	0	85	1.6	0	0	1	0	0	0	0	0	0	1	29	73	0
DMRP2	0	1	10	1	0	0	0	0.6	54.1	0.3	0	0	1	0	0	0	0	0	0	0	6	0	0.2
4107Feb 04	0	0	10	2	0	0	0	0	48.4	0.2	0	0	1	0	0	0	0	0	0	0	85	2	0
VZ 7 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – *Acacia Shrubland*																							
10	1	6	8	8	1	1	20	16.1	81.3	1.3	0.3	0.1	1	0	0	0	0	0	0	0	14.4	21	0
24	1	6	8	4	1	1	25	18.3	40.4	2.2	0.4	0.5	1	1	1	1	1	1	1	3	35	45	0
36	1	2	5	0	1	0	45	10.4	35.4	0	0.4	0	1	1	1	1	0	0	0	0	48.2	8	0
VZ 8 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – *Sifton Bush Shrubland*																							
18	1	1	5	0	0	0	1	30	21.8	0	0	0	0	0	0	0	0	0	0	0	15.8	37	0
28	2	4	6	3	0	0	11	69	4.3	0.3	0	0	0	0	0	0	0	0	0	0	41	0.5	0
29	0	5	8	1	0	1	0	65.8	21.6	0.1	0	0.1	0	0	0	0	0	0	0	0	41	9	0
34	0	7	6	3	1	0	0	72.8	38.8	1.4	3	0	0	0	0	0	0	0	0	0	60	10	0
4107Feb 01	0	1	8	1	0	0	0	80	1.2	0.1	0	0	0	0	0	0	0	0	0	0	82.4	32	0.2
VZ 9 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – *Argyle Apple Forest*																							
9	3	4	4	3	1	1	25.1	1.3	41.5	0.4	0.1	0.5	1	1	1	1	0	1	2	0	41	25	0
4107Jan 01	6	4	8	2	0	1	37	5	14.3	0	0	0.8	1	0	1	1	1	1	7	6	69	131	0



APPENDIX E

Updated Operational Bird and Bat Impact Assessment

umwelt
Environmental & Social Consultants



RYE PARK WIND FARM

Operational Bird and Bat Assessment -
Rye Park Wind Farm Modification

FINAL

March 2020

RYE PARK WIND FARM

Operational Bird and Bat Assessment - Rye Park Wind Farm Modification

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Tilt Renewables

Project Director:	Allison Riley
Project Manager:	Bill Wallach
Report No.	4107/R07
Date:	March 2020

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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
4	Allison Riley	18 March 2020	Allison Riley	18 March 2020

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Figures

Graphs

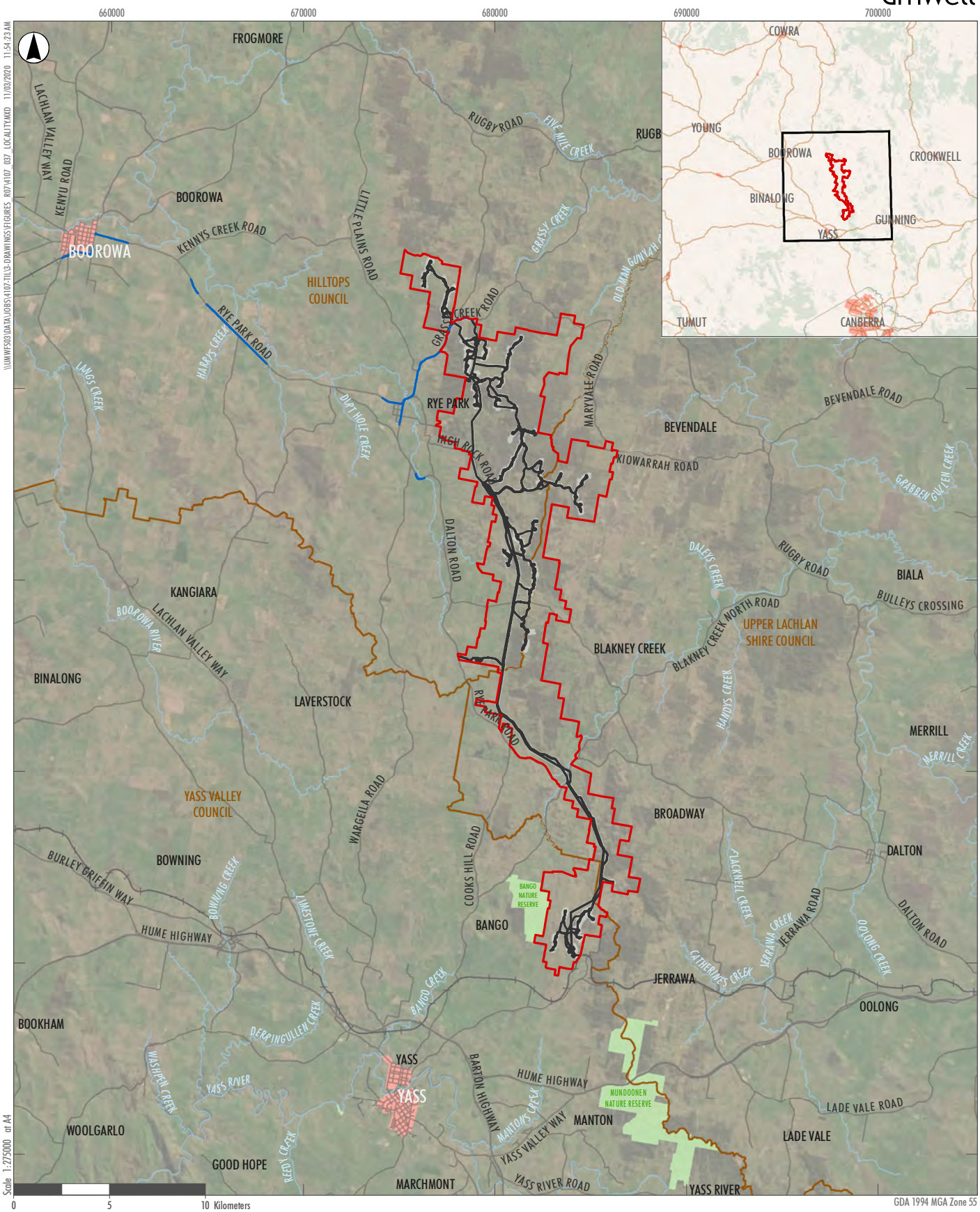
Tables

1.0 Introduction

Rye Park Renewable Energy Pty Ltd was granted State and Federal planning approval with conditions in May 2017 and December 2017 respectively to construct a wind farm comprising 92 wind turbines, on a site located in the Hilltops, Yass Valley and Upper Lachlan Local Government Areas in New South Wales. The site is located approximately 4 kilometres (km) east of the township of Rye Park and 250 km south west of Sydney, on the edge of the Southern Tablelands and the South West Slopes Bioregions.

The Rye Park Wind Farm site boundary (hereafter referred to as the Project Area) encompasses approximately 14,000 hectares (**Figure 1.1**). It spans approximately 37 km along a prominent NNW – SSE aligned ridge from a location 17 km east of Boorowa at its northern boundary to a location 11 km north-east of Yass at its southern boundary.

The proponent engaged Umwelt to undertake a comparative assessment of the risk that blade strike poses for birds and bats associated with the existing approved turbine layout versus a proposed modification to both the total number of turbines and turbine dimensions. The modification application would be submitted to the NSW Department of Planning, Industry and Environment (DPIE) for assessment and approval.



Legend

- Rye Park Wind Farm Site Boundary
- Rye Park Wind Farm Modified Indicative Development Footprint – External Roads
- Rye Park Wind Farm Modified Indicative Development Footprint – Wind Farm
- Rye Park Wind Farm Modified Development Corridor
- Watercourses
- Major Roads
- Railways
- Local Government Areas
- Built Up Areas
- NPWS Estate

FIGURE 1.1

Locality Plan

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

2.0 Proposed modification

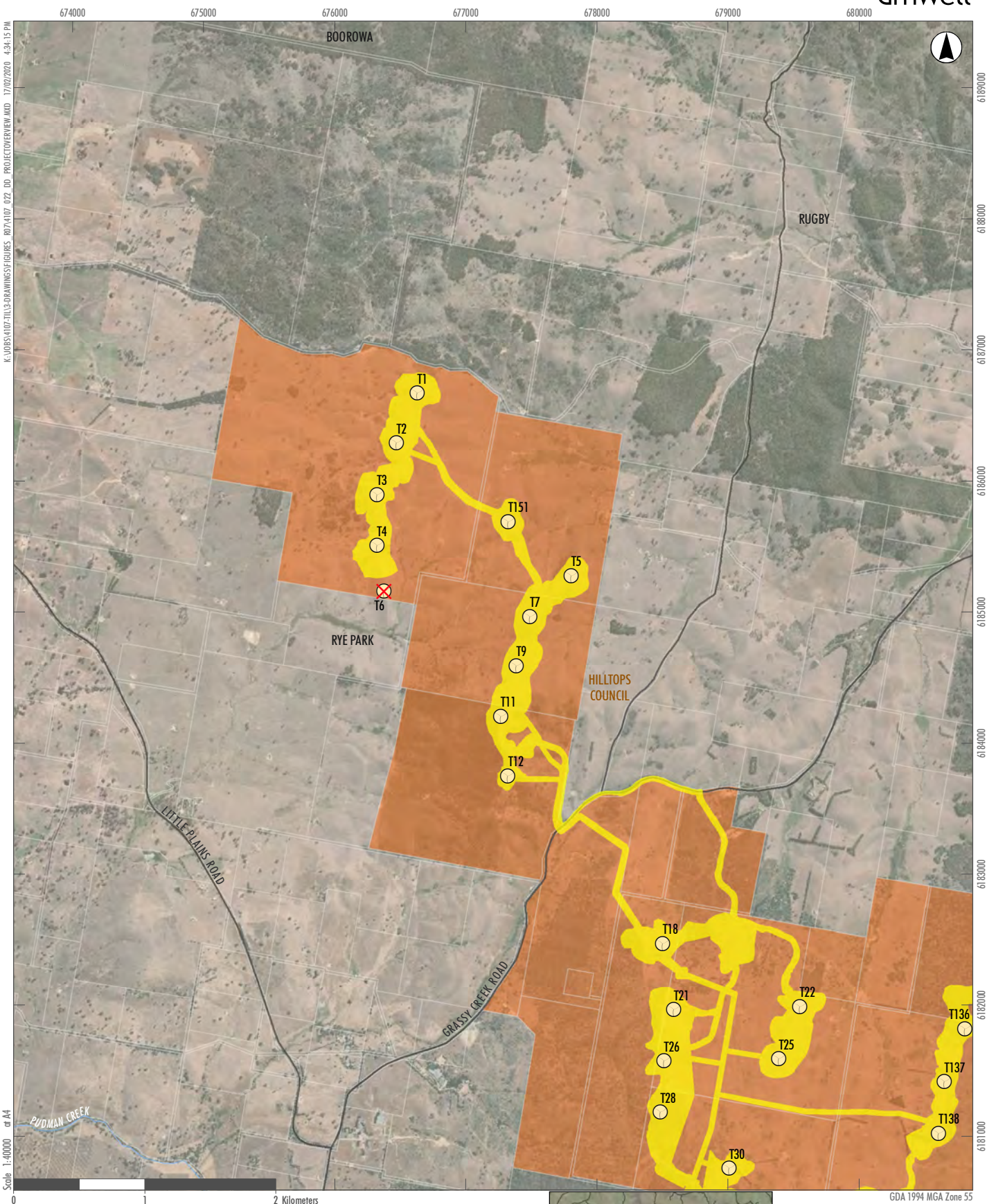
The proposed modification comprises a reduction in the approved number of turbines from 92 to 80 and an increase in maximum blade tip height.

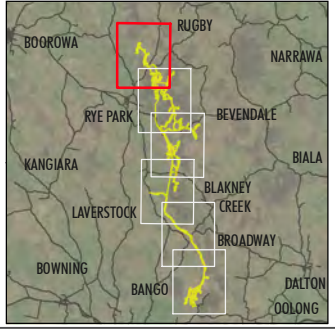
The turbines to be removed were positioned in the northern section (6), north-eastern section (35, 38), central section (52, 53, 56, 77, 140 149) and the southern section (102, 103, 104) of the Project Area (**Figure 2.1**).

For the purpose of this assessment a worst-case maximum rotor swept area (RSA) has been assessed (which results in a slight increase in ground clearance compared with what was originally assessed). The indicative turbine specifications and total size of the rotor swept area (RSA) assessed, of each turbine and of the wind farm as a whole, is set out below (**Table 2.1**).

Table 2.1 Comparison between specifications of the approved design vs the proposed modification

	Approved Project	Modification	Total extent of change
Number of turbines	92	80	Reduction by 12 turbines (13%)
Rotor diameter	130m *(indicative)*	170m *(indicative)*	Increase by up to 40 metres (31%)
Maximum tip height	157m	200m	Increase maximum blade tip height by up to 43 metres (27%)
Ground clearance	27m *(indicative)*	30m *(indicative)*	Increase ground clearance by 3 metres (11%)
Rotor swept area / turbine (m^2)	13,267m^2 *(indicative)*	22,698m^2 *(indicative)*	Increase by 9,431m^2 (71%)
Total rotor swept area for wind farm (m^2)	1,220,564m^2 *(indicative)*	1,815,840m^2 *(indicative)*	Increase by 595,276m^2 (49%)





Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

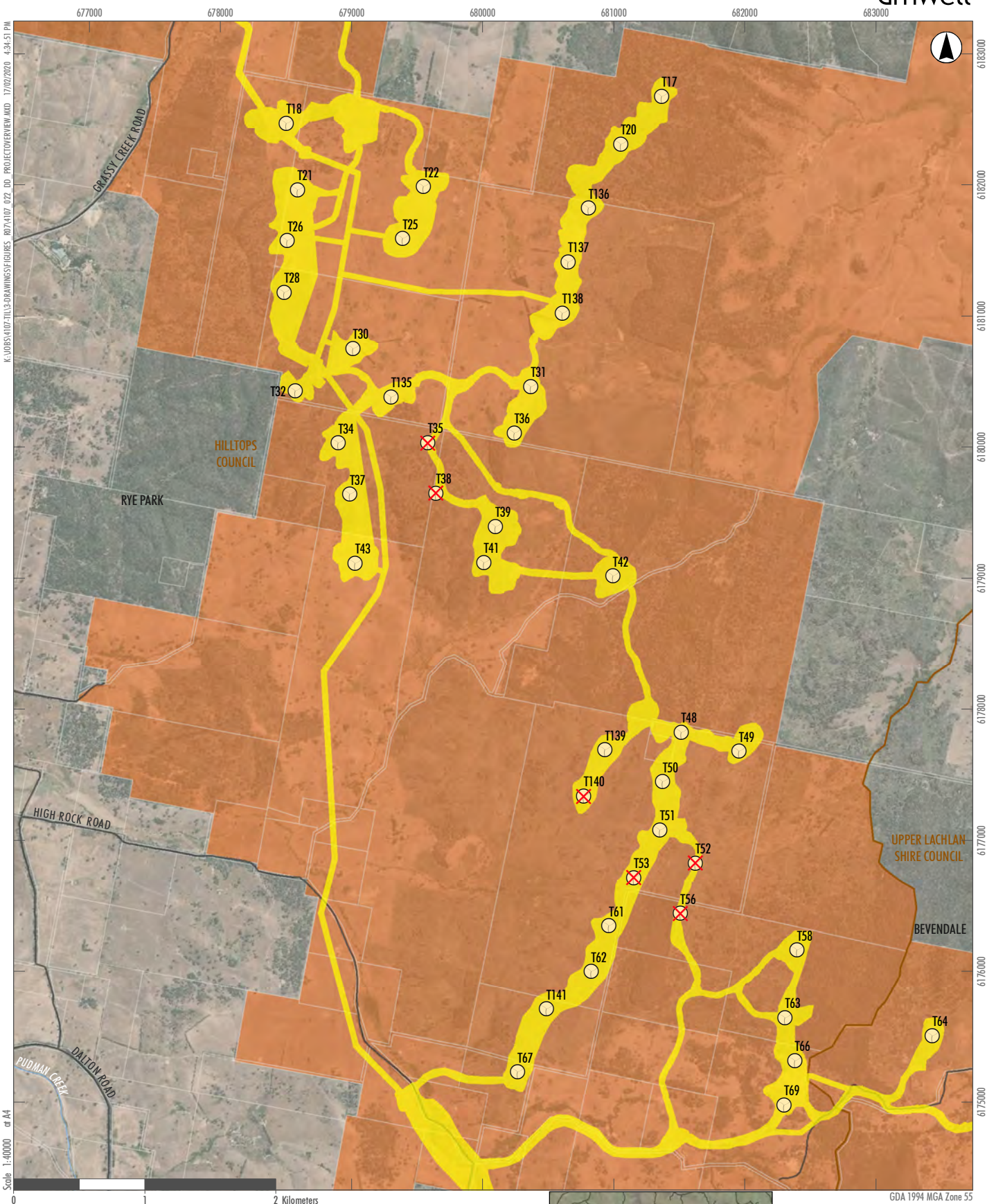
Previously Approved Turbine Locations

- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;

FIGURE 2.1.1

Location of Turbines to be Removed



Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

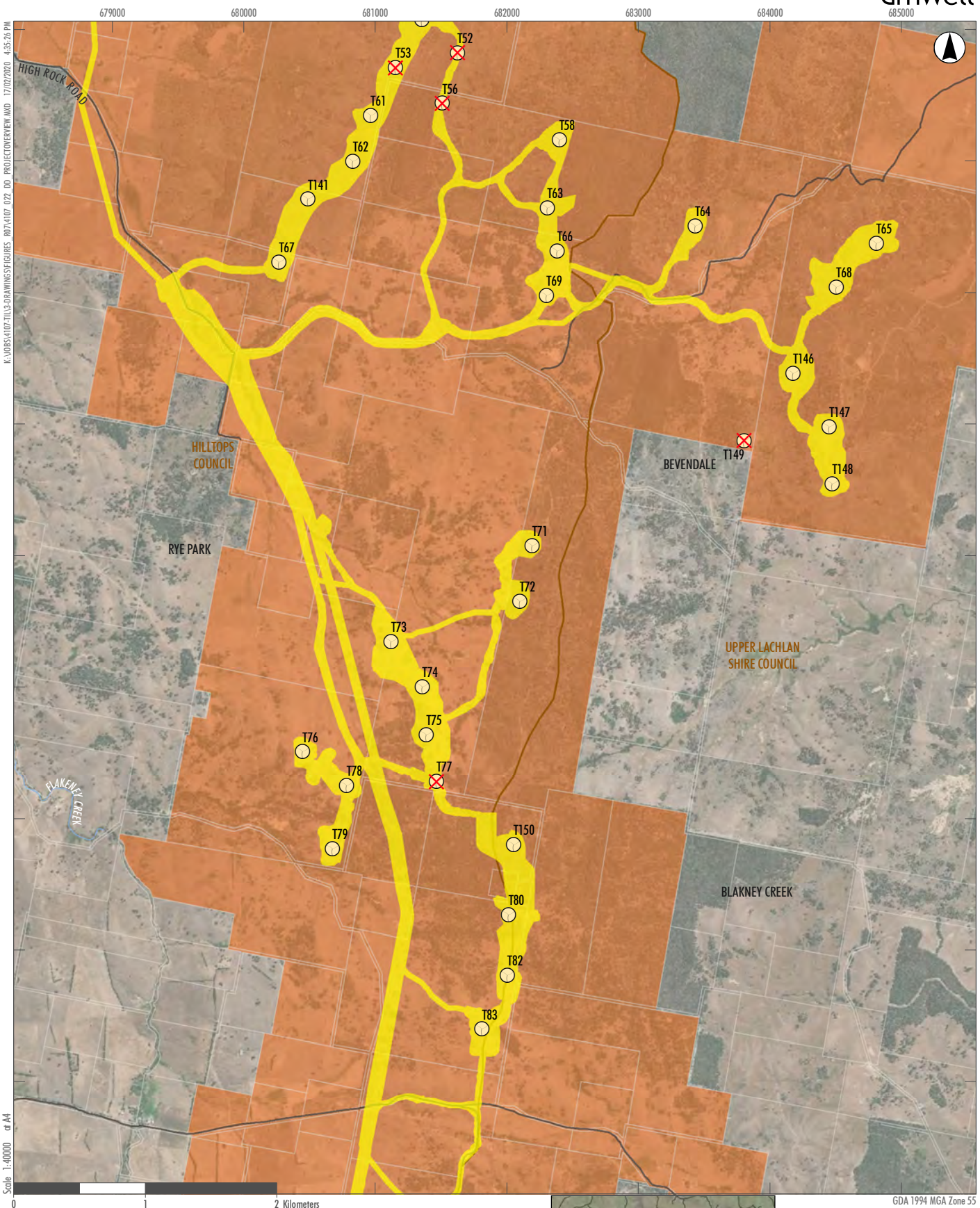
Previously Approved Turbine Locations

- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses

FIGURE 2.1.2

Location of Turbines to be Removed

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;



Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

Previously Approved Turbine Locations

- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses

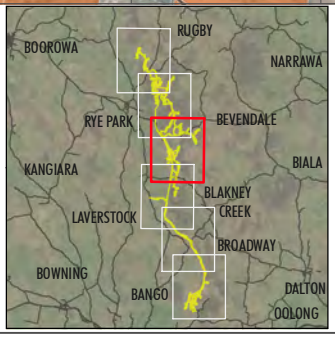
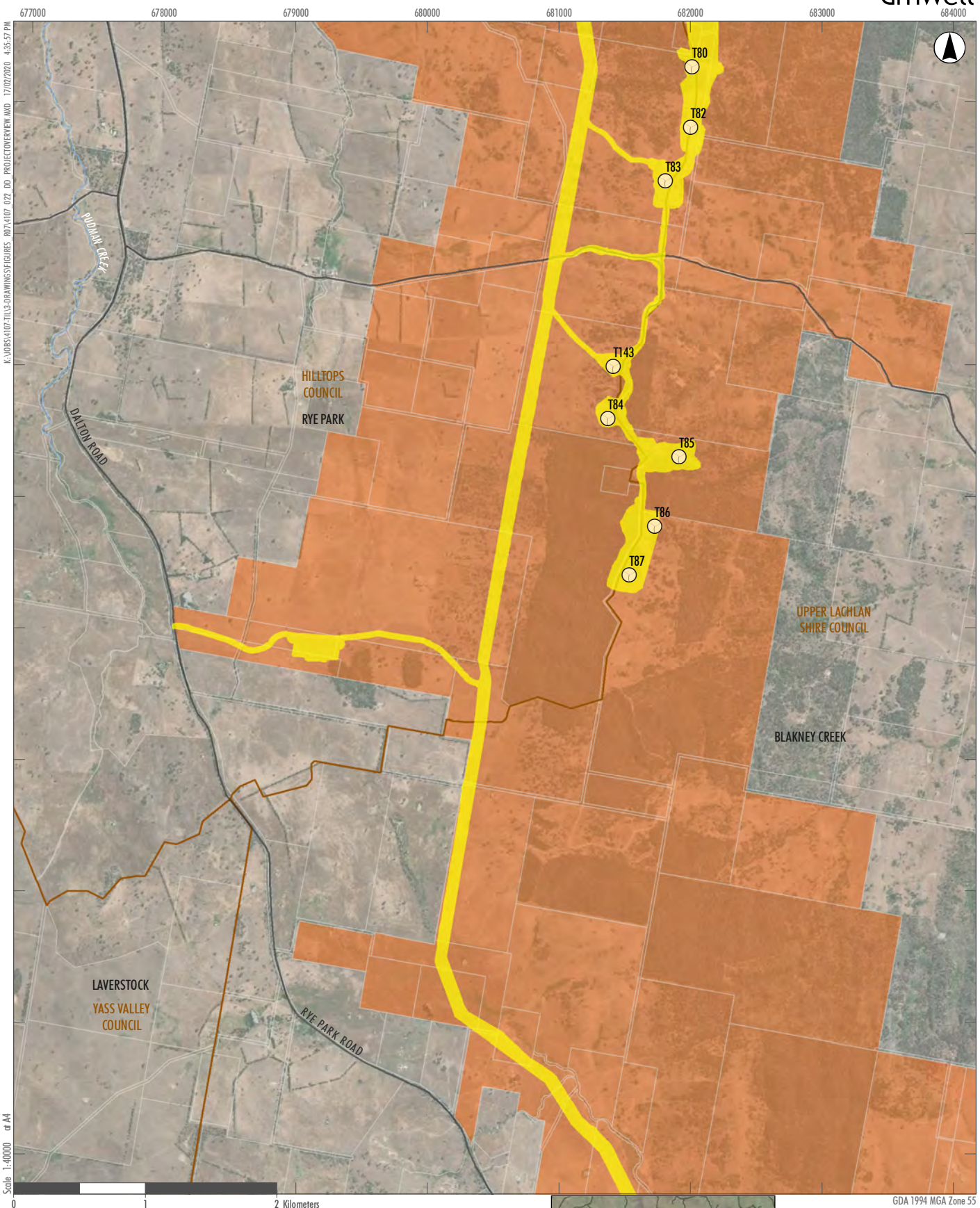
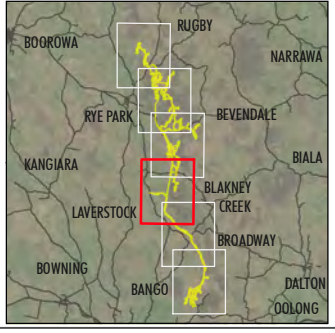


FIGURE 2.1.3

Location of Turbines to be Removed

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;





Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

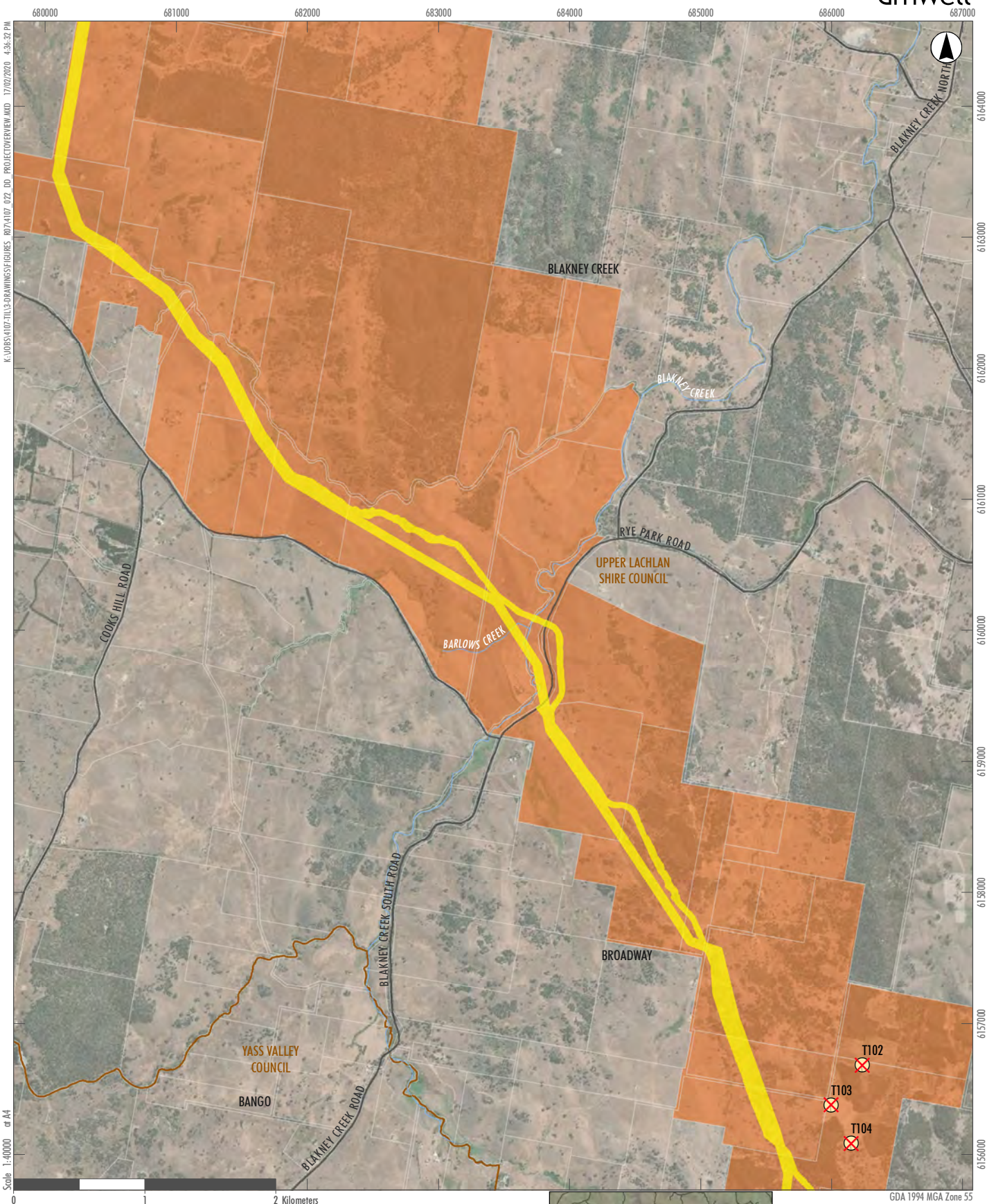
Previously Approved Turbine Locations

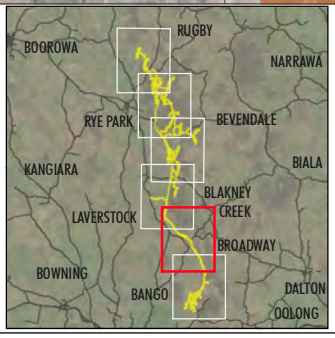
- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses

FIGURE 2.1.4

Location of Turbines to be Removed

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;





Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

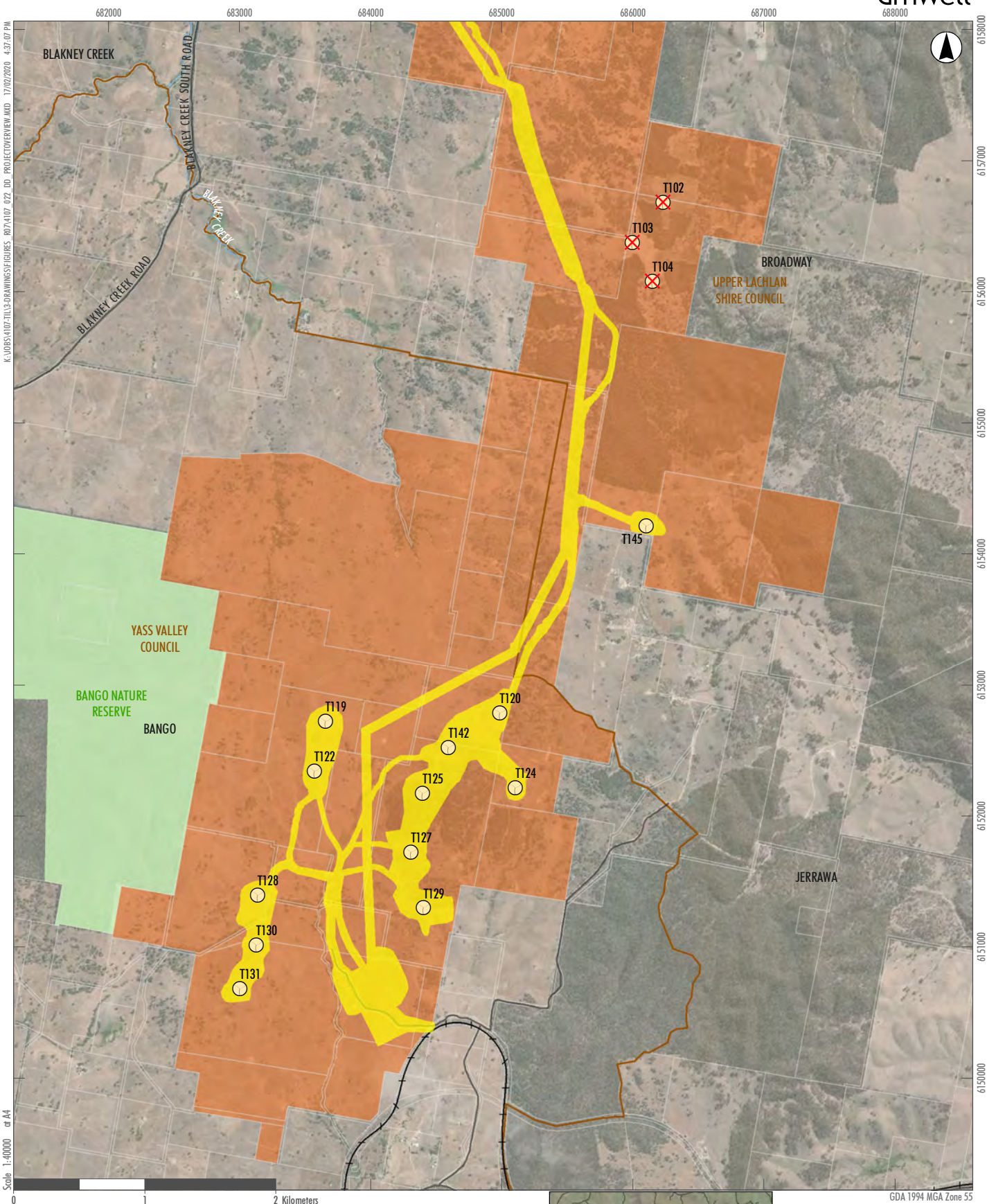
Previously Approved Turbine Locations

- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses

FIGURE 2.1.5

Location of Turbines to be Removed

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;



Legend

- Rye Park Wind Farm Modified Development Corridor
- Project Site

Previously Approved Turbine Locations

- Included in Modified Layout
- Excluded from Modified Layout
- Property Boundaries
- Watercourses
- NPWS Estate

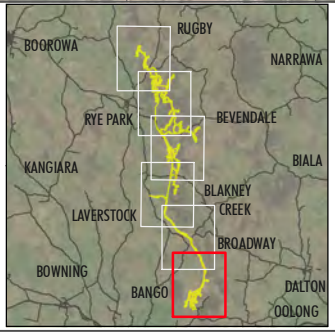


FIGURE 2.1.6

Location of Turbines to be Removed

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia;

3.0 Bird data summary and risk assessment

A summary of flight observations of the threatened and/or migratory species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or the NSW *Biodiversity Conservation Act 2016* (BC Act) recorded during extensive surveys in the Project Area (**Table 3.1**) is presented in **Section 3.1.1**.

The risk of blade strike under the current design and the proposed modification for these 14 species is discussed in **Section 3.1.2**.

Flight observation data of selected non-listed species are presented in **Section 3.2.1** and the risk of blade strike for these non-listed species under the current design and the proposed modification is presented in **Section 3.2.2**.

Table 3.1 Threatened and/or migratory listed bird species recorded in the Project Area

Species name	Scientific name	EPBC Act Status	BC Act Status
dusky woodswallow	*Artamus cyanopterus*	-	Vulnerable
brown treecreeper	*Climactris picumnus victoriae*	-	Vulnerable
varied sittella	*Daphoenositta chrysoptera*	-	Vulnerable
white-fronted chat	*Epthianura albifrons*	-	Vulnerable
black falcon	*Falco subniger*	-	Vulnerable
painted honeyeater	*Grantiella picta*	-	Vulnerable
little eagle	*Hieraaetus morphnoides*	-	Vulnerable
white-throated needletail	*Hirundapus caudacutus*	Vulnerable Migratory	-
hooded robin	*Melanodryas cucullata*	-	Vulnerable
flame robin	*Petroica phoenicea*	-	Vulnerable
scarlet robin	*Petroica boodang*	-	Vulnerable
superb parrot	*Polytelis swainsonii*	Vulnerable	Vulnerable
speckled warbler	*Pyrrholaemus sagittatus*	-	Vulnerable
diamond firetail	*Stagonopleura guttata*	-	Vulnerable

3.1 Threatened Species

3.1.1 Summary of flight observations

Of the 14 threatened species recorded in the Project Area, nine were observed flying on at least one occasion during Umwelt's 2018/19 surveys, and six were recorded flying between 25m and 200m above ground level (AGL) (**Table 3.2**, **Table 3.3**, **Table 3.4**).

Table 3.2 Number of observations of threatened species by flight height

Species name	Not flying	<10	10-19	20-29	30-39	40-59	60-79	80-99	100-149	150-199	200-249	250-299	>300
dusky woodswallow	10	0	2	0	0	2	2	1	0	0	0	0	0
varied sittella	2	0	3	3	0	0	0	0	0	0	0	0	0
white-fronted chat	42	9	9	7	8	11	0	0	0	0	0	0	0
black falcon	0	0	1	0	0	1	0	1	0	0	0	0	0
little eagle	0	0	0	0	0	0	1	0	0	1	0	0	0
painted honeyeater	0	2	1	0	0	0	0	0	0	0	0	0	0
white-throated needletail	0	0	0	0	2	7	4	1	0	1	1	0	0
hooded robin	2	1	0	0	0	0	0	0	0	0	0	0	0
flame robin	2	0	0	0	0	0	0	0	0	0	0	0	0
scarlet robin	36	2	2	0	0	0	0	0	0	0	0	0	0
superb parrot	8	5	7	4	4	2	0	0	0	0	0	0	0
speckled warbler	4	0	0	0	0	0	0	0	0	0	0	0	0
brown treecreeper	Flight behaviour/height not recorded (NGH 2014). Brown treecreeper are likely to only very rarely fly above 20m AGL.												
diamond firetail	Flight behaviour/height not recorded (NGH 2014). Diamond firetail are likely to only very rarely fly above 20m AGL.												

Table 3.3 Frequency of recorded flights above and below minimum RSA height

Species	# of flights ≤25m (%)	# of flights >25m (%)
dusky woodswallow	2 (29%)	5 (71%)
brown treecreeper	No flights recorded	No flights recorded
varied sittella	6 (100%)	0
white-fronted chat	25 (57%)	19 (43%)
black falcon	1 (33%)	2 (67%)
painted honeyeater	3 (100%)	0
little eagle	0	2 (100%)
white-throated needletail	0	16 (100%)
hooded robin	1 (100%)	0
flame robin	No flights recorded	No flights recorded
scarlet robin	4 (100%)	0
superb parrot	16 (73%)	6 (27%)
speckled warbler	No flights recorded	No flights recorded
diamond firetail	No flights recorded	No flights recorded

Table 3.4 Frequency of recorded flights above and below maximum RSA – existing design vs modification

Species name	Existing (157m AGL)		Modification (200m AGL)		Difference
	# of flights <160m (%)	# of flights ≥160m (%)	# of flights ≤200m (%)	# of flights >200m (%)	
little eagle	2 (100%)	0	2 (100%)	0	0
black falcon	3 (100%)	0	3 (100%)	0	0
white-throated needletail	15 (94%)	1 (6%)	16 (100%)	0	+1 (6%)

3.1.2 Comparative risk assessment

Blade strike risk overview

The proposed modification is likely to increase the risk for bird species that regularly fly at and above 30m AGL. For species that regularly fly below and occasionally fly above minimum RSA height (of both the existing design and the proposed modification) changes in risk resulting from a slight increase in minimum RSA height, a reduction in the number of turbines and a considerable increase in total RSA may have a combined positive, negative or negligible impact on overall risk of blade strike. Such species may be subject to higher risk under the proposed modification due to an increase in the total RSA, however could be concurrently subject to lower risk as a result of the removal of 12 turbines. The influence of changes to each of the four relevant factors of the modification on risk of blade strike to threatened bird species is examined with consideration of flight observations from the Project Area and external information in the following sections.

Unlikely to regularly occur above 30m AGL

The risk of blade strike to species that are very unlikely to occur above 30m AGL such as **hooded robin, speckled warbler, brown treecreeper** and **diamond firetail** (**Table 3.3**) is likely to remain stable as the risk is already very low under the existing design (**Table 3.5**).

Scarlet robin and **flame robin,** although observed perched in the majority of instances in the Project Area (during 90% and 100% of observations respectively), are likely to occasionally fly above minimum RSA height (30m AGL) during altitudinal movements through the landscape.

Similarly, whilst not recorded above 25m AGL in the Project Area **painted honeyeater** and **varied sittella** may occasionally approach and exceed minimum RSA height during flight (30m AGL). Flocks of varied sittella were observed flying between paddock trees at 20m AGL on 3 occasions (50% of all observations) and are likely to fly above 30m AGL at times given that the canopy height of trees in the Project Area ranges between 25-30m AGL in areas of box-gum woodland in particular. Whilst painted honeyeater were not recorded flying above 15m AGL in the Project Area (NGH 2014) this species is known to occasionally fly above 30m AGL during display flights and whilst dispersing through the landscape elsewhere in the region (pers. obs. M. Allen).

Scarlet robin, flame robin, painted honeyeater and **varied sittella** could be at slightly higher risk of blade strike due to the 49% increase in total RSA, but will concurrently be subject to slightly lower level of risk owing to the removal of 12 turbines.

The difference in risk to these four species between the existing design and the proposed modification is likely to be negligible.

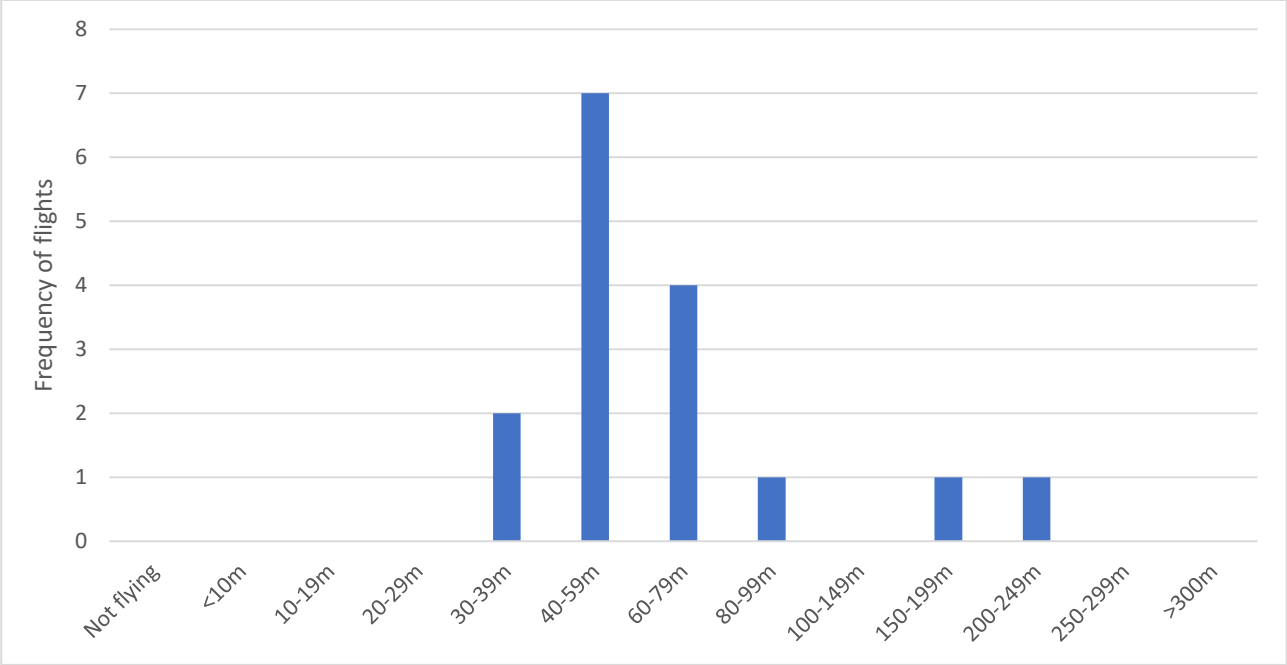
Frequently occur above 30m, occasionally occur below 30m

Species which fly far more frequently above 30m than below 30m such as **white-throated needletail, black falcon and little eagle** are likely to be placed at higher risk of blade strike under the proposed modification as a result of the 49% increase in the total RSA of the wind farm (**Table 3.5**).

In the case of **little eagle** and **black falcon,** both of which are uncommon visitors/residents which may occur overhead across any part of the Project Area, individuals utilising the airspace between 157-200m AGL are placed at risk of blade strike across a vertical zone 43m in width across a height band at which the risk of collision is not present under the existing design. The 3m increase in the minimum RSA height is likely to have a negligible on the level of risk to these two highly aerial raptors.

White-throated needletail were recorded on 16 occasions in the Project Area in flocks of up to 55 individuals flying between 30-200m AGL. The majority of white-throated needletail were observed between 40-80m AGL with 159/172 (92%) of individuals recorded in this height range (**Table 3.2**) (**Graph 3.1**).

The removal of the 12 turbines shown in **Figure 2.1** is likely to reduce risk of blade strike given that some of these turbines were located at higher elevation sites at or adjacent to the larger patches of woodland or forest in the Project Area, which corresponds to areas above which the majority of white-throated needletail were observed foraging or travelling N↔S through the landscape. Despite this the overall level of risk to this species is very likely to increase as a result of the modification due to the 49% increase in total RSA (**Table 3.5**). Furthermore, individuals utilising the airspace between 157-200m are placed at risk of blade strike as a result of the increase in maximum RSA height.



Graph 3.1 Frequency of white-throated needletail observations in each height class

<u>Regularly fly both above and below 30m</u>

The risk to species such as **superb parrot**, **dusky woodswallow** and **white-fronted chat** which regularly fly both below and above 30m AGL is likely to increase overall despite the removal of 12 turbines given the likely impact associated with a 49% increase in total RSA.

Superb parrot were recorded on 30 occasions during 2018/19 of which 22 observations were of birds in flight. A total of 4/22 (18%) of such observations were of individuals or flocks flying between 20-29m AGL, 4/22 (18%) at 30-39m AGL and 2/22 (9%) at 40-49m AGL whilst the remaining 12 flights (55%) were below 20m AGL (**Table 3.2**). The proposed removal of 12 turbines is unlikely to reduce risk to superb parrot given that this species was not recorded near such locations. The majority of turbines to be removed are located in the upper slopes and ridgetops of the Project Area. None are located in or near key foraging or breeding areas on the lower slopes of the Project Area.

The 3m increase in minimum RSA height is likely to have a negligible or minor influence on the risk to this species. The overall level of risk of blade strike to superb parrot is likely to increase as a result of the proposed modification (**Table 3.5**).

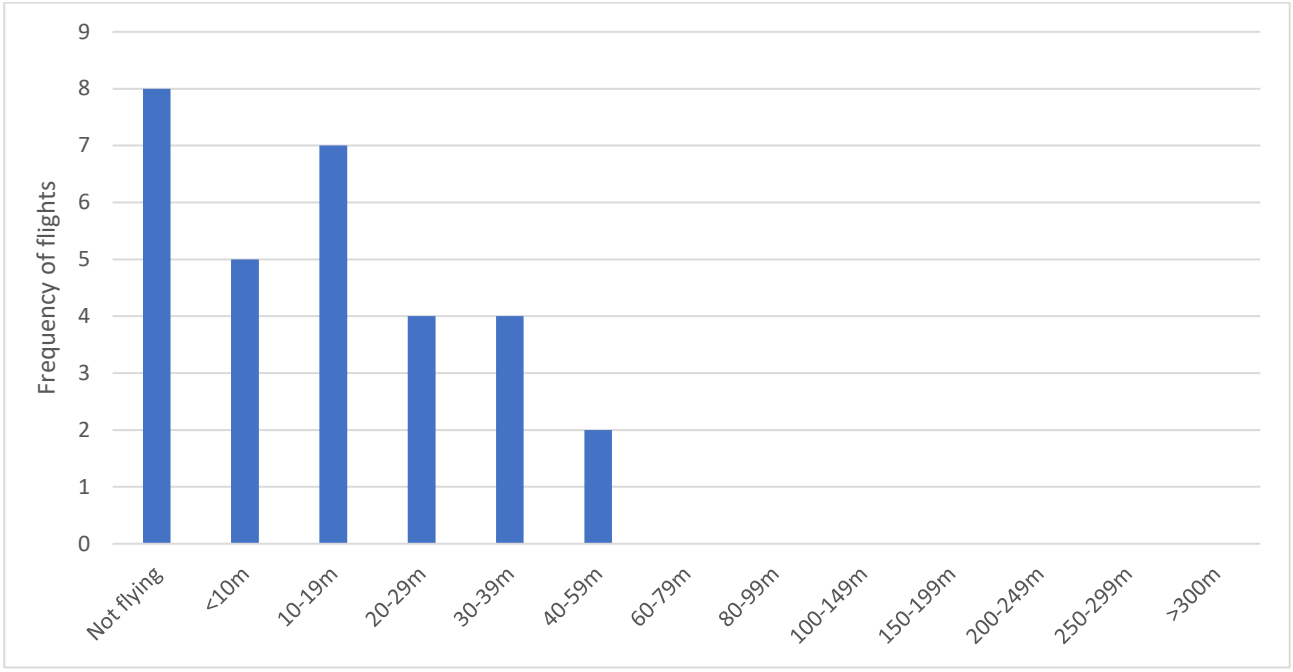
In the case of **dusky woodswallow**, a reduction in risk resulting from the removal of 12 turbines is unlikely to outweigh the risk associated with an increase in total RSA of 49% given that this species regularly utilises the airspace above 30m whilst dispersing and foraging. The majority of observations of dusky woodswallow flying in the Project Area (5/7 (71%)) were of flocks or individuals foraging between 40-100m AGL (**Table 3.2**) (**Graph 3.3**). The 3m increase in minimum RSA height is likely to have a negligible or minor influence on the risk to this species. The overall level of risk of blade strike to dusky woodswallow is likely to increase as a result of the proposed modification (**Table 3.5**).

Whilst **white-fronted chat** tend to spend a considerable amount of time foraging on the ground or in low shrubs (i.e. 42/86 (49%) observations) this species was regularly recorded flying at or above 30m AGL. On 8 occasions (18% of observed flights) individuals or flocks were recorded flying at between 30-39m AGL and on 11 occasions (25% of observed flights) they were recorded at between 40-49m AGL (**Table 3.2**) (**Graph 3.4**). The 3m increase in minimum RSA height is likely to have a negligible or minor influence on the risk to this species. Given the location of the 12 turbines proposed to be removed relative to the distribution of the white-fronted chat in the Project Area this aspect of the proposed modification is very likely to reduce the risk of blade strike to this species. However, the 49% increase in total RSA is likely to outweigh this factor resulting in an overall increase in the level of risk of blade strike to white-fronted chat.

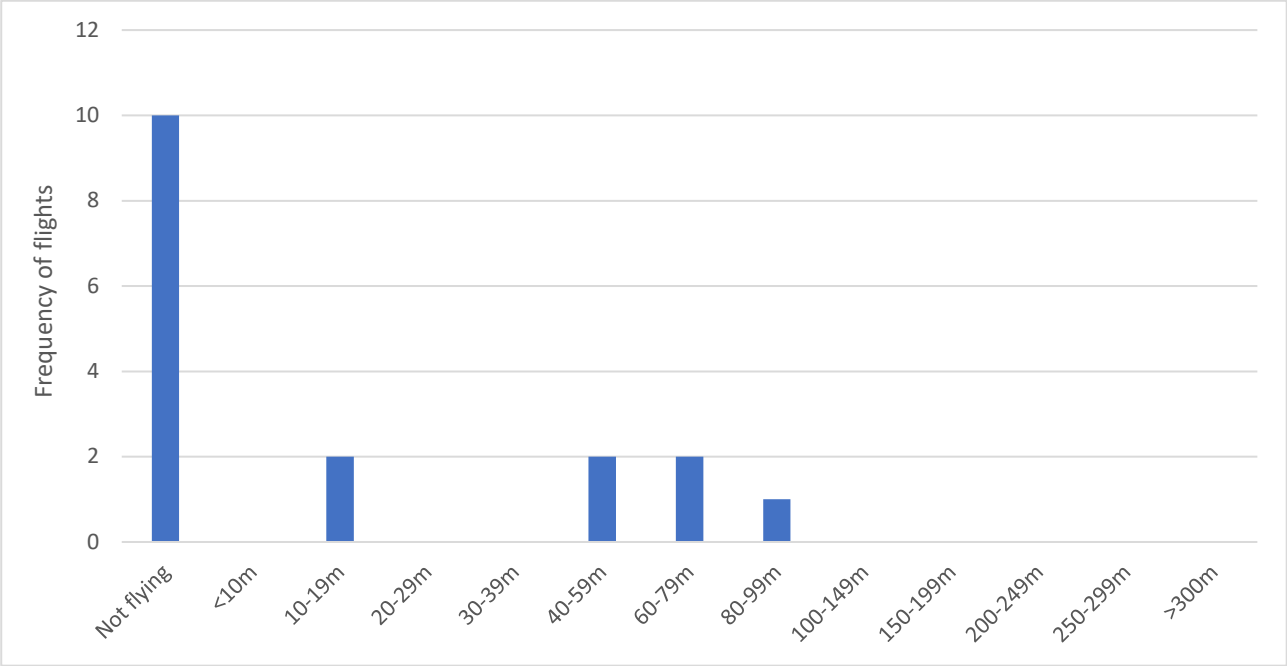
Summary

The proposed modification is likely to increase the risk of blade strike to white-throated needletail, little eagle, black falcon, superb parrot, dusky woodswallow and white-fronted chat and have little impact on the level of risk to hooded robin, speckled warbler, brown treecreeper, diamond firetail, scarlet robin, flame robin, painted honeyeater and varied sittella.

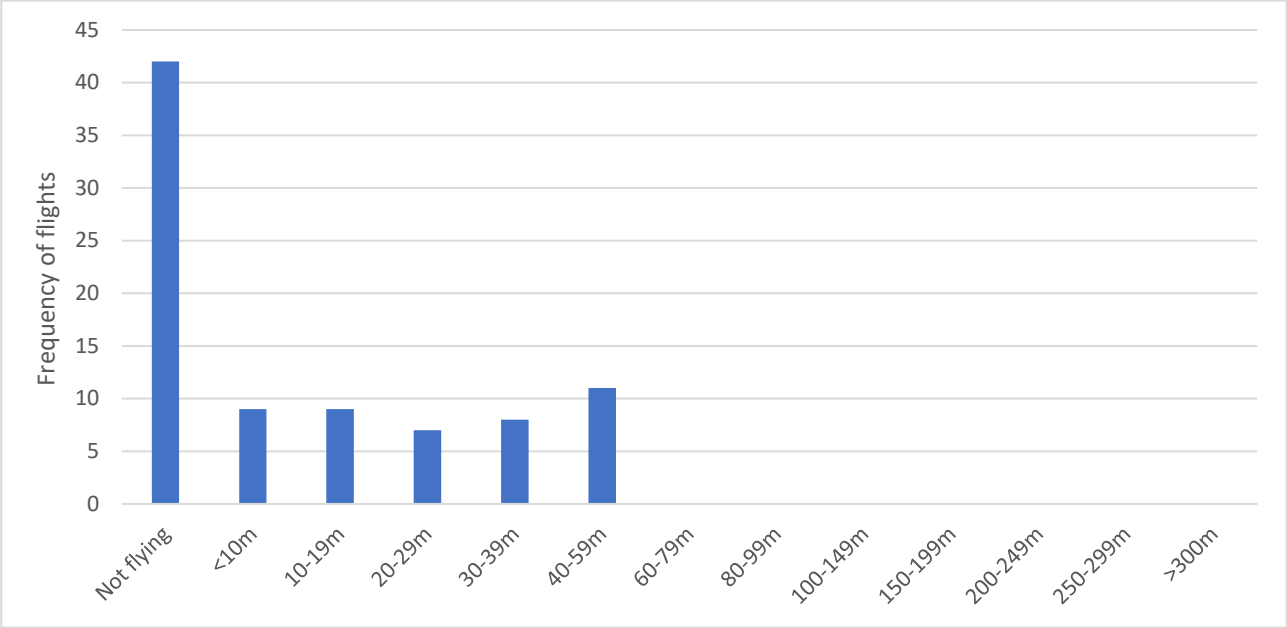
The proposed modification is unlikely to increase the level of risk to the extent that it would result in a significant adverse impact on any threatened birds listed under the EPBC Act and/or the BC Act based on the likely results of assessments of significance as presented in **Table 3.6** and **Table 3.7**.



Graph 3.2 Frequency of superb parrot observations in each height class.



Graph 3.3 Frequency of dusky woodswallow observations in each height class



Graph 3.4 Frequency of white-fronted chat observations in each height class

Table 3.5 Estimated relative risk trends relating to impact of changes to key factors of the proposed modification on risk of blade strike of threatened species
(↑ = increased risk, ↓ = decreased risk, ↔ = no change or highly uncertain)

Species name	Reduction of 12 turbines with a rotor diameter of 130m (RSA height of 27 to 157m AGL)	Increased maximum blade tip height by up to 43 metres from 157 to 200m AGL	Increased ground clearance by 3 metres from 27 to 30m AGL	An increase in total RSA by 595,276m^2 (49%)	Overall risk trend
dusky woodswallow	↓	↑	↔	↑	↑
varied sittella	↔	↔	↔	↔	↔
white-fronted chat	↓	↔	↔	↑	↑
black falcon	↓	↑	↔	↑	↑
painted honeyeater	↔	↔	↔	↔	↔
little eagle	↓	↑	↔	↑	↑
white-throated needletail	↓	↑	↔	↑	↑
hooded robin	↔	↔	↔	↔	↔
flame robin	↔	↔	↔	↔	↔
scarlet robin	↔	↔	↔	↔	↔
superb parrot	↔	↔	↔	↑	↑
speckled warbler	↔	↔	↔	↔	↔

Table 3.6 Test of significance summary - threatened bird species listed under the BC Act

	a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:		c. in relation to the habitat of a threatened species or ecological community:			d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
		i.is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction	ii.is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality		
dusky woodswallow	No	n/a	n/a	Negligible	No	Minor	No	No
white-fronted chat	No	n/a	n/a	Negligible	No	Minor	No	No
black falcon	Potential. Given the low density of this species in the landscape instances of blade strike may be significant at the local population scale.	n/a	n/a	Negligible	No	Uncertain	No	No
little eagle	Potential. As above.	n/a	n/a	Negligible	No	Uncertain	No	No
superb parrot	No	n/a	n/a	Negligible	No	Minor	No	No

Table 3.7 Test of significance summary - vulnerable bird species listed under the EPBC ACT

	a. lead to a long-term decrease in the size of an important population of a species	b. reduce the area of occupancy of an important population	c. fragment an existing important population into two or more populations	d. adversely affect habitat critical to the survival of a species	e. disrupt the breeding cycle of an important population	f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	h. introduce disease that may cause the species to decline	i. interfere substantially with the recovery of the species
superb parrot	No	No	No	No	No	No	No	No	No
white-throated needletail	No	No	No	No	No	No	No	No	No

3.2 Non-threatened bird species

3.2.1 Summary of flight observations

A summary of the number of observations of birds in flight above and below minimum RSA height for select raptors, waterbirds, other non-passerines and passerines recorded flying above 25m AGL in the Project Area is presented in **Table 3.8**.

A summary of the number of observations of wedge-tailed eagle below and above the maximum blade tip height of the existing design and the proposed modification is presented in **Table 3.9**.

Table 3.8 Frequency of recorded flights above and below minimum RSA (non-threatened species recorded at >25m AGL)

Species name	# of flights ≤25m (%)	# of flights >25m (%)
Raptors		
brown goshawk (*Accipiter fasciatus*)	2 (40%)	3 (60%)
wedge-tailed eagle (*Aquila audax*)	6 (5%)	115 (90%)
collared sparrowhawk (*Accipiter cirrocephalus*)	1 (33%)	2 (67%)
brown falcon (*Falco berigora*)	2 (40%)	3 (60%)
nankeen kestrel (*Falco cenchroides*)	18 (45%)	22 (55%)
Australian hobby (*Falco longipennis*)	0	1 (100%)
peregrine falcon (*Falco peregrinus*)	1 (33%)	2 (67%)
whistling kite (*Haliastur sphenurus*)	0	3 (100%)
black kite (*Milvus migrans*)	0	1 (100%)
Waterbirds		
Pacific black duck (*Anas superciliosa*)	0	1 (100%)
white-faced heron (*Egretta novaehollandiae*)	4 (57%)	3 (43%)
nankeen night-heron (*Nycticorax caledonicus*)	0	1 (100%)
straw-necked ibis (*Threskiornis spinicollis*)	0	2 (100%)
Other non-passerines		
sulphur-crested cockatoo (*Cacatua galerita*)	24 (37%)	41 (63%)
yellow-tailed black-cockatoo (*Calyptorhynchus funereus*)	0	1 (100%)
little corella (*Cacatua sanguinea*)	1 (50%)	1 (50%)
galah (*Eolophus roseicapilla*)	99 (68%)	46 (32%)
blue-winged parrot (*Neophema chrysostoma)*	0	1 (100%)
red-rumped parrot (*Psephotus haematonotus*)	1 (50%)	1 (50%)
Passerines		
rainbow bee-eater (*Merops ornatus*)	4 (33%)	8 (67%)
Australasian pipit (*Anthus novaseelandiae*)	11 (69%)	5 (31%)
spotted pardalote (*Pardalotus punctatus*)	4 (25%)	12 (75%)
striated pardalote (*Pardalotus striatus*)	5 (42%)	7 (58%)

Species name	# of flights ≤25m (%)	# of flights >25m (%)
yellow-faced honeyeater (*Caligavis chrysops*)	28 (78%)	8 (22%)
white-eared honeyeater (*Nesoptilotis leucotis*)	29 (97%)	1 (3%)
black-faced cuckoo-shrike (*Coracina novaehollandiae*)	21 (84%)	4 (16%)
red wattlebird (*Anthochaera carunculata*)	53 (95%)	3 (5%)
noisy friarbird (*Philemon corniculatus*)	14 (93%)	1 (7%)
silvereye (*Zosterops lateralis*)	7 (37%)	12 (63%)
white-browed woodswallow (*Artamus superciliosus*)	1 (14%)	6 (86%)
masked woodswallow (*Artamus personatus*)	2 (25%)	6 (75%)
Australian raven (*Corvus coronoides*)	16 (50%)	16 (50%)
little raven (*Corvus mellori*)	4 (40%)	6 (60%)
grey butcherbird (*Cracticus torquatus*)	6 (86%)	1 (14%)
Australian magpie (*Gymnorhina tibicen*)	73 (82%)	16 (18%)
pied currawong (*Strepera graculina*)	12 (92%)	1 (8%)
magpie-lark (*Grallina cyanoleuca*)	14 (88%)	2 (12%)
common starling (*Sturnus vulgaris*)	52 (84%)	10 (16%)
welcome swallow (*Hirundo neoxena*)	21 (68%)	10 (32%)

Table 3.9 Frequency of recorded wedge-tailed eagle flights above and below maximum RSA – existing design vs modification

Species name	Existing (157m)		Modification (200m)		Difference
	# of flights <160m (%)	# of flights ≥160m (%)	# of flights ≤200m (%)	# of flights >200m (%)	
wedge-tailed eagle	76 (63%)	45 (37%)	96 (79%)	25 (21%)	+20 (+17%)

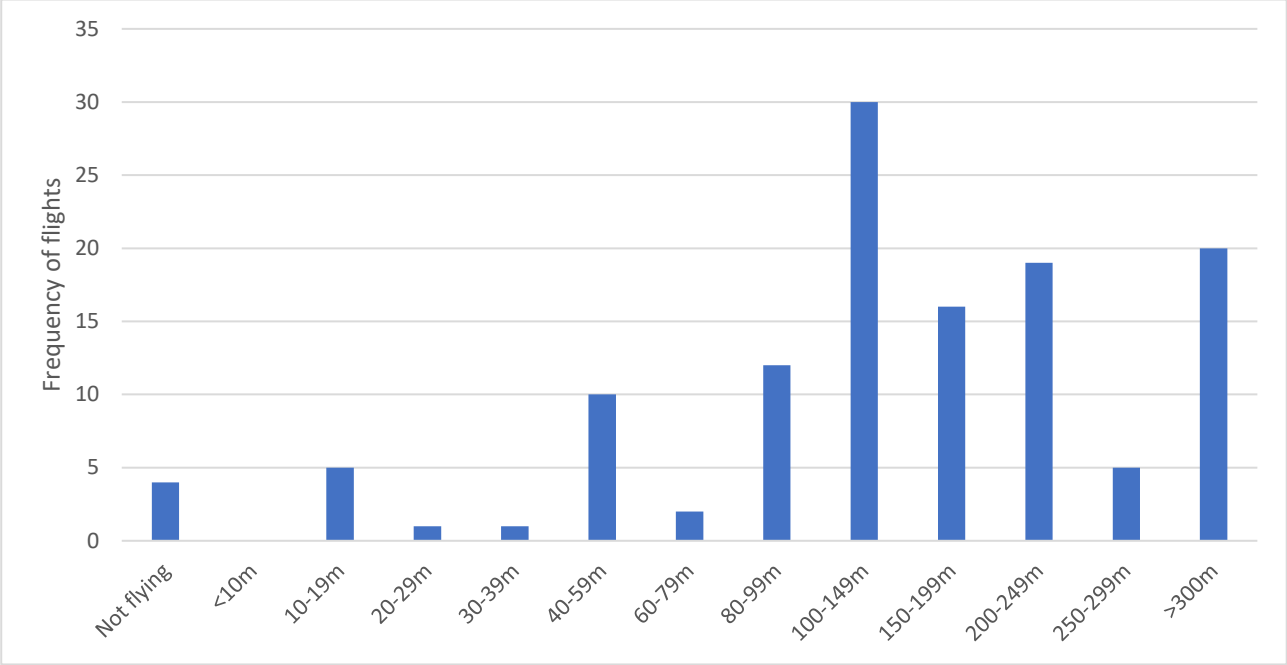
3.2.2 Comparative risk assessment

Wedge-tailed eagle

Wedge-tailed eagle were observed across the majority of the elevated areas of the Project Area and were recorded in flight on 121 occasions during the 2018/19 surveys. Observed flights were almost exclusively of individuals or pairs soaring, displaying or circling above 40m AGL (92% of observations). The proportion of flights recorded at RSA height varied between the existing design and the proposed modification. A total of 71 flights (58%) were recorded between 27-157m whilst a total of 90 flights (74%) were recorded between 30-200m (**Table 3.9**).

The increase in minimum RSA height from 27 to 30m AGL is likely to have little influence on risk of blade strike to this species whilst the increase in maximum RSA height from 157 to 200m AGL results in a greater number of flights being placed at risk. As a standalone factor the removal of 12 turbines would reduce risk of blade strike given that wedge-tailed eagle were either observed flying at RSA height at or are very likely to fly at these locations.

Overall, the level of risk of blade strike is very likely to increase due to the 49% increase in total RSA within a height range that wedge-tailed eagle frequently occur in (**Graph 3.5**) (**Table 3.10**). The majority of other raptors recorded in the Project Area are also likely to be at higher risk of blade strike under the modification due the 49% increase in the total RSA of the wind farm (**Table 3.10**).



Graph 3.5 Frequency of wedge-tailed eagle observations in each height class

Aerial nomads / migrants

The risk of blade strike to highly aerial nomads and migrants which often flock and move through the landscape above 50m AGL such as **masked woodswallow**, **white-browed woodswallow** and **rainbow bee-eater** is likely to increase due to the 49% increase in total RSA across a height range that these species frequently occur in. The majority of observations of masked woodswallow (6/8 (75%)), white-browed woodswallow (5/7 (71%)) and rainbow bee-eater (8/12 (67%)) in flight in the Project Area were of flocks flying between 30-150m AGL.

Other non-threatened species

Common resident species such as **sulphur-crested cockatoo, galah, Australian magpie** and **Australian raven** are also likely to be at higher risk under the modification due to the 49% in total RSA area (**Table 3.10**). Sulphur-crested cockatoo, galah, Australian magpie and Australian raven were recorded flying at or above 30m AGL during 41/65 (63%), 46/145 (32%),16/89 (18%) and 16/32 (50%) observed flights respectively (**Table 3.8**).

Common small passerines such as **striated pardalote**, **spotted pardalote** and **silvereye** were regularly recorded flying during migration below, above and very near to the height of the minimum RSA height of both the existing design and the modification (**Table 3.8**). The average observed flight height in the Project Area for striated pardalote, spotted pardalote and silvereye whilst migrating was 39.6m, 35.5m and 36.2m. For these migratory species an increase in the risk associated with a 49% increase in RSA is likely to outweigh the likely reduction in risk resulting from the removal of 12 turbines (**Table 3.10**). The risk of blade strike to **red wattlebird, yellow-faced honeyeater, magpie-lark, pied currawong** and **Australasian pipit** may potentially increase as a result of the 49% increase in total RSA (**Table 3.10**) whilst for **white-eared honeyeater** the overall risk may be reduced (**Table 3.10)**.

Summary

The majority of species which were recorded flying above 25m AGL in the Project Area are likely to be placed at higher risk of blade strike under the proposed modification largely due to the 49% increase in the total RSA of the project.

Table 3.10 Estimated relative risk trends relating to impact of changes to key factors of the proposed modification on risk of blade strike on selected non-threatened species recorded flying above 25m AGL (↑ = increased risk, ↓ = decreased risk, ↔ = no change or highly uncertain)

Species name	Reduction of 12 turbines with a rotor diameter of 130m (RSA height of 27 to 157m AGL)	Increased maximum blade tip height by up to 43 metres from 157 to 200m AGL	Increased ground clearance by 3 metres from 27 to 30m AGL	An increase in total RSA by 595,276m^2 (49%)	Overall risk trend
Raptors					
wedge-tailed eagle	↓	↑	↔	↑	↑
brown falcon	↓	↑	↔	↑	↑
nankeen kestrel	↓	↔	↔	↑	↑
brown goshawk	↓	↑	↔	↑	↑
collared sparrowhawk	↓	↔	↔	↑	↑
peregrine falcon	↓	↑	↔	↑	↑
Australian hobby	↓	↑	↔	↑	↑
Common resident species					
sulphur-crested cockatoo	↓	↔,↑	↔	↑	↑
galah	↓	↔	↔	↑	↑
Australian raven	↓	↔,↑	↔	↑	↑

Species name	Reduction of 12 turbines with a rotor diameter of 130m (RSA height of 27 to 157m AGL)	Increased maximum blade tip height by up to 43 metres from 157 to 200m AGL	Increased ground clearance by 3 metres from 27 to 30m AGL	An increase in total RSA by 595,276m^2 (49%)	Overall risk trend
Australian magpie	↓	↔	↔	↑	↑
pied currawong	↓	↔	↔	↔,↑	↔,↑
Australasian pipit	↓	↔	↔	↑	↑
magpie-lark	↓	↔	↔	↔, ↑	↔,↑
Migratory, partially migratory or nomadic passerines					
rainbow bee-eater	↓	↑	↔	↑	↑
yellow-faced honeyeater	↓	↔	↔	↑	↑
white-eared honeyeater	↓	↔	↔	↔	↔,↓
noisy friarbird	↓	↔	↔	↔, ↑	↔,↑
red wattlebird	↓	↔	↔	↔, ↑	↔,↑
silvereye	↓	↔	↔	↑	↑
striated pardalote	↓	↔	↔	↑	↑
spotted pardalote	↓	↔	↔	↑	↑
white-browed woodswallow	↓	↑	↔	↑	↑
masked woodswallow	↓	↑	↔	↑	↑

4.0 Bat data summary and risk assessment

A summary of records of threatened bat species listed under the EPBC Act and/or the BC Act and non-threatened species recorded in the Project Area (**Table 4.1**) is presented in **Sections 4.1.1** and **Section 4.2.1** respectively.

No microbats listed under the EPBC Act were recorded in the Project Area. The estimated risk of blade strike under the current design and the proposed modification for threatened species and non-threatened species is discussed in **Sections 4.1.2** and **4.2.2** respectively.

Table 4.1 Status of bat species recorded in the Project Area

Species name	Scientific name	EPBC Act Status	BC Act Status
large bent-winged bat	*Miniopterus orianae oceanensis*	-	Vulnerable
eastern false pipistrelle	*Falsistrellus tasmaniensis*	-	Vulnerable
yellow-bellied sheathtail bat	*Saccolaimus flaviventrus*	-	Vulnerable
southern myotis	*Myotis macropus*	-	Vulnerable

Microbat calls were monitored at a total of 29 locations in the Project Area, comprising 23 ground-based sites at which bat detectors were deployed at 2m AGL, and 6 elevated sites at which bat detectors were deployed at 45m AGL between November 2018 and April 2019. Maximum recording range of the microphones used is assumed to be 30m however recording range can be influenced by a range of variables such as weather conditions and varies markedly between certain microbat species.

4.1 Threatened bat species

4.1.1 Summary of records

The number of definite and probable calls of each threatened species recorded in the Project Area and the mean number of individual calls per unit per night are presented in **Table 4.2**.

Table 4.2 Summary of calls of threatened bat species recorded in the Project Area during 2018/19

Species name	Number of recorded calls at 2m AGL	Mean number of calls / unit / night recorded at 2m AGL	Number of recorded calls at 45m AGL	Mean number of calls / unit / night recorded at 45m AGL
large bent-winged bat	3	0.01	0	0
eastern false pipistrelle	1	<0.01	0	0
yellow-bellied sheathtail bat	10	0.02	4	<0.01
southern myotis	1	<0.01	0	0

Note that bat calls classified as either ‘definite’ or ‘probable’ by the microbat call expert are treated in this report as valid records whilst calls classified as ‘possible’ are not.

A high number of possible large bent-winged bat calls were not identified to species level due to difficulty in confidently differentiating their calls from that of *Vespadalus*. spp. (**Table 4.3**). Such calls should be treated as possibly being large bent-winged bat calls. The number of such calls recorded and the mean number of calls per bat detector per night during 5 November 2018 to 20 March 2019 and during the migration period (24 March to 10 April) is presented in **Table 4.4**.

Table 4.3 Summary of possible large bent-winged bat calls which could not be identified to species level with a high level of confidence

Species group	Number of recorded calls at 2m AGL	Mean number of calls / unit / night recorded at 2m AGL	Number of recorded calls at 45m AGL	Mean number of calls / unit / night recorded at 45m AGL
Miniopterus orianae oceanensis / Vespadelus darlingtoni / V. regulus / V. vulturnus	48997	11.21	46	0.12
Miniopterus o. oceanensis / V. regulus	11	0.02	0	0
Miniopterus o. oceanensis / V. regulus / V. vulturnus	10244	23.96	67	0.17
Miniopterus o. oceanensis / V. vulturnus	8775	24.85	36	0.09

Table 4.4 Summary of possible large bent-winged bat calls recorded prior to (9 November 2018 – 19 March 2019) and during the large bent-winged bat migration period (24 March – 10 April)

Species group	Number of recorded calls at 2m AGL	Mean number of calls / unit / night recorded at 2m AGL	Number of recorded calls at 45m AGL	Mean number of calls / unit / night recorded at 45m AGL
Pre large bent-winged bat migration period (9 November 2018 – 19 March 2019)				
Miniopterus orianae oceanensis / Vespadelus darlingtoni / V. regulus / V. vulturnus	3662	6.24	46	0.17
Miniopterus o. oceanensis / V. regulus	11	0.02	0	-
Miniopterus o. oceanensis / V. regulus / V. vulturnus	8731	14.87	67	0.24
Miniopterus o. oceanensis / V. vulturnus	7640	13.02	35	0.13
Large bent-winged bat migration period (24 March – 10 April 2019)				
Miniopterus orianae oceanensis / Vespadelus darlingtoni / V. regulus / V. vulturnus	1222	8.37	0	-
Miniopterus o. oceanensis / V. regulus	0	0	0	-
Miniopterus o. oceanensis / *V. regulus / V. vulturnus*	1481	10.14	0	-
Miniopterus o. oceanensis / V. vulturnus	1117	7.65	0	-

4.1.2 Comparative risk assessment

The difference in the level of risk of blade strike to **large bent-winged bat** under the existing design versus the proposed modification is uncertain. Only three definite large bent-winged bat calls were recorded during the 2019 migration period each of which were from ground level at a site in the far southern section (BGI02) of the Project Area. Additionally, no potential large bent-winged bat calls were recorded from 45m AGL during the migration period (**Table 4.4**) though over 100 were recorded prior to the migration period.

A 49% increase in total RSA would increase the risk to individuals flying above 30m AGL but the number of flights above this height appears to be low. The proposed modification may have a negligible effect or possibly increase the risk of blade strike to large bent-winged bat however there is a particularly high level of uncertainty associated with this estimate (**Table 4.7**).

A total of ten and four **yellow-bellied sheathtail bat** calls were recorded from 45m AGL and 2m AGL respectively. This species may be placed at higher risk of blade strike under the modification as a result of the 49% increase in total RSA. **Eastern false pipistrelle** was recorded once in the Project Area, from a ground-level site (BGIRP8) located in the central section of the Project Area. It is uncertain whether the proposed modification will increase, reduce or have a negligible effect on risk of blade strike on this species. A possible **southern myotis** call was recorded by a ground-based unit at BGIRP6 in the north-western section of the Project Area 150m from the nearest water body.

Summary

The proposed modification may increase the risk of blade strike to large bent-winged bat and yellow-bellied sheathtail bat. The proposed modification is unlikely to increase the level of risk to these species to the extent that it would result in a significant adverse impact based on the likely results of assessments of significance as presented in **Table 4.5**.

Table 4.5 Test of significance summary - threatened bat species listed under the BC Act

	a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:		c. in relation to the habitat of a threatened species or ecological community:			d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
		i.is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction	ii.is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality		
large bent-winged bat	No	n/a	n/a	n/a	No	n/a	No	No
yellow-bellied sheathtail bat	No	n/a	n/a	n/a	No	n/a	No	No

4.2 Non-threatened bat species

4.2.1 Summary of records

The number of calls of each non-threatened species and the mean number of calls per bat detector per night are presented in **Table 4.6**.

Table 4.6 Summary of calls of non-threatened bat species recorded in the Project Area during 2018/19

Species name	Number of recorded calls at 2m AGL	Mean number of calls / unit / night recorded at 2m AGL	Number of recorded calls at 45m AGL	Mean number of calls / unit / night recorded at 45m AGL
white-striped free-tailed bat (*Austronomus australis*)	27912	26.78	11740	29.06
Gould's wattled bat (*Chalinolobus gouldii*)	2487	4.68	76	0.19
chocolate wattled bat (*Chalinolobus morio*)	592	0.80	2	<0.01
inland free-tailed bat (*Mormopterus petersi*)	6	0.04	2	<0.01
southern free-tailed bat (*Mormopterus planiceps*)	2648	4.80	652	1.63
inland broad-nosed bat (*Scotorepens balstoni*)	40	0.05	17	0.04
little forest bat (*Vespadelus vulturnus*)	4836	10.96	46	0.12

4.2.2 Comparative risk assessment

White-striped free-tailed bat was the most commonly recorded species in the Project Area. It was detected at all 29 survey locations and was regularly recorded from 45m AGL. The level of risk of blade strike is very likely to increase as a result of the modification due to the 49% increase in total RSA within a height range that white-striped free-tailed bat frequently occur (**Table 4.7**).

Gould's wattled bat, inland free-tailed bat, southern free-tailed bat and **inland broad-nosed bat** may also be placed at higher risk of blade strike as a result of the 49% increase in total RSA whilst **chocolate wattled bat** and **little forest bat** may or may not be placed at higher risk of blade strike under the proposed modification than the existing design.

Table 4.7 Estimated relative risk trends relating to impact of changes to key factors of the proposed modification on risk of blade strike on all bat species recorded in the Project Area (↑ = increased risk, ↓ = decreased risk, ↔ = no change or highly uncertain)

Species name	Reduction of 12 turbines with a rotor diameter of 130m (RSA height of 27 to 157m AGL)	Increased maximum blade tip height by up to 43 metres from 157 to 200m AGL	Increased ground clearance by 3 metres from 27 to 30m AGL	An increase in total RSA by 595,276m^2 (49%)	Overall risk trend
Threatened species					
large bent-winged bat	↓	↔,↑	↔	↑	↔,↑
eastern false pipistrelle	↓	↔	↔	↔,↑	↔
yellow-bellied sheathtail bat	↓	↔	↔	↑	↔,↑
southern myotis	↓	↔	↔	↔	↔,↓
Non-threatened species					
white-striped free-tailed bat	↓	↔,↑	↔	↑	↑
Gould's wattled bat	↓	↔	↔	↑	↑
chocolate wattled bat	↓	↔	↔	↔,↑	↔,↑
inland free-tailed bat	↓	↔	↔	↑	↑
southern free-tailed bat	↓	↔	↔	↑	↑
inland broad-nosed bat	↓	↔	↔	↑	↑
little forest bat	↓	↔	↔	↑	↔,↑

5.0 Conclusion

Birds

The proposed modification is very likely to increase the risk of blade strike for certain species which regularly occur above 30m AGL in the Project Area.

Wedge-tailed eagle, little eagle, black falcon and white-throated needletail in particular are likely to be placed at greater risk of blade strike as a result of the 49% increase in the total RSA of the wind farm under the proposed modification. Other highly aerial species or groups of species such as white-browed woodswallow, masked woodswallow, rainbow bee-eater and all raptors present in the Project Area are also likely to be at higher risk of blade strike under the proposed modification.

Threatened species known to occasionally or regularly occur above 30m AGL in the Project Area such as superb parrot, dusky woodswallow and white-fronted chat are likely to be at higher risk of blade strike under the proposed modification. For threatened species which rarely occur above 20m AGL such as hooded robin, diamond firetail, brown treecreeper and speckled warbler or species that occasionally do such as varied sittella, flame robin, scarlet robin, painted honeyeater the difference in blade strike risk between the existing design and the proposed modification is likely to be negligible as there is a very low risk of blade strike under both scenarios.

The proposed modification is unlikely to increase the level of risk of blade strike to the extent that it would result in a significant adverse impact on any threatened birds listed under the EPBC Act and/or the BC Act.

A suite of non-threatened migrants, partial migrants and sedentary species including silvereye, spotted pardalote, striated pardalote, yellow-faced honeyeater, galah, sulphur-crested cockatoo, Australian magpie and Australian raven are also likely to be negatively impacted by the 49% increase in total RSA to the extent that this factor will likely outweigh the reduction in risk resulting from the removal of 12 turbines.

Bats

White-striped free-tailed bat is very likely to be placed at higher risk of blade strike as a result of the 49% increase in the total RSA of the wind farm under the proposed modification. Gould's wattled bat, inland free-tailed bat, southern free-tailed bat and inland broad-nosed bat are also likely to be at greater risk of blade strike under the proposed modification whilst the level of risk of blade strike to large bent-winged bat, yellow-bellied sheathtail-bat, chocolate wattled bat and little forest bat may be similar or slightly higher than the level of risk posed by the current design.

The proposed modification is unlikely to increase the level of risk of blade strike to the extent that it would result in a significant adverse impact on any threatened bats listed under the BC Act. No bats listed under the EPBC Act have been recorded in the Project Area.

Summary

Overall the changes in the components of the wind farm design and/or turbine specifications which differentiate the proposed modification from the existing design are likely to generally influence the risk of blade strike as follows:

- the reduction in the number of turbines will reduce the risk to species that occur at such locations and fly at RSA height

- the 3m increase in minimum RSA height is likely to have a negligible or minor effect on the risk of blade strike to species which occur both above and below this height

- the increase in maximum RSA height will increase the vertical range in which a few highly aerial species, particularly wedge-tailed eagle and white-throated needletail, are at risk of blade strike, and

- the 49% increase in the total RSA of the wind farm is likely to increase risk to a certain suite of species which either occur occasionally, regularly or almost exclusively above 30m AGL.

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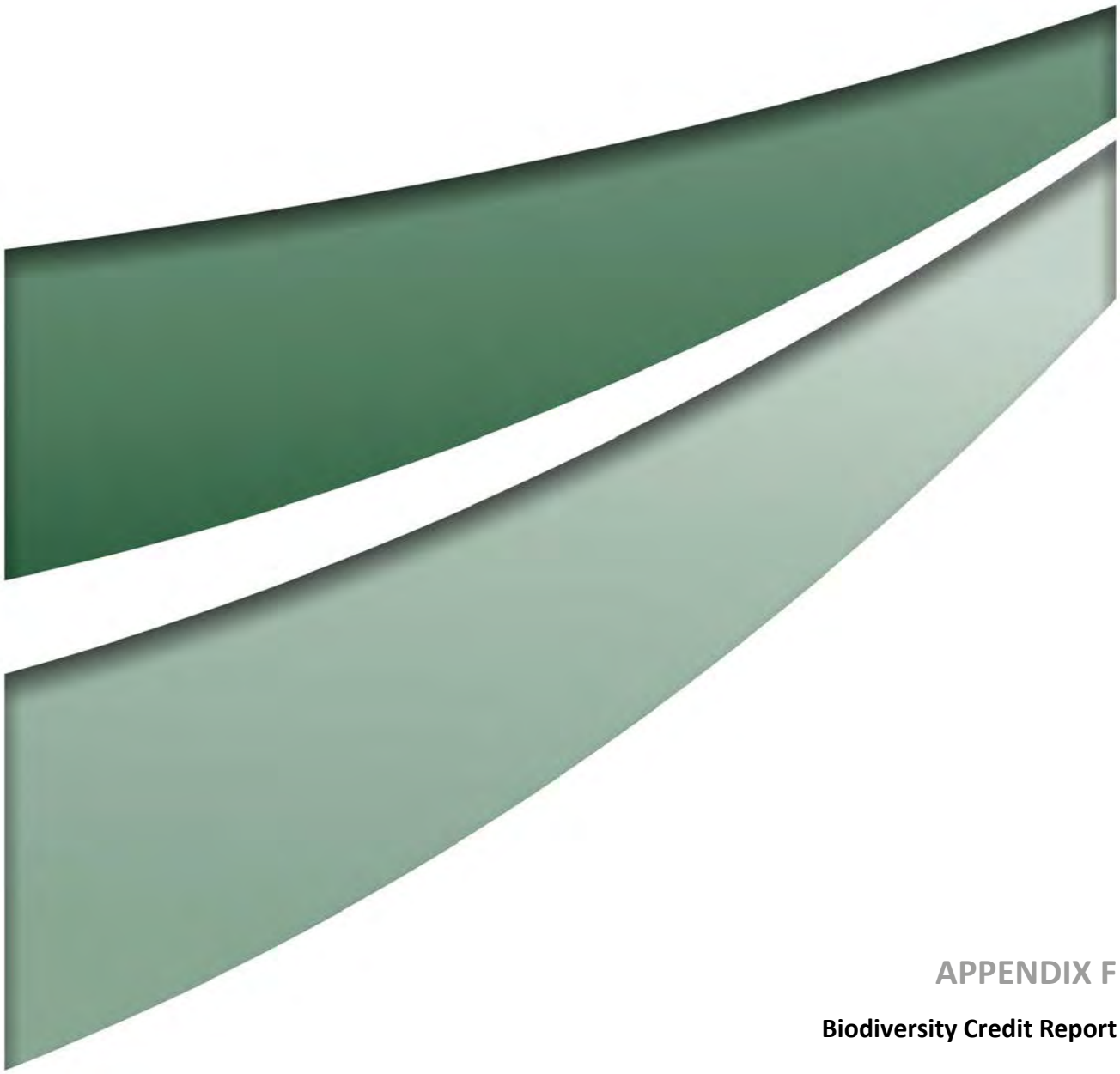

APPENDIX F

Biodiversity Credit Report

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00010359/BAAS17068/18/00012902

Proposal Name
Rye Park SWS IBRA

BAM data last updated *
26/11/2019

Assessor Name
Bill Wallach

Assessor Number
BAAS17068

BAM Data version *
22

Proponent Names

Report Created
25/03/2020

BAM Case Status
Open

Assessment Revision
3

Assessment Type
Major Projects

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion

Species
Synemon plana / Golden Sun Moth
Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Predicted Threatened Species Not On Site

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Not a TEC	1.1	34.00
335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Not a TEC	7.6	202.00
350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	24.8	558.00
351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	Not a TEC	255.4	3818.00

289-Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Upper Riverina Dry Sclerophyll Forests This includes PCT's: 269, 285, 289, 290, 298, 302, 304, 314, 338, 340, 342, 353, 1088, 1094, 1095	Upper Riverina Dry Sclerophyll Forests >=50% and <70%	Yes	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Floodplain Swamps This includes PCT's: 66, 204, 205, 335, 360, 447, 465, 1291	Inland Floodplain Swamps >=70% and <90%	No	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	Yes	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

	Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	Yes	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Area	Credits
Delma impar / Striped Legless Lizard	3.6	34.00
Myotis macropus / Southern Myotis	0.1	3.00
Petaurus norfolcensis / Squirrel Glider	64.9	2188.00
Polytelis swainsonii / Superb Parrot	9.8	292.00
Synemon plana / Golden Sun Moth	12.3	238.00

Delma impar/ Striped Legless Lizard	351_DNG	**Like-for-like credit retirement options**	
		Spp	IBRA region

		Delma impar/Striped Legless Lizard	Any in NSW
Myotis macropus/ Southern Myotis	350_Moderate	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
Petaurus norfolcensis/ Squirrel Glider	289_ModerateGood	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW
	350_Moderate	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW

Petaurus norfolcensis/ Squirrel Glider	350_Moderate	
	351_ModerateGood_ Remnant	**Like-for-like credit retirement options**
		Spp / IBRA region
		Petaurus norfolcensis/Squirrel Glider / Any in NSW
Polytelis swainsonii/ Superb Parrot	350_Moderate	**Like-for-like credit retirement options**
		Spp / IBRA region
		Polytelis swainsonii/Superb Parrot / Any in NSW
Synemon plana/ Golden Sun Moth	350_DNG	**Like-for-like credit retirement options**
		Spp / IBRA region
		Synemon plana/Golden Sun Moth / Any in NSW

Synemon plana/ Golden Sun Moth	351_DNG	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Synemon plana/Golden Sun Moth	Any in NSW

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00010359/BAAS17068/18/00012903

Proposal Name
Rye Park Development SEH IBRA

BAM data last updated *
26/11/2019

Assessor Name
Bill Wallach

Assessor Number
BAAS17068

BAM Data version *
22

Proponent Names

Report Created
25/03/2020

BAM Case Status
Open

Assessment Revision
3

Assessment Type
Major Projects

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion

Species
Synemon plana / Golden Sun Moth
Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Predicted Threatened Species Not On Site

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Not a TEC	1.6	31.00
350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	14.7	349.00
351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	Not a TEC	105.0	1733.00

335-Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Floodplain Swamps This includes PCT's: 66, 204, 205, 335, 360, 447, 465, 1291	Inland Floodplain Swamps >=70% and <90%	No	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
350-Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	Yes	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
351-Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

	Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	Yes	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Area	Credits
Petaurus norfolcensis / Squirrel Glider	41.3	1248.00
Polytelis swainsonii / Superb Parrot	10.1	265.00
Synemon plana / Golden Sun Moth	15.2	314.00

Petaurus norfolcensis/ Squirrel Glider	350_Moderate	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW

Petaurus norfolcensis/ Squirrel Glider	350_Moderate	
	351_ModerateGood_ Remnant	**Like-for-like credit retirement options**
		Spp / IBRA region
		Petaurus norfolcensis/Squirrel Glider / Any in NSW
Polytelis swainsonii/ Superb Parrot	350_Moderate	**Like-for-like credit retirement options**
		Spp / IBRA region
		Polytelis swainsonii/Superb Parrot / Any in NSW
Synemon plana/ Golden Sun Moth	350_DNG	**Like-for-like credit retirement options**
		Spp / IBRA region
		Synemon plana/Golden Sun Moth / Any in NSW
	351_DNG	**Like-for-like credit retirement options**

		Spp	IBRA region
		Synemon plana/Golden Sun Moth	Any in NSW

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