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Preserving the Balance of Nature

16 November 2022

Re: Additional Heritage Values and Areas Assessment by Australian Heritage Council - GBMWhA

Introduction

The Lithgow Environment Group Inc (LEG) welcomes this consultation by the Australian Heritage Council (AHC) for assessment of nationally significant values and areas for addition to the Greater Blue Mountains World Heritage Area (GBMWhA). LEG supports the AHC's preliminary assessment of biodiversity, aesthetics, geological heritage, indigenous heritage and historic heritage as described and mapped by the Federal Department of Climate Change, Energy, the Environment and Water. LEG also recommends that the AHC considers the detailed information and reasoning for additional values and areas provided in the 2015 *Values for a New Generation Report* compiled by the Greater Blue Mountains World Heritage Advisory Committee.

In 2000, the Greater Blue Mountains Area was included on the World Heritage list for its outstanding universal natural vegetation and exceptional biodiversity values. LEG notes that cultural (Indigenous and historic) and scenic values were also nominated by the NSW and Australian Governments, but given the nomination was prepared in just six weeks, time defeated the effective justification of these important values. Also at that time the World Heritage Committee was unready to consider cultural landscapes. New discoveries have brought increased awareness of the rich biodiversity, they have also highlighted the fragility of the area, especially at its margins. Since 2000 conservationists, ecologists, geologists and Aboriginal people have presented data and information on other values and adjacent high conservation value (HCV) natural areas that should be listed. As such, LEG recommends that these additional values and areas of high conservation value are now considered for National Heritage Listing.

The AHC assessment refers to Bargo State Conservation Area (SCA), Gardens of Stone SCA, Burratorang SCA, Capertee National Park, Coricudgy State Forest, Finchley Aboriginal Area, Goulburn River National Park and The Drip and Corner Gorge (The Drip and Corner Gorge now in Goulburn River State Conservation Area), Hassans Walls, Muggi Murum-ban SCA, Nattai SCA, Nullo Mountain State Forest and Flora Reserve, Parr SCA (including Comleroy State Forest), Wombeyan Karst Conservation Reserve, Yerranderie SCA, and Comleroy Flora Reserve.

LEG requests the AHC to include all Crown Lands in the Clarence/Dargan, Bell, Mount York, and Hartley areas that were part of the original Gardens of Stone Stage 2 proposal for inclusion in either in a Gardens of Stone SCA, Western Escarpment SCA, or Blue Mountains National Park. (ie. Dargan Creek Reserve, Mount Clarence Reserve, Zig Zag Reserve, Browns Swamp area, Mount York Reserve, and Hyde Park Reserve, to protect threatened flora species not currently protected in the NSW Conservation Estate eg. *Acacia meiantha*, *Asterolasia buxifolia*).

ADDITIONAL BIODIVERSITY VALUES

The Greater Blue Mountains was inscribed on the World Heritage List as a World Heritage Area in 2000 because of the international significance of its natural biodiversity. Its plant and animal species richness, and in particular its diversity and evolutionary significance.

A major focus of that original proposal was to protect biodiversity of the Sydney Basin IBRA region, however the GBMWhA borders on the South Eastern Highlands and South Western Slopes IBRA Region's as well (eg. Gardens of Stone NP, Muggi Murumbidgee SCA, Capertee National Park, Coricudgy State Forest, Goulburn River National Park and The Drip and Corner Gorge, and Nullo Mountain State Forest, which were not adequately protected.

Since the World Heritage Area was inscribed in 2000 -

- Many additional rare flora species and ecological communities have been identified in wider GBMWhA;
- AHC Biodiversity assessments for Flora species appear to be based on Bionet Atlas records, which are inadequate and out-of-date for the Gardens of Stone SCA area in particular. LEG recommends that the AHC also consults more current flora records on AVH, ALA, and iNaturalist Australia;
- There is a need to fill gaps in the NSW Conservation Estate, in particular western parts of the GBMWhA;
- There is an urgent need for specific Conservation Management of State Forest's and Crown Lands adjacent the GBMWhA, in particular fire management;
- There is an urgent need to prioritise protection of high-altitude refuges from Climate Change;
- There is an urgent need to extend Corridor Connectivity along ecological gradients between the Sydney Basin, South Eastern Highlands and South Western Slopes IBRA Region's, in particular between vegetation remnants in State Forest's and Crown Lands across the study area.

LEG highlights the following biodiversity values which are currently not adequately reserved in the NSW National Parks Estate and worthy of inclusion in the GBMWhA –

FLORA SPECIES IN THE ORIGINAL GARDENS OF STONE STAGE 2 PROPOSAL AREA

Current Bionet Atlas records suggest that approximately only 1000 -1100 native flora species occur in the Gardens of Stone Stage 2 Proposal Area. A search of AVH, ALA, and iNaturalist reveals that this figure is closer to 1440 species.

Ben Bullen State Forest contains about 200 species not recorded in Newnes State Forest. The existing Gardens of Stone National Park contains about 100 species not recorded in either Newnes State Forest, Ben Bullen State Forest, or Wolgan State Forest.

Crown Lands in Clarence/Dargan, Bell, Mt York and Hartley contain over 50 native plant species not recorded in Newnes State Forest, Ben Bullen State Forest, Wolgan State Forest or Gardens of Stone National Park.

Conservation International ([Biodiversity Hotspots \(conservation.org\)](https://www.conservation.org)) defines a Biodiversity Hotspot as a region which must have at least 1,500 vascular plants as endemics. The Gardens of Stone region is clearly a Biodiversity Hotspot.

Flora Species recorded in the Gardens of Stone Stage 2 proposal area clearly demonstrate that the GoS region is not representative of the Sydney Basin IBRA Region alone, and that a significant proportion of species representative of the South Eastern Highlands and South Western Slopes IBRA Region's occur as well. Many of these flora species are not adequately reserved in the NSW Conservation Estate or GBMWhA. Preserving these species should be a priority.

THREATENED FLORA SPECIES IN THE ORIGINAL GARDENS OF STONE STAGE 2 PROPOSAL AREA

Below are some of the Threatened Flora Species occurring in the Gardens of Stone Stage 2 Proposal area which are not or have only very recently been added to the Bionet Atlas. LEG urges the AHC to verify these records by searching the AVH, ALA, and/or iNaturalist Australia databases –

- *Kunzea cambagei* (Vulnerable) - 6 records on AVH & ALA in Newnes SF, first recorded in 2010
- **Pultenaea glabra* (Vulnerable) - 20 records on AVH & ALA in Newnes SF, first recorded in 2010
- *Leucopogon fletcheri subsp. fletcheri* (Endangered) – 7 ALA records in Newnes SF
- *Xerochrysum palustre* (Vulnerable) – 1 AVH record March 2019, 8 ALA records 2020 in Newnes & Ben Bullen SF
- *Pultenaea parrisiae* (Vulnerable) – 2019 ALA records in Newnes SF
- *Genoplesium superbum* (Endangered NSW BCA) – numerous sightings in Newnes SF, no records on Bionet
- *Grammitis stenophylla* (Endangered) – 2 recent records by C. Jonkers in Newnes SF
- *Acacia bynoena* (Endangered) – 1 record Dargan Dams Reserve, part of GoS
- *Acacia floetoniae* (Vulnerable) – Western Escarpment, part of original GoS proposal
- *Acacia meiantha* (Endangered) – many records Dargan Dams Reserve, part of original GoS proposal
- *Commersonia prostrata* (Endangered) – 2 AVH 2007 & 2011, 1 x 2021 iNaturalist record - Newnes Plateau

*Note: *Pultenaea glabra* Benth. has recently been split into eight species - one in Victoria and seven in NSW. Six species are newly described, five of which are, like *P. glabra*, are narrow-range endemics within the Greater Blue Mountains World Heritage Area (GBMWhA) and adjacent sandstone landforms of the Great Dividing Range. The recognition of six new species from what was broadly *P. glabra* has implications for conservation management, including for *P. glabra* itself. The Newnes and Ben Bullen State Forest species is *Pultenaea tenebrosa* (Lambs Creek, Kangaroo Creek, Wolgan Cliffs). *Pultenaea furcata* occurs in the Dingo Creek area of Newnes State Forest. *Pultenaea muricata var angusta* occurs near the Glowworm Tunnels in the Wollemi National Park. All have a more restricted distribution than *P. glabra*, and are likely to be listed as Endangered or Critically Endangered in time. *Pultenaea* sp. Genowlan Point is now named *Pultenaea praecipua subsp. praecipua*. Source: [Morphological and molecular evidence refute a broad circumscription for Pultenaea glabra \(Fabaceae: Mirbelieae\), with implications for taxonomy, biogeography, and conservation.](#) [Matthew Renner](#), Russell Barrett, Steven Clarke, James Clugston, Trevor Wilson, Peter Weston.

- Note: A 2009 *Diuris tricolor* (V) record only recently appeared on Bionet (SCAMI0004464) on the Newnes State Forest/Gardens of Stone National Park boundary, and may be in Newnes State Forest.
- Note: Six Bionet Atlas records for *Galium australe* (E) are currently in Quarantine. It may occur in the GoS SCA.
- Note: *Haloragodendron gibsonii* occurs in Newnes State Forest. It may be listed as a Threatened Species?
- Note: *Euphrasia collina subsp. muelleri* (E1) may occur in Newnes State Forest.
- Note: *Persoonia marginata*, *Prostanthera stricta*, *Thesium australe* (NSW 895972) occur in Ben Bullen State Forest.
- Note: *Hibbertia cistiflora subsp. quadristaminae* is currently being assessed for listing as a Threatened species.

- Note: *Xerochrysum palustre* (Vulnerable Commonwealth EPBC Act) records in Newnes and Ben Bullen State Forest's are the most Northerly records in NSW, and represent a 70+ km range extension on the nearest records in Kanangra-Boyd National Park. All other records occur further south in Bondi State Forest, Glenbog State Forest, Tantawangalo State Forest, Deua National Park, Wadbilliga National Park, Victoria and Tasmania. The Commonwealth Threatened Species Profile describes it as a species of Eastern flowing Rivers, yet it occurs along Baal Bone Creek which flows west into the Turon River, Macquarie River system, and ultimately the Murray-Darling catchment.

In addition some 18 ROTAP coded species occur in the Gardens of Stone Stage 2 proposal area, including -

ROTAP coded species recorded in the GoS Proposal Area

- *Acacia asparagoides* (2R) – 100 ALA records in Newnes SF, Bullen SF, Wolgan SF
- *Almaleea incurvata* (2RC-t) – 1 Bionet record Newnes SF, 1 Dargan Dams Reserve
- *Atkinsonia ligustrina* (2RCa) – 3 ALA records Newnes SF
- *Burnettia cuneata* (3RC) – 2 Bionet records
- *Dillwynia stipulifera* (3Rca) – 8 AVH records
- *Epacris muelleri* (3RCi) – 1 AVH record Newnes SF (NSW 1055315)
- *Eucalyptus gregsoniana* (3RCa) – 21 Bionet records Newnes SF
- *Gonocarpus longifolius* (3RC) – 1 AVH record Wolgan SF
- *Hakea constablei* (2RCa) – 4 AVH/Bionet/ALA records Western Escarpment
- *Leptospermum blakelyi* (2R) – 9 AVH records, 1 ALA record
- *Leucochrysum graminifolium* (2R) – 30 Bionet and ALA records
- *Notochloe microdon* (2RC) – 16 AVH and Bionet records
- *Olearia quercifolia* (3RC) – 61 Bionet records
- *Persoonia recedens* (2R) – 36 Bionet records
- *Philothea obovalis* (3Rca) – 27 Bionet records
- *Prostanthera hindii* (2KC) – 20 ALA Records in Ben Bullen & Wolgan SF, 1 record Newnes SF
- *Pseudanthus divaricatissimus* (3RCa) – 16 ALA records
- *Sprengelia monticola* (2RCt) – 1 ALA record C. Jonkers, Dingo Creek, Newnes SF

The recently released Draft Plan of Management and Statement of Management Intent for the Gardens of Stone SCA states that “Forty-two rare or threatened plants have been recorded”. According to LEGs assessment this should more accurately state 30 Threatened Flora Species and 18 ROTAPs occur in the GoS SCA – a total of **forty eight (48)**.

The AHC should note that *Persoonia hindii* (Endangered) in Newnes State, *Acacia meiantha* (Endangered) on Crown land in Clarence, *Asterolasia buxifolia* in Hyde Park Reserve, and several ROTAPs are currently not reserved in any National Park or Reserve in NSW.

ORCHIDACEAE SPECIES IN THE ORIGINAL GARDENS OF STONE STAGE 2 PROPOSAL AREA

145 Orchid species have been recorded in the 39,000Ha GoS Stage 2 proposal area (ALA records). 582 Orchid species occur in NSW and the ACT (*Guide to Native Orchids of NSW and ACT – Lachlan M. Copeland, Gary N. Backhouse. 2022*). 25% of the NSW total can be reserved by including the 39,000 Ha GoS SCA Stage 2 Proposal areas in the

GBMWA. A Bionet search (June 2020) found only one NSW National Park which came close to conserving as many Orchid species - Blue Mountains NP with 132 species. Compared to the other 878 NSW National Parks & Reserves:

- Morton National Park = 83 Orchid species
- Wollemi National Park = 79 Orchid species
- Kosciuszko National Park = 77 Orchid species
- Guy Fawkes River National Park = 71 Orchid species
- Kanangra-Boyd National Park = 70 Orchid species
- New England National Park = 65 Orchid species
- Washpool National Park = 65 Orchid species
- South East Forest National Park = 51 Orchid species

Orchidaceae species are regarded as excellent indicators of ecosystem health and conservation effectiveness (Swarts & Dixon, 2009; Newman et al 2007).

The importance of preserving *high altitude refuges* from climate change for Orchidaceae species in the NSW National Parks estate has been raised in many research papers.

Below is a list of Orchid species recorded in the Gardens of Stone SCA Stage 2 proposal area. LEG urges the AHC to verify these records on AVH, ALA, and iNaturalist databases rather than relying upon Bionet Atlas records only-

Acianthus apprimus – Helen Drewe, Hassans Walls Reserve

Acianthus exsertus – C.H. Curnow 1956 Cullen Bullen. C. Jonkers & J. Favell, Ben Bullen SF & Newnes SF

Acianthus fornicatus – Bionet record 2005 Lidsdale SF. Chris Jonkers & Julie Favell, Ben Bullen SF

Acianthus pusillus – Bionet records Ben Bullen SF. C. Jonkers & J. Favell, Newnes SF. **H. Drewe - Hassans Walls**

Adenochilus nortonii – Type: R. Fitzgerald 1876 Mt Victoria. M.A. Clements 1977 Clarence. C. Jonkers Newnes SF

Arthrochilus huntianus – Helen Drewe, Maiyingu Marragu Reserve. H. Drewe & K. Durie, Hassans Walls Reserve

Burnettia cuneata (3RC) – 2 Bionet records Newnes SF

Caladenia angustata – 2 ALA records, Western Escarpment

Caladenia capillata – 1 ALA record, Newnes SF

Caladenia carnea – Bionet records Newnes SF. C. Jonkers, Newnes SF & Ben Bullen SF. H. Drewe - Hassans Walls

Caladenia catenata – Bionet records Newnes SF & Cullen Bullen. Chris Jonkers & Julie Favell, Ben Bullen SF.

Caladenia congesta – Hassans Walls Reserve

Caladenia cucullata – D.H. Benson 1981 Paddys Creek Swamp Newnes SF. C. Jonkers & J. Favell, Ben Bullen SF

Caladenia curtisepala – Hassans Walls Reserve

Caladenia dimorpha – Type: R. Fitzgerald 1875 Hassans Walls. Chris Jonkers & Julie Favell, Newnes & Ben Bullen SF

Caladenia fitzgeraldii – E. Gordon 1961 Clarence. C. Bower 1998 Browns Gap. C. Jonkers & J Favell Ben Bullen SF

Caladenia fuscata – AVH: K.J. Fitzgerald 2000 River Lett. C. Jonkers & J. Favell Newnes SF. H. Drewe - Hassans Walls

Caladenia gracilis – W.F. Blakely 1939 Clarence. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Caladenia iridescens – I. Bowden, 24-10-1948, AVH record Mt Victoria (Western Escarpment)

Caladenia moschata – E. Nubling, 1934-10-29, AVH record, Bell (Western Escarpment)

Caladenia tentaculata – E.C. Chisholm 1921 Marrangaroo. Chris Jonkers & Julie Favell, Ben Bullen SF

Caladenia transitoria – 5 ALA records, Newnes SF

Caladenia testacea – 1 ALA record Ben Bullen SF

Caleana major- Bionet records 2011 & 2014. C. Jonkers & J. Favell, Newnes SF & Ben Bullen SF. H. Drewe – Hassans

Caleana minor – 2 ALA records, Newnes SF

Caleana nublingii – E. Nubling, 1930-12-27, AVK record, Bell (Western Escarpment)

Calochilus campestris – Bionet record 1979 Wambool NR. Chris Jonkers & Julie Favell, Ben Bullen SF

Calochilus gracillimus – P.B Metcalfe 1976 Bell. C. Jonkers & J. Favell, Newnes & Ben Bullen SF. H. Drewe - Hassans

Calochilus paludosus – J. Slow 2015 Newnes SF. C. Jonkers Newnes SF & Ben Bullen SF. H. Drewe - Hassans Walls

Calochilus robertsonii – J.K. Fitzgerald.2000 River Lett. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Cestichis reflexa – Bionet records Chris Jonkers & Julie Favell, Newnes SF. AVH records, Western Escarpment

Chiloglottis curvicalvia – D.L. Jones 1993 Mount Wilson. Chris Jonkers & Julie Favell, Newnes SF & Ben Bullen SF

Chiloglottis formicifera – Type: R.G. Fitzgerald 1877. C Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Chiloglottis reflexa – 4 Bionet records Newnes SF. C. Jonkers, Newnes SF & Ben Bullen SF. H. Drewe - Hassans Walls

Chiloglottis seminuda - NSW 995079 Mt Victoria. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Chiloglottis sylvestris - CANB 733377.1 Mt Wilson 2006. C Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Chiloglottis trapeziformis - NSW618898 1999 Hartley. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Chiloglottis trilabra – Bionet 2003 Clarence. Chris Jonkers & Julie Favell, Ben Bullen SF. Helen Drewe - Hassans Walls

Corybas fimbriatus – AVH: C.H. Curnow 1956 Cullen Bullen. C. Jonkers & J. Favell, Ben Bullen SF

Corybas hispidus – A. Orme 2017 River Lett. Suzanne Lollback 2015 Browns Gap. C. Jonkers Ben Bullen & Newnes SF

Cryptostylis erecta – Bionet record Newnes SF

Cryptostylis leptochila – Bionet records Newnes & Ben Bullen SF. C. Jonkers & Julie Favell, Newnes & Ben Bullen SF

Cryptostylis subulata – A.A. Hamilton 1915 “*Esbank near Lithgow*”. C. Jonkers & J. Favell, Newnes SF. H. Drewe, Hassans

Cyanicula caerulea – Bionet records Darling Causeway, Yetholme, Capertee. C. Jonkers & J. Favell, Ben Bullen SF

Cyrtostylis reniformis – Bionet records Newnes & Ben Bullen SF. C. Jonkers & J. Favell, Newnes SF & Ben Bullen SF

Dendrobium linguiforme – Bionet records Newnes Plateau. Chris Jonkers & Julie Favell, Newnes SF

Dendrobium pugioniforme – 1 record Western Escarpment

Dendrobium speciosum - Bionet records Newnes Plateau. C. Jonkers & J. Favell, Newnes SF & Ben Bullen SF

Dendrobium striolatum - Bionet Newnes Plateau. C. Jonkers & J. Favell, Newnes & Ben Bullen SF. H. Drewe Hassans

Dendrobium teretifolium - Bionet record Newnes Plateau. Chris Jonkers & Julie Favell, Newnes SF

Dipodium hamiltonianum (*Dipodium interaneum*) Bionet records Capertee. C. Jonkers & J. Favell in GoS area

Dipodium punctatum – Bionet records Newnes SF

Dipodium roseum – J.L. Boorman 1914 “*Lithgow Water Works*” C. Jonkers & J. Favell, Newnes SF & Ben Bullen SF

Diuris sp. aff. abbreviata – Hassans Walls Reserve

Diuris amabilis – 1 ALA record, Newnes SF. 1 ALA record Ben Bullen SF

Diuris aurea – 2 ALA records Ben Bullen SF. AVH Record D.H. Benson, 19/11/1981, Newnes SF

Diuris calcicola – 6 records (1 Bionet, 5 Australian National Herbarium) in Hartley Vale area (Western Escarpment)

Diuris chryseopsis – 1 ALA record Ben Bullen SF, additional records nearby in Blackmans Flat

Diuris flavopurpurea – M.A. Clements, 10-12-2018, Mt Victoria. 6 AVH records Western Escarpment.

Diuris lineata – H.M.R. Rupp, 1-10-1943, Mt Victoria. AVH. 4 AVH records Western Escarpment

Diuris maculata – 7 ALA records Ben Bulln SF. AVH records 1960 Clarence, 1955 Blackmans Flat. Hassans Walls

Diuris platchila – 2 ALA records Ben Bullen SF. Bionet 2004 record Newnes SF

Diuris pardina – 2 ALA records Ben Bullen SF. AVH records near Clarence

Diuris polymorpha – 4 x 1943 and 1960 AVH records, Mount Victoria (Western Escarpment)

Diuris punctata – Bionet record Hartley (Western Escarpment)

Diuris semilunulata – 1 ALA record Ben Bullen State Forest

Diuris sulphurea – Bionet records Newnes SF. C. Jonkers & J. Favell, Ben Bullen SF & Newnes SF. H. Drewe, Hassans

Diuris tricolor – 1 Bionet record on Newnes SF/Gradens of Stone NP boundary

Eriochilus cucullatus – E.C. Chisholm 1922 Marrangaroo. C. Jonkers & J. Favell. Ben Bullen, Newnes & Wolgan SFs

Eriochilus petricola – AVH record: D.L. Jones, 17-02-1990, Bell (Western Escarpment)

Gastrodia procera – Bionet record Kerosene Vale Ash Repository (KVAR)

Gastrodia sesamoides – W. Brinsley 1962 Yetholme. C. Jonkers & J. Favell, Ben Bullen & Newnes SF. H. Drewe Hassans

Genoplesium ansatum – R.D. Fitzgerald, Prasophyllum ansatum 1890. Chris Jonkers & Julie Favell, Newnes SF

Genoplesium apastasioides – 2 ALA records Newnes SF. C. Jonkers Ben Bullen & Newnes SF. H. Drewe - Hassans

Genoplesium archerii – 3 ALA records & an AVH record 1971-01-17 in Newnes SF

Genoplesium cuspidatum – AVH record only recently appeared on AVH in Newnes SF. *G. archeri* complex.

Genoplesium densum – ALA record Clarence. D.L. Jones 1989 Flagstaff Hill. Newnes SF. H. Drewe - Hassans Walls

Genoplesium eriochilum – 1 ALA record Newnes SF. Chris Jonkers & Julie Favell, Newnes SF (still to be confirmed)

Genoplesium fimbriatum – R.G. Coveney AVH 1968 Newnes SF (NSW 208986). Helen Drewe Hassans Walls Reserve

Genoplesium morrisii – AVH record Crown Land at Clarence

Genoplesium mucronatum – C.K. Ingram 1969 Mt Charles. Chris Jonkers & Julie Favell, Newnes SF & Ben Bullen SF

Genoplesium nudiscapum – 6 Records (2 Bionet 3 AVH) Mount Victoria and Bell (Western Escarpment)

Genoplesium nudum – 2 x 1956 records (Bionet and AVH), Bell (Western Escarpment)

Genoplesium reflexum – Robert Fitzgerald 1885 Jamberoo Mountain. Chris Jonkers & Julie Favell, Newnes SF

Genoplesium saggitiferrum – AVH records in Newnes SF. Helen Drewe - Hassan Walls Reserve

Genoplesium simulans – 9 ALA records & 2 AVH records 2020-04-07 (NSW 1098828 & NSW 1098826) in Newnes SF

Genoplesium superbum (E1) – Bionet 2005 record Newnes SF. Chris Jonkers & Julie Favell, Newnes & Ben Bullen SF

Genoplesium woollsii – 2 ALA records Newnes SF

Glossodia major – J.L. Boorman 1914 “Morts Gully”. C. Jonkers & J. Favell, Newnes & Ben Bullen SF. H. Drewe Hassans

Lyperanthus suaveolens – 2 iNaturalist records 2022

Microtis oblonga – Bionet record 2012 Cullen Bullen. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe - Hassans Walls

Microtis parviflora - Chris Jonkers & Julie Favell, Ben Bullen SF & Wolgan SF. Helen Drewe Hassans Walls

Microtis rara – AVH, Newnes SF

Microtis unifolia – Bionet records Newnes & Ben Bullen SF. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans

Orthoceras strictum – P. Hind Dargan Dams Reserve 1986. C. Jonkers & J. Favell, Newnes SF. H. Drewe - Hassans Walls

Paracaleana minor – H. Curnow 1930 Dargan. C. Jonkers & J. Favell, Newnes & Ben Bullen SF. H. Drewe Hassans Walls

Prasophyllum australe – 2 ALA records Newnes SF (Paddy’s Creek Swamp, Kangaroo Creek Swamp)

Prasophyllum brevibracte – 3 ALA records Newnes SF. AVH 1908 Clarence.

Prasophyllum elatum – 1 ALA record Newnes SF, 2 ALA records Western Escarpment

Prasophyllum flavum – 1 ALA record Newnes SF. 2 in Ben Bullen SF. Helen Drewe - Hassans Walls Reserve

Prasophyllum fuscum – 4 records Western Escarpment

Prasophyllum odoratum – J. Dark 1986 Hassans Walls. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe – Hassans Walls

Prasophyllum pallens (V) – 85 ALA records Newnes SF. 3 records Western Escarpment

Prasophyllum patens – 1 record Western Escarpment. C. Jonkers & J. Favell, Hassans Walls Reserve

Prasophyllum striatum – F.H. Kenny 1908 Clarence (AD 97729038). Chris Jonkers & Julie Favell, Newnes SF

Pterostylis acuminata – B.G. Briggs 1972 upper Grose R. Chris Jonkers & Julie Favell, Ben Bullen SF

Pterostylis ampliata - C. Jonkers & J. Favell, Ben Bullen State Forest (formerly known as *Diplodium sp aff revolutum*)

Pterostylis antennifera – B. Johnson 1977 Kanimbla (NSW 217216). C. Jonkers & J. Favell, Newnes & Ben Bullen SF

Pterostylis bicolor – 1 ALA record Newnes SF. Bionet Lithgow 2005. C. Jonkers & J. Favell, Ben Bullen SF

Pterostylis bryophila – AVH record 21/4/2017, A.E. Orme, Hartley (Western Escarpment)

Pterostylis chocolatina – Type: Bodington Hill. C. Jonkers & J. Favell, Newnes SF. H. Drewe – Hassans Walls Reserve

Pterostylis coccinum – Type: Robert Fitzgerald 1878 Hassans Walls. C. Jonkers & J. Favell, Newnes SF & Wolgan SF

Pterostylis concinna – Bionet records Capertee Valley. Chris Jonkers & Julie Favell, Newnes SF and Wolgan SF

Pterostylis corpulenta – 5 Records (2 Bionet, 3 AVH) Mount Victoria, Clarence & Hartley (Western Escarpment)

Pterostylis crebra – 9 ALA records Newnes SF. B. Whitehead 1968 Clarence.

Pterostylis curta – H. Curnow 1958 Bell. C. Jonkers & J. Favell, Ben Bullen SF. Helen Drewe Hassans Walls Reserve

Pterostylis decurva – Alison Orme 2017 River Lett. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans Walls

Pterostylis fischii – Alison Orme 2017 River Lett. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans Walls

Pterostylis grandiflora – 1 ALA record Newnes SF. 2 AVH records near Bell (Western Escarpment)

Pterostylis laxa – H. Curnow 1975 W end Capertee V. C. Jonkers & J. Favell Ben Bullen SF. H. Drewe Hassans Walls

Pterostylis lineata – Type: Woodford 1999. R.G. Coveney 2009. Hassans. C. Jonkers & J. Favell, Ben Bullen SF

Pterostylis longifolia – Bionet records Newnes SF. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe, Hassans Walls

Pterostylis mutica – Bionet records Wallerawang & Marrangaroo NP. Chris Jonkers & Julie Favell, Ben Bullen SF

Pterostylis nutans – C.H. Curnow 1959 Clarence. R.B. Filson 1968 Zig Zag. Chris Jonkers & Julie Favell, Newnes SF.

Pterostylis obtusa – Hassans Walls Reserve. Newnes State Forest

Pterostylis parca – Type: D.L. Jones, Browns Gap 1999. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans Walls

Pterostylis parviflora (corpulenta) – W. Brinsley 1962 Clarence. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans

Pterostylis pedunculata – D.L. Jones 1999 Hassans Walls. C. Jonkers & J. Favell, Newnes SF. H. Drewe Hassans Walls

Ptersotylis revoluta - C. Jonkers & J. Favell, Ben Bullen State Forest

Pterostylis rubescens – C.H. Curnow 1956 Cullen Bullen. C. Jonkers & J. Favell, Newnes SF. H. Drewe Hassans Walls

Pterostylis tenuis – D.L. Jones 1999 (NSW 812444) Browns Gap. H. Drewe, C. Jonkers, J. Favell – Newnes SF, Hassans

Pterostylis truncata – C.H. Curnow 1956 Cullen Bullen. C. Jonkers & J. Favell, Ben Bullen SF. H. Drewe Hassans Walls

Rimacola elliptica – A.W. Dockrill 1946 Bell. I. Telford 1976 Glen Davis. Chris Jonkers & Julie Favell, Newnes SF

Spiranthes australis – Bionet records Newnes & Ben Bullen SF. C. Jonkers & J. Favell, Newnes SF & Ben Bullen SF

Thelymitra angustifolia – AVH record (NSW 890106) collected 2009-11-12 in Newnes SF

Thelymitra atronitida - 1 ALA record Ben Bullen State Forest

Thelymitra brevifolia – 1 ALA record Newnes SF

Thelymitra carnea – 1 ALA record Newnes SF. Bionet record Clarence. Chris Jonkers & Julie Favell Ben Bullen SF

Thelymitra circumspecta – 3 ALA records Newnes SF

Thelymitra cyanea – 7 ALA records Newnes SF

Thelymitra ixioides – 11 ALA records Newnes SF. C. Jonkers & J. Favell Ben Bullen & Wolgan SF. Hassans Walls

Thelymitra pauciflora – 4 ALA records Newnes SF, more in Ben Bullen SF. Helen Drewe Hassans Walls Reserve

Thelymitra nuda – 6 ALA records Newnes SF. Helen Drewe Hassans Walls

Thelymitra peniculata – AVH record (NSW 1002487) on 2016-08-17 in Newnes SF

Thelymitra venosa – 5 ALA records Newnes SF.

(Note: An 02-2009 *Diuris tricolor* (V) record only recently appeared on Bionet on the Newnes SF/GoS NP boundary)

PROSTANTHERA SPECIES IN THE GARDENS OF STONE REGION

About 90 *Prostanthera* species occur in Australia (3 Critically Endangered, 3 Endangered, 13 Vulnerable), and 60 in NSW (12 Threatened). Over one-third of the NSW total occur in the Lithgow LGA (3 Threatened, 1 ROTAP). At least 15 of those could be reserved in a Gardens of Stone SCA.

In the wider region *Prostanthera stenophylla* (E1) occurs at Dunns Swamp, *Prostanthera discolor* (V) near Sandy Hollow (though those records may now be *Prostanthera cineolifera* V), *Prostanthera violacea* in the Grose Valley, and *Prostanthera gilesii* (E1) near Orange (and possibly Evans Crown NR). Adelaide Botanic Gardens holds a *Prostanthera aspalathoides* specimen from Glen Davis (AD 97648299).

They typically occur as small, localised populations in exposed habitats (eg. rocky escarpments and rock outcrops). Eight or 36% of these species do not occur in the Blue Mountains or Sydney bioregion.

36%+ of Mint Bush species in the GoS region are arguably not Sydney sandstone flora, and are not adequately reserved. Inclusion of these areas in the GBMWhA could address this.

PERSOONIA SPECIES IN THE GARDENS OF STONE REGION

About 100 *Persoonia* species occur in Australia. In NSW alone 23 species (almost 25% of the Australian total) are listed as Threatened. Two species are already Extinct (*Persoonia laxa* and *P. prostrata*), and more are headed the same way without adequate Conservation Management, in particular fire.

The Lithgow LGA hosts more *Persoonia* species than all 130 LGA's in NSW, coming equal first with Wingecarribee LGA at 24 species (Source: *Bionet*, 6 June 2020). This includes two Endangered species (*Persoonia hindii* E1, and *Persoonia hirsuta* E1, two Vulnerable species (*Persoonia acerosa* and *Persoonia marginata*), and a ROTAP coded species (*Persoonia recedens* 2R).

Newnes State Forest hosts more *Persoonia* species than all 522 State Forests in NSW (*Bionet Atlas*, 6 June 2020).

Persoonia hindii (Endangered) is not protected in any NSW National Park or Reserve. *Persoonia marginata* (V) is not representative of Sydney sandstone flora and not adequately reserved.

The Biodiversity Summary for Hawkesbury-Nepean Region (2011) identified that “*This region rates highly for endemism and richness of Proteaceae.*”

Which existing NSW National Parks protect more than 18 *Persoonia* species? Blue Mtns National Park = 22, Wollemi National Park = 18, Morton National Park = 15, Kanangra-Boyd National Park = 13, Ku-ring-gai National Park = 10.

Including the Gardens of Stone region in the GBMWhA could immediately conserve 18 *Persoonia* species - 2 Endangered, 2 Vulnerable, and become the most important NPWS reserve for *Persoonia* in NSW.

RUTACEAE SPECIES IN GOS

In 2001 Tony D. Auld reported “The ecology of Rutaceae species remains poorly understood, a pattern typical across Australia”, and in particular “the impact of a regime of high fire frequency”. (*Cunninghamia Vol. 7(2): 2001 The ecology of the Rutaceae in the Sydney region of south-eastern Australia: Poorly known ecology of a neglected family*).

This remains as true today as it was in 2001, a major concern in the Lithgow LGA which has a poor history of fire management.

The Biodiversity Summary for Hawkesbury-Nepean Region (2011) identified that “*This region rates highly for endemism and richness of Rutaceae.*”

18 *Boronia* species are recorded in the Lithgow LGA. Bionet lists 16 species, AVH lists an additional 2. Comparing this to the number *Boronia* species in NSW National Parks: Morton NP = 17, Wollemi NP = 17, Blue Mountains NP = 14, Ku-ring-gai Chase NP = 10, Royal NP = 6, Kosciuszko NP = 2.

Five (5) of the 14 known *Asterolasia* species in NSW including two Threatened Species have been recorded on ALA as occurring in the Lithgow LGA (*Asterolasia buckinghamii*, *Asterolasia buxifolia* (E1), *Asterolasia correifolia*, *Asterolasia elegans* (E1), and *Asterolasia rivularis*. *Asterolasia buxifolia* is not protected in any NSW National Park or Reserve. Australia-wide there are 19 *Asterolasia* species, 53% of which are listed as Threatened.

Seven *Philotheca* species are recorded in the Lithgow LGA. And whilst those species may appear to have a wide distribution in NSW, in the Lithgow area they tend to be isolated disjunct occurrences, perhaps remnants of western vegetation types that once existed when the climate was much cooler and drier.

Australia-wide 60 *Zieria* species are described, 21 (35%) of which are listed as Threatened (1 Critically Endangered, 12 Endangered, 8 Vulnerable). In NSW 19 *Zieria* sp (or 31% of total) are listed as Threatened.

“A rare shrub, of humble growth” is how Alan Cunningham (1781-1839) described *Zieria obcordata* (E1) on “Hills above the Macquarie River” in 1824. This aptly describes the nine (9) *Zieria* species recorded in the Lithgow LGA, most of which are in GoS. (*Zieria arborescens*, *Z. aspalathoides*, *Z. caducibracteata*, *Z. compacta*, *Z. cytisoides*, *Z. laevigata*, *Z. murphyi*, *Z. pilosa*, *Z. smithii*). Many are western flora, not Sydney sandstone flora. They may not be adequately reserved in the NSW National Parks estate.

Including the Gardens of Stone region in the GBMWhA could help address what Tony D. Auld described in 2001 as “*Rutaceae: Poorly known ecology of a neglected family*”, and the 2011 Summary for Hawkesbury-Nepean Region reported “*This region rates highly for endemism and richness of Rutaceae.*”

Many “rare and humble shrubs” occur as isolated remnants on rocky outcrops, sandstone pagodas, talus slopes, cave overhangs, below cliff-lines, and in slot canyons in the Gardens of Stone region. Conserving them in the GBMWhA would enable appropriate Conservation Management to protect them in perpetuity.

ASTERACEAE SPECIES

The Lithgow LGA hosts more Asteraceae species (232) than all 878 NSW National Parks except Kosciuszko NP (272). Many are rare (ie. *Xerochrysum palustre* V, *Olearia asterotricha*, *Olearia cordata* V, *Olearia quercifolia* 2R, *Olearia suffruticosa*, *Leucochrysum graminifolium* 2R).

One Asteraceae species is already Presumed Extinct (*Olearia aliganthema*), last recorded in the Blue Mountains in 1866.

One example from the GoS area is ***Olearia suffruticosa***. Only 5 AVH records occur in NSW, all others in Victoria. Two are old 1901 collections by Joseph Maiden at Capertee and J.L Boorman at Wallerawang. More recent records are by S. Bell in 1995 at Wallerawang and R.L. Johnstone in 2012 on the Turon River. Boorman's 1901 record is mapped where the recent 13,000 litre Caustic Soda spill from Wallerawang STP occurred. Bell's 1995 record is mapped where Wallerawang Public School now stands (opened 1995). Anyone who has visited Turon NP will know how weedy that area is. Listed as Endangered in South Australia and Vulnerable in Victoria (*Advisory List of Rare or Threatened Plants in Victoria 2014*).

Including the Gardens of Stone region in the GBMWA could protect these species in perpetuity.

EXOTIC TAXA/WEEDS

The Gardens of Stone proposal area is remarkably free of exotic or weed species compared to the neighbouring National Parks. 13% of plant taxa recorded in Blue Mountains NP are exotic (1,961 native, 254 exotic), and 8.3% of plant taxa in the Wollemi NP are exotic (1,934 native, 160 exotic). Kosciuszko NP is the weediest National Park in NSW with over 23% of exotics (344 exotic, 1483 native).

By contrast Newnes State Forest has 5.7% exotic taxa (1100 native, 63 exotic), Ben Bullen SF 6% exotic taxa (720 native, 48 exotic), and Wolgan SF only 4% exotic taxa (195 native, 8 exotic).

This is an excellent indicator of ecosystem health and conservation effectiveness. Including these area in the GBMWA could allow appropriate Conservation Management to maintain this relatively weed-free status.

VEGETATION COMMUNITIES

The recent Gardens of Stone Draft Plan of Management stated that “33 different plant communities” of which “16 are threatened ecological communities” occur in the new Gardens of Stone SCA

The Statement of Management Intent states “The 16 rare vegetation communities include three threatened ecological communities –White Box-Yellow Box-Blakelys Red Gum Woodland Endangered Ecological Community (EEC); Newnes Plateau Shrub Swamps EEC, Montane Peatlands and Swamps of the New England Tableland, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions EEC. These elevated groundwater-dependent shrub swamps occur only above 400 metres elevation and are degraded as a result of mine subsidence, climate change and other threats. These communities face a high risk of becoming extinct in NSW's nature areas unless the circumstances and factors threatening their survival or evolutionary development cease to operate”.

LEG has concerns that several vegetation communities may not have been identified by the NPWS -

MU1 Sandstone Warm Temperate Rainforest

Inadequate Bionet data for rainforest species occurring in Newnes State Forest may have masked the presence of MU1 or other remnant rainforest types. MU1 is the rarest vegetation community of all in Newnes State Forest, covering only a handful of hectares in the many slot canyons and gorges.

Species LEG has recorded in Newnes SF indicative of remnant rainforest not listed on Bionet include:

- *Atherosperma moschatum* (Southern Sassafras) - most canyons Newnes SF, Dargan Dams
- *Doryphora sassafras* (Sassafras) – Canyons off Carne Creek, Newnes SF
- *Elaeocarpus holopetalus* (Black Olive Berry) – most canyons in Newnes SF, Dargan Dams
- *Elaeocarpus reticulatus* (Blueberry Ash) – canyon off Carne Creek, Ben Bullen and Wolgan SF
- *Hedycarya angustifolia* (Native Mulberry) - Bungleboori Creek Newnes SF
- *Myrsine howittiana* (Brush Muttonwood) - Wolgan Falls, Wolgan Gap, Baal Bone Gap
- *Nematolepis squamea* (Satinwood) - Dingo Ck, Bungleboori Ck, Baal Bone Gap Ben Bullen SF
- *Pittosporum revolutum* – Wolgan Falls Newnes SF
- *Stenocarpus salignus* – Wolgan Falls Newnes SF
- *Brachychiton populneus* – Wolgan Falls Newnes SF
- *Ficus rubiginosa* – Wolgan Falls & cliffs Newnes SF
- *Pandorea pandoreana* – Bungleboori Creek
- *Smilax glycyphylla* – Bungleboori Ck, Dingo Ck, Carne Ck, Wolgan Falls - Newnes SF
- *Parsonsia brownii* (Silkpod) - Bungleboori Ck, Dingo Ck, Carne Ck, Newnes SF
- *Notelaea ovata* – 9-mile Pine plantation Newnes SF
- *Libertia pulchella* - Dingo Creek Newnes SF
- *Marsdenia rostrata* - Wolgan Falls Newnes SF
- *Alania cunninghamii* – Dingo Creek Newnes SF

In 2006 the DEC undertook a vegetation assessment over an area of 157 000 hectares from Kandos in the north to Gurnang in the south (DEC (2006) *The Vegetation of the Western Blue Mountains. Unpublished report funded by the Hawkesbury – Nepean Catchment Management Authority. DECC*).

A total of 57 vegetation communities were mapped covering parts of the Sydney Basin Bioregion and South-eastern Highlands Bioregion.

The MU1 vegetation community was assessed as covering only 4 Ha of the 157 000 Ha study area, or 0.0025% of the total. MU1 covered the smallest area of all 57 vegetation communities, followed by MU7 Genowlan Point Dwarf She-oak Heathland at 16 Ha, and MU 57 Capertee Riparian Melaleuca Thickets at 32 Ha. MU 50 Newnes Plateau Shrub Swamps were estimated as covering 394 Ha.

One example of a rainforest species is *Rhodamnia rubescens* (Critically Endangered NSW BCA). This species has been decimated by Myrtle Rust across NSW, however high-altitude plants may represent a rust-resistant gene pool. There is an AVH record by J.L. Boorman dated 1-1-1914 (although Boorman's notes say 29 January 1914) in the Lithgow LGA

“Generally considered as a pretty coastal plant but in this district a spare plant here & there are represented, all of diminutive growths”.

Boorman’s records appear to be lumped into one place on Bionet - a dry ridge north of Lithgow. However on 29 January 1914 Boorman collected *Glossodia major*, *Boronia rigens*, *Isotoma axillaris* and *Persoonia myrtilloides* subsp. *myrtilloides* in “Morts Gully” (State Mine Gully), and *Epacris crassifolia*, *Dipodium roseum*, and *Platysace lanceolata* in “Waterworks Gully”. On 28 January 1914 he collected *Actinotus minor* on Hassan’s Walls. The gullies around Newnes Plateau are far more likely habitats for *Rhodamnia rubescens* than a dry ridge north of Lithgow. It may still occur in the GoS SCA, but won’t be found unless the NPWS conducts a Comprehensive Flora Assessment for MU1 in the GoS SCA.

Haloragodendron gibsonii (E1), *Lastreopsis hispida* (E1), and *Grammittis stenophylla* (E1) are others.

These Rainforest Communities are threatened by increased high intensity bushfires (and RFS backburning on catastrophic fire weather days); prolonged droughts; and longwall mining draining upstream swamps which maintain the water flow into these remnant rainforest communities.

The MU1 vegetation community covers the smallest area of all vegetation communities in the GoS SCA. Only 4 Ha of MU1 was recorded in a 2006 DECC study of the wider western region. MU1 should be listed as a Critically Endangered EEC in the Lithgow LGA, with Key Threatening Processes (KTPs) of *High Intensity bushfires* and *Inappropriate RFS Backburning*; and *Alteration of habitat following subsidence due to longwall mining* (NSW Scientific Committee 2005).

Aeolian Sand Dune Vegetation Community

Several aeolian (wind formed) sand dunes dating back to the Last Glacial Maximum occur in Newnes State Forest. For wind erosion to have occurred Newnes Plateau must have been above the tree line 15,000 – 30,000 years ago, due to the climate being 8–9°C colder and drier. The vegetation differs from surrounding vegetation with more *Banksia*’s, Grass trees, and a different suite of understorey species.

These sand dunes may support a unique vegetation community which once occurred on Newnes Plateau during the last ice age. They are currently undetectable on Bionet/SEED. (Hesse, *et al*, 2003, *Later Quaternary aeolian dunes on the presently humid Blue Mountains, Eastern Australia. Quaternary International*, 108: 13-32.)

Kunzea parvifolia Swamp Community

Another potentially unique swamp community occurs in just one small area of Ben Bullen State Forest - a low heathland on impeded drainage dominated by *Kunzea parvifolia*, *Calytrix tetragona*, *Dillwynia phyllicoides*, *Dodoanea boroniifolia*, and *Prostanthera saxicola* var *bracteolata*. It may be a remnant of a once more widespread community which has since been cleared.

Eucalyptus polyanthemos reaches its NSW easterly limit near here, and *E. blakelyi*, and *E. melliodora* also occur – indicative of the critically endangered Grassy Box Woodlands EEC. *Persoonia marginata* (V) and *Boronia nana* var. *hyssopifolia* occur on the verges. It supports a wide variety of Orchid species, and an undescribed *Hibbertia* species with a zygomorphic androecium which Dr Helmut Toelken and Rob Miller are currently describing.

Tablelands Frost Hollow Grassy Woodlands

The community of “*Tablelands Snow Gum, Black Sallee, Candlebark, and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, Southern East Corner and NSW South Western Slopes Bioregions*” occurs in the lower part of Newnes State Forest and in Ben Bullen State Forest, and therefore the GoS SCA. This Vegetation Community has often been overlooked in mining EISs, and is under-reported on Bionet/SEED. Inadequate Bionet records may be masking the presence of this EEC. For example, *Eucalyptus stellulata* and *E. bridgesiana* are indicators of this vegetation community but have not been recorded as occurring on Bionet in Newnes State Forest.

The AHC assessment should consider conserving these Vegetation Communities within the GBMWhA, so that appropriate Conservation Management regimes can be implemented to protect them in perpetuity.

ADDITIONAL VALUES

The Lithgow Environment Group recognises that during the years since the Greater Blue Mountains was included on the National Heritage List (2007) there has been a growing understanding of the importance of the Geodiversity of the area. Advances in technology have supported a greater understanding, recognition and appreciation of the natural and cultural landscapes on a global scale. We therefore support the additional values of Geomorphology, Aesthetic and Cultural Heritage being added for National Heritage listing consideration and assessed across the whole expanded area. (REF Values report Chapters)

Geomorphology

The Greater Blue Mountains World Heritage Area contains extensive and significant geodiversity of high geoheritage and geoconservation significance. It is an excellent example of the development of geological and geomorphological systems over time in Australia and contains features of international and national significance that compare extremely highly with other areas already recognised for national geodiversity significance. In many cases they are the best, or only examples in Australia of these features. In several cases they are the likely best in the world. Areas adjacent to the Blue Mountains WHA contain a further site of international significance (Wombeyan Caves), while Newnes Plateau (Newnes, Ben Bullen and Wolgan State Forests) contain nationally significant highland swamps, Aeolian dunes and smooth pagodas (as well as internationally significant platy pagodas not in the Greater Blue Mountains WHA).

Washington, H. & Wray, R. (2011) ‘The geoheritage and geomorphology of the sandstone pagodas of the north western Blue Mountains region (NSW)’, Proceedings of the Linnean Society of New South Wales 132:131-143

Hesse, P., Humphreys, G., Selkirk, P., Adamson, D., Gore, D., Nobes, D., Price, D., Schwenninger, J., Smith B, Tulau, M. & Hemmings, F. (2003) ‘Late Quaternary aeolian dunes on the presently humid Blue Mountains, Eastern Australia’, Quaternary International 108:13–32

Crawford, E., Herbert, C., Taylor, G., Helby, R., Morgan, R. & Ferguson, J. (1980) ‘Diatremes of the Sydney Basin’, In: Herbert, C. & Helby, R. (Eds) A Guide to the Sydney Basin, Bulletin of the Geological Survey. N.S.W. 26:294-232

Clarence Colliery recently struck an underground diatreme in the Boot area of Newnes State Forest. Vegetation in this area is quite unique. Some 90 Jurassic diatremes intrude the Sydney Basin geology (Crawford et al., 1980). Mapping by Crawford (1973) showed a small number of diatremes in the eastern part of the Blue Mountains near Springwood, and a larger concentration in northwest Wollemi NP near Mt. Coricudgy. Two of the few diatremes with natural exposures of breccias are 'Euroka Clearing' near Glenbrook and 'Lost World' crater in Wollemi NP, both in the Greater Blue Mountains WHA. Apart from their mode of formation, the diatremes are important as a source of xenoliths and megacrysts (discrete crystals or crystal fragments 0.5 cm or more across) which provide information on the composition of the mantle. The Sydney Basin Jurassic diatremes are the oldest known occurrences of such xenoliths and megacrysts (Johnson, 1989). The diatremes are also of interest botanically for their specific vegetation related to the locally enriched soils.

LEG considers the Sydney Basin Jurassic Diatremes are of national significance, and maybe even international significance. These remnant basalt caps include the northern high point (1254 m) of Mt Coricudgy, Nullo Mountain, Mount Cameron, Mount Budgary, Galah Mountain, Murray's Mount, Mount Colong, Mount Shivering, Mount Banks, Mount Hay, Mount Yengo, and many more. Geochemical data shows that most of the basalt (excluding Jurassic diatremes) erupted 15-20 million years ago (Van der Beek et al, 2001).

All places on the National Heritage and World Heritage Lists have a 'Statement of Significance' which succinctly describes their values. In relation to geodiversity values, a 'statement of significance' might be:

The Greater Blue Mountains are the best example in the World of a sedimentary upland, deeply dissected by rivers over tens of millions of years, and of the ongoing processes involved in sculpting these magnificent landforms'. The outcropping geology provides an outstanding illustration of the complex and long geological history of the east Australian coastal margin and highlights marine, terrestrial, volcanic and tectonic environments and processes through time. The geology also hosts exemplary erosional landforms/ elements including karst, caves, cliff lines, slot canyons, bottleneck valleys, pagodas and other sandstone landforms of national and international significance

The geomorphology is defined in the Australian Natural Heritage Charter (Cairnes, 1997) as the range of Earth features including geological, geomorphological, palaeontological, soil, hydrological and atmospheric features, systems and earth processes. The Greater Blue Mountains World Heritage Area (GBMWH) and associated complementary areas have geodiversity and geoheritage significance, that should now be recognised for both National and International Heritage listing. There are numerous geological and geomorphological features within the GBMWH such as the cliff line systems, scenic lookout features such as The Three Sisters, the pagodas and slot canyons that have national, and potentially international significance, associated with their aesthetic, scenic and interpretation qualities, with these extending to the margins and adjacent lands too. (Washington & Wray)

Aesthetics

The aesthetics of the Blue Mountains, with its significant visual 'blue haze' partly from the droplets of eucalyptus oil in the atmosphere, has been recognised since humans first arrived in the region (ref pp157 Values book). Another prominent atmospheric quality of the region, especially the main tourism region centred on Katoomba, is the occurrence of frequent mists and changing weather. This is mainly due to the proximity of the coast, a moist maritime climate and the orographic effect caused by the uplift of the mountains both regionally and locally in the form of cliffed valley escarpments. The location of so many lookouts and walking tracks on the rim of dramatic cliffs above forested valleys means that the swirling mists are readily accessible. Because of the scenic grandeur of the area, now the bedrock of the tourism industry, the Greater Blue Mountains has been recognised by the Commonwealth as a 'National Landscape'—these are 'places that capture the essence of our country—our most inspirational environments offering world class natural and cultural experiences' (ref: <https://www.dcceew.gov.au/parks-heritage/national-parks/national-landscapes-0>).

ADDITIONS TO GBMWA RESERVES SINCE 2000 LISTING

The GBMWA originally comprised eight conservation reserves. When the nomination for World Heritage listing was prepared in 1998 (prior to listing in 2000) the total area of these reserves was 1,032,649 ha. Only the area that was within the 8 reserves at the time of nomination are now included in the WHA. Since 1998, approximately 40,000 ha has been added to the constituent reserves. These additions currently have neither National nor World Heritage status and are proposed for assessment by the Australian Heritage Council. They should now be included.

LEG notes that most of the additions since 2000 have been in the Sydney Basin IBRA, arguably adequately reserved. However few areas have been added to the western GBMWA. This could now be addressed by the inclusion of –

- Muggi Murrumbidgee SCA
- Capertee National Park
- Gardens of Stone region and lands not included in the recent Gardens of Stone SCA declaration
- Maiyingu Marragu Reserve
- Hassans Walls Reserve
- Mount Clarence Reserve
- Zig Zag Reserve
- Hyde Park Reserve
- Dargan Creek Reserve
- Browns Swamp area at Clarence
- Nullo Mountain State Forest and Flora Reserve
- Coricudgy State Forest
- Goulburn River NP, The Drip and Corner Gorge now in Goulburn River State Conservation

ADDITIONAL AREAS

LEG supports all additional areas that the AHC is considering for inclusion in the National Heritage List. Newnes Plateau was originally included in the 2000 GBMWhA nomination but was excluded. This should now be addressed.

Including all of the Gardens of Stone SCA and those lands which were omitted (eg. Clandulla Geebung Offset Area near Cullen Valley Mine, Maiyingu Marragu Reserve) could conserve areas where Sydney Basin, South Eastern Highlands, and South Western Slopes IBRA Region's overlap on the eastern and western sides of the Great Dividing range, and headwaters of the Wollangambe River, Cocks River, Wolgan River, and Turon River catchments

In addition LEG believes that all Crown Lands in the Clarence/Dargan, Bell, Mount York, and Hartley areas that were part of the original Gardens of Stone Stage 2 proposal for inclusion in either in a Gardens of Stone SCA, Western Escarpment SCA, or Blue Mountains National Park. (ie. Dargan Creek Reserve, Mount Clarence Reserve, Zig Zag Reserve, Browns Swamp area, Mount York Reserve, and Hyde Park Reserve) should be included in the GBMWhA, to protect threatened flora species not currently protected in the NSW Conservation Estate eg. *Acacia meiantha*, *Asterolasia buxifolia*.

Conclusion

Thankyou for this opportunity to provide comment.

Yours faithfully

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