GREATER BLUE MOUNTAINS WORLD HERITAGE AREA

Summary of Natural & Cultural Heritage Information

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for

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CONTENTS

1. INTRODUCTION

This document was prepared as a product of the Interpretation and Visitor Orientation Plan for the Greater Blue Mountains World Heritage Area.

It is intended primarily as a summary reference of key information for use by those who are preparing public information and interpretation for the world heritage area.

It is not intended to be fully comprehensive and anyone requiring detailed information on any topic is encouraged to refer to the list of selected references and additional material not listed. It is also recommended that all facts quoted here are checked from primary sources.

A major source for this document was the *Greater Blue Mountains World Heritage Area Nomination* (see reference list), which is a very useful compendium of information but of limited availability. All other key sources used in compiling this summary are listed in the references, along with some other useful documents which were not consulted.

Some items of information contained here (eg. total area of wilderness and comparisons with other east coast wilderness areas) have been derived from original research for this project.

2. Essential Facts

- inscribed World Heritage on 29 November 2000
- accepted under World Heritage natural criteria II and IV – eucalypt/sclerophyll ecosystems and biodiversity
- 14th Australian World Heritage property
- 1.03 mill. ha = 10,000 sq km (nearly 4,000 sq. miles, similar to US state of Connecticut)
- 230 km N-S and up to 80 km E-W (140x50 miles)
- reaches within 60 km of Sydney centre
- one of the largest protected forest areas in Australia
- c.54% of WHA is declared wilderness:
  - Nattai ≈ 30,000 ha
  - Kanangra-Boyd ≈ 125,000 ha
  - Grose ≈ 38,000 ha
  - Wollemi ≈ 361,000 ha
  - Total ≈ 554,000 ha
- additional wilderness assessed (but not declared):
  - Yengo ≈ 105,000 ha
  - Murruin ≈ 28,000 ha
- total wilderness declared and assessed ≈ 687,000 ha or 67% of WHA
- includes two largest wilderness areas in NSW (Wollemi & Kanangra-Boyd) and largest wilderness on the Great Dividing Range and in eastern Australia between Cape York Peninsula and Tasmania (Wollemi)
- made up of 8 contiguous conservation reserves:
  - Yengo NP
  - Wollemi NP
  - Blue Mtns NP
  - Gardens of Stone NP
  - Kanangra-Boyd NP
  - Nattai NP
  - Thirlmere Lakes NP
  - Jenolan Karst Conservation Reserve
- up to 6 indigenous language groups have a traditional association with the area:
  - Darkinjung north-east
  - Dharawal south-east
  - Darug central east
  - Gundungara south
  - Wiradjuri central west
  - Wonnarua far north
- 700 recorded Aboriginal sites (1998)
- 100 eucalypt taxa (including *Eucalyptus, Corymbia* and *Angophora* genera) = 14% global total (of c.700 taxa total)

- c. 80 plant communities – sclerophyll (eucalypt), rainforest, heath and swamp/wetland
- 56 eucalypt-dominated communities
- c.1500 vascular plants (= more than Europe)
- 8% plants endemic to WHA
- 265 native birds (> one third of Australia's total)
- 52 mammals
- 62 reptiles
- 30 amphibians
- c.4000 moths (estimate)
- one endemic vertebrate – Blue Mountains Water Skink *Eulamprus leuraensis*
- c.160 rare/threatened plants + animals
- altitude range = c.10m to 1334m (Hawkesbury River to Boyd Plateau)
- annual precipitation range = c.500 mm to 1500 mm
- within daytrip range for 6 million people
- within the administrative boundaries of 14 local government areas

3. World Heritage Values

- represents and protects a significant proportion of Australia's scleromorphic, eucalypt-dominated ecosystems and their constituent biodiversity, both of which are globally important
- eucalypt ecosystems are of global importance particularly because of five unusual characteristics:
    - the dominance of scleromorphic species
    - dependence on and inter-relationship with fire
    - a high level of light transmission through the canopy
    - understories which are species-rich and highly variable
    - a high proportion of ant-dispersed plants
- the area's eucalypt-dominated forest communities are the most diverse and intact scleromorphic (hard-leaved) forests in the Earth's temperate zone
- the area's ecosystems demonstrate the continuing natural processes, especially a drying climate, that have changed Australia's vegetation over millions of years
- holds the best representation of the eucalypt-dominated ecosystems that dominate large parts of the Australian continent, occupying the zones between rainforest and arid environments
- the more recent scleromorphic vegetation exists beside important ancient species (such as the Wollemi pine) surviving from wetter Gondwanan times
- the eucalypt-dominated ecosystems are of exceptional variety, in part due to the area's complex and nutrient-deficient landscape
- the area has the greatest concentration of eucalypt diversity on the Australian continent, with 100 different types or 14% of the world total (March 2003), and is therefore a centre for the evolution of eucalypts
- diverse ecosystems include outstanding plant diversity (more than 1500 vascular plant species representing 10% of Australia's total and about 1% of the world's total) and a wide variety of animals, particularly invertebrates
- protects a very large number of endemic, relict, restricted, rare and threatened species, including 127 rare or threatened plants and 32 threatened animals
- the GBMWHA complements other Australian World Heritage areas which together represent a wide suite of the continent's distinctive ecosystems
- the area's large size (10,000 square kilometres), mostly wilderness condition and strong protective management strengthen the natural integrity of the area and the potential for long-term conservation of biodiversity.

4. Geography, Landscape and Climate

- the GBMWHA is a dissected upland plateau extending from the Southern Tablelands in the south to the Hunter Valley in the north, and from the Central Tablelands in the west to the Cumberland Plain in the east
- the WHA lies between the latitudes of about 32.5° and 34.5° south
- the altitude of the plateau surface ranges between about 1000 metres and 200 metres, falling from the uplifted Great Divide and Central Tablelands in the west towards the coastal lowlands around Sydney in the east and the Hunter Valley in the north
- in places where this fall is sudden, the plateau is edged by steep escarpments (eg. southern rim of the Hunter Valley)
- the Blue Mountains comprise a significant part of the Great Escarpment, a coastal scarp which has been traced the length of Australia's east coast
- in the north-east, the plateau extends beyond the WHA towards the coast
- numerous narrow gorges and steep ridges have been eroded into the plateau surface during the westward incision of eastward-flowing streams, creating a deeply dissected and topographically complex landscape
- there are few broad valleys within the area
- the lowest parts of the WHA lie close to sea level along the Nepean-Hawkesbury River in the central east, where the plateau falls to the western margins of the Cumberland Plain in Sydney's west
- another lowland section lies along the southern margin of the Hunter Valley in the north
- the highest section is the Boyd Plateau in the south-west which reaches 1334 metres altitude
- other highland parts include the Mount Werong plateau (1100 metres), Newnes Plateau (to 1180 metres) and peaks near the Great Divide in the central west and north-west (eg. Mt Coriaday at 1240 metres, the highest point in Wollemi—although Mt Coricudgy reaches 1256 metres nearby)
- the WHA occupies major parts of the catchments of the Hawkesbury-Nepean River (and several major tributaries) and the Hunter River
- small parts of the area extend across the Great Divide and drain to the west, into the Abercrombie River in the south-west corner and the Cudgegong River in the central west
- the diversity of topography has created a variety of local climates
- most of the area has a temperate maritime climate with prevailing weather from the east
- annual precipitation peaks at about 1500 mm around 800 metres elevation on the central eastern escarpment and falls away in all directions from there

- for inland areas at low altitude in the west and north, and some internal rainshadow areas, annual precipitation falls to as low as 500 mm
- temperatures vary widely, mainly according to elevation and distance from the coast
- temperatures vary over about 10°C across the WHA on any given day and also in mean annual minima and maxima.

5. Geology and Geomorphology

Rock Types

- the area falls entirely within the larger sedimentary structure of the Sydney Basin with its kilometre-thick Permian-Triassic sequence (290-230 million years old) of sandstones, shales and other sediments
- most of the WHA is made up of sub-horizontal layers of quartz sandstone, with associated sandy infertile soils which are often skeletal
- the sedimentary sequence dips gradually to the east, with Triassic Narrabeen Sandstone dominating the higher western areas (where the Hawkesbury has been removed by erosion) and Triassic Hawkesbury Sandstone dominating the lower eastern parts
- layers of siltstone and shale within the dominant sandstone sequence produce more enriched soils
- in some limited areas, thin layers of Wianamatta Group sediments (Triassic age) overlying the Hawkesbury Sandstone have survived
- beneath the Triassic sandstones, Permian shale measures including shale, mudstone, coal, oil shale, siltstone and chert are exposed in many of the deeper western valleys
- more recent (Quaternary) alluvium has been deposited along a number of the broader and more gently-sloping valleys, producing deep sands or richer soils where basalt or shales are the parent material
- the broadly level surface of the sandstone tablelands is punctuated by higher peaks of remnant basalt throughout the WHA but particularly in the north-west
- although some of the high volcanic peaks may have originated as, or be underlain by, volcanic necks (eruptive vents), most are remnants of once-extensive lava flows which covered large parts of the area about 18-14 million years ago (Miocene period)
- numerous explosive volcanic vents filled with breccia (called diatremes) occurred during the Jurassic (about 200 million years ago) have eroded into basins particularly in the central east and north-western parts of the WHA (where many are named as ‘craters’)
- the small areas of volcanic rocks generate the most fertile soils in the WHA and have, along with the broader alluvial valleys, been the focus of human exploitation for grazing and agriculture
- folded Ordovician, Silurian and Devonian metasediments of the Lachlan Fold Belt (450-350 million years old—the oldest rocks in the WHA) which underlie the Sydney Basin sediments are exposed in the Coxs, Kowmung and Abercrombie River catchments and parts of the Wollondilly and Capertee catchments
- in places (such as Kanangra Walls), Sydney Basin sediments lie uncomformably over the Lachlan Fold Belt strata
- narrow belts of Silurian limestone (formed as carbonate reefs in tropical seas) are a particularly significant component of the folded metasediments, producing the

karst landscapes of Jenolan Caves, Colong, Tuglow, Little Wombeyan, Billys Creek, Church Creek and Blue Rocks in the Capertee

- igneous rocks occur over small areas–granite on the Boyd Plateau (where basalt also occurs) extending into parts of the Jenolan River and upper Kowmung River, and porphyry on the Bindook Plateau
- the volcanic Bindook Porphyry originated from a Devonian volcano in the Yerranderie area
- most of the basement rocks produce nutrient-poor soils

Tectonic History

- the Lachlan Fold Belt rocks were deposited on a convergent tectonic plate margin on the eastern edge of the Australian continent before being deformed
- after a period of uplift and erosion, the area subsided and deposition of the Sydney Basin sequence on top of the Lachlan Fold Belt began, the sediments accumulating in a subsiding marine basin wedged between the older Australian continent to the west and a volcanic island arc to the east
- the Permian strata were deposited at a time when Australia was close to the South Pole, and some sediments towards the base of the sequence show signs of glaciation
- the oldest marine sediments are overlain with coal measures that originated in swamps and lakes that formed as the sea retreated
- river sedimentation followed, with the Narrabeen Sandstone eroding from volcanic rocks of the island arc
- the quartz sands of the Hawkesbury Sandstone may have originated as sediment washed from the Transantarctic Mountains (when Antarctica was attached to Australia) by a massive river system
- the sandstones and shales of the Wianamatta Group were the last sediments of the Sydney Basin
- about 50 million years ago Antarctica separated from the east coast of Australia
- about the same time as Antarctica and Australia split, or some time later (the timing is still debated by scientists), the Eastern Highlands, including the Blue Mountains, were uplifted in response to large movements of the Earth's crust
- the crustal movements were associated with the development of a divergent tectonic plate margin as Australia began to split from New Zealand (and which later resulted in the opening of the Tasman Sea)
- the uplift was most abrupt on parts of the eastern margin, where steeply-dipping beds of sandstone can be seen today (eg. Lapstone, Kurrajong)
- the flexing associated with the uplift probably generated the marked rectilinear jointing pattern in the sandstones, which has strongly influenced drainage patterns (many streams are joint-controlled)

- many streams maintained approximately their previous course during the uplift, and continued to incise deeper into the plateau
- the uplift disrupted some other streams, reducing gradients (and therefore down-cutting ability) and in some cases reversing flows
- Mellong Swamps and Bindook Swamps may owe their origin to disrupted drainage resulting from uplift
- Thirlmere Lakes occupy an old river meander which became abandoned due to earth movements which may have occurred well after the main uplift

Landforms

- the WHA is comprised of two major landforms—the Blue Mountains Plateau that takes up most of the area and the smaller Hornsby Plateau to the north-east which takes in Yengo NP and also extends to the east and south-east
- the incised plateau landform developed as the steep coastal edge of the uplifted eastern Highlands was eroded by eastward-flowing streams
- the steep eastern scarp of the Blue Mountains is part of a much larger feature—the Great Escarpment—that extends the full length of Australia's east coast
- the other very extensive feature of the region is the western cliffed sandstone escarpment of the Blue Mountains Plateau that extends, in very convoluted form, from the Hunter Valley to the tablelands of the Nattai
- current scientific opinion is unclear as to the age of the erosional surface, which may go back up to 90 million years or be much more recent (eg. the basalt lava flows which would have poured into the then valleys now lie on mountain-tops but have been dated at only 14-18 million years old)
- the landscape of the western and south-eastern WHA is dominated by extensive, dissected tablelands of Narrabeen Sandstone falling into valleys of Permian sediments
- streams that are entirely confined within the Narrabeen Sandstone layers (have not cut down into the softer Permian rocks) typically occupy narrow cliffed gorges
- larger valleys in the Narrabeen-dominated landscapes that penetrate the Permian strata typically have vertical, strongly jointed and often continuous sandstone cliffs (up to 300m in height) overlying gentler slopes of softer Permian rocks
- local relief in the Narrabeen-dominated landscapes ranges from 300m to 600m
- slot canyons are a special feature of the Narrabeen gorge system, with several hundred having been recorded
- pagoda formations are another special feature, occurring on the western part of the Narrabeen Sandstone, notable in the Newnes Plateau, Gardens of Stone NP, Wolgan-Capertee valleys and Dunns Swamp areas
- landscapes dominated by Hawkesbury Sandstone in the east of the WHA display much exposed rock over the full relief from plateau to valley bottom

- Hawkesbury Sandstone clifflines and outcrops are more blocky and broken and less continuous than their Narrabeen counterparts because of more irregular jointing patterns and frequent siltstone lenses
- local relief in the Hawkesbury-dominated landscapes ranges from 100m to 400m
- higher basalt peaks standing above the general level of the sandstone plateau may increase local relief
- in areas where diatremes are common, the typical sandstone physiography may be disrupted by crater-like valleys and resistant ridges of sandstone hardened through heat
- the deformed metasediments of the Lachlan Fold Belt produce a landscape of sharp ridges with steep, flat slopes and occasional discontinuous cliffs and outcrops associated with fold structures and more resistant strata
- local relief in metasediment-dominated landscapes ranges from 300m to 1000m
- the igneous landscapes are generally more rounded with some extensive granite outcrop in stream-beds and as tors on the Boyd Plateau
- karst landforms have developed in a number of small limestone areas in the WHA (Jenolan, Tuglow, Lannigans Creek, Church Creek, Billys Creek, Little Wombeyan Creek, Murruin Creek, Blue Rocks) and display a wide variety of caves and other surface and underground solutional and depositional features
- Jenolan is one of the most extensive cave systems on the Australian mainland, and regarded as one of the most densely cavernous sites in the world
- small lakes and valley infills (some with associated lakes or filled lakes) occur in several parts of the eastern WHA where earth movements have disrupted drainage, eg. Bindook Plateau, Boyd Plateau, central Blue Mountains and Mellong Range
- geomorphic features of special significance include:
    - Thirlmere Lakes
    - talus lakes (and infilled lakes) of the Grose and Wolgan Valleys
    - slot canyons
    - pagoda terrain
    - diatremes
    - karst areas/caves
    - upland valley swamps/infills (eg. Mellong swamps)
    - clifflines
    - pinnacles and towers (eg. Three Sisters, Yodellers Range)
    - basalt peaks (eg. Yerranderie, Colong, Shivering, Banks, Hay, Cameron, Gospers, Wirraba, Coriaday, Monundilla, Kerry, Pomany, Wareng, Yengo)

Hydrology

- main drainage systems with named rivers east of the divide are the Little, Nattai, Kowmung, Jenolan, Coxs, Kedumba, Grose, Wollangambe, Wolgan, Capertee, Colo, Macdonald (all tributaries of the Hawkesbury-Nepean) and tributaries of the Hunter

- the Abercrombie and Cudgegong Rivers drain the small areas of the WHA that lie west of the Great Divide
- all main streams and many tributaries flow for some or all of their length within the WHA through steep-sided gorges which are one of the main scenic features of the region
- large parts of the catchments of all major WHA streams lie outside the WHA and are highly modified, leading to changed flow regimes, increased sedimentation and weed transport
- the Capertee-Colo River Gorge is sometimes described as the longest gorge in Australia (it is c.100km in length within the WHA, plus another c.10km upstream)
- waterfalls up to 200m in height are common in escarpment areas, mostly in the central Blue Mountains and around the edges of the Boyd Plateau (places which also receive high precipitation)
- wetlands are common on upland plateaus where low local relief and minimal slope act to impede drainage–particularly in the Mellong Swamps, central Blue Mountains, Boyd Plateau and Bindook Plateau
- wetlands also occur in some river valleys where mass slope movements (eg. Grose Valley) or alluvium deposits (eg. Cudgegong Valley) impede drainage
- Thirlmere Lakes form a unique wetland system with its genesis in tectonic movements affecting drainage
- stream flows within the WHA are highly variable–frequently low but with occasional severe floods
- water quality is generally good to high, with a number of large catchments which are either pristine or largely intact, eg. Martins, Murruin, Kanangra, Butchers, Erskine, Cedar, Bungleboori, Nayook, Rocky, Girribung, Coorongooba, Ovens, Wollemi, Blackwater, Martindale and Yengo Creeks
- a significant part of the southern WHA contributes clean runoff to Lake Burragorang, Sydney's major water supply storage
- the WHA contributes water to a number of other water storages and extraction points outside the WHA
- the karst hydrology of the various limestone areas within the WHA is of particular significance

6. Vegetation

- the plant life of the WHA is representative of Australia's globally unique scleromorphic vegetation, born of long isolation and progressive drying of the climate on what is now the most arid, climatically variable, fire-prone, geologically stable and nutrient-poor continent not under ice
- Australia's modern scleromorph-dominated flora developed mainly during the Tertiary from the moisture-loving Gondwanan flora
- in the WHA, the more recent scleromorphic vegetation co-exists with important elements of the ancient Gondwanan flora
- the juxtaposition of relict Gondwanan species and vegetation types with the profuse and diverse evolutionary products of post-Gondwanan environmental change makes the WHA of outstanding significance in the evolution of plant life
- the vegetation has a high level of diversity at both the specific and community level, exemplified in areas with a rapid turnover of both species and communities along environmental gradients
- plant and community diversity have developed mainly in response to a high level of environmental variation at both a broad and a fine scale (eg. soil moisture and fertility, aspect) and the variation in fire regimes
- because of its outstanding diversity, the area exhibits the full range of dynamic interactions between eucalypts, understorey, environment and fire
- these interactions range from tall valley forests in which eucalypts form a dynamic boundary with co-existing rainforest, to communities in which shrub-sized mallees co-exist with rich and equally flammable heaths on frequently-burned sandstone plateaus

Communities

- about 90 different plant communities have been recognised in the WHA (Bell [1998] recognised 72 communities in Wollemi NP alone)
- 56 communities of eucalypt-dominated open-forests and woodlands dominate most of the WHA
- other communities exist in small patches amongst the sea of eucalypts, including 13 communities of mallee, scrub, heath and sedgeland (many of which are also eucalypt-dominated) and another 18 eucalypt-free communities of subtropical, dry, warm temperate and cool temperate rainforest
- approx. half of the plant communities are restricted in distribution and unique to the region
- many of the restricted communities of conservation significance occur on rock substrate of limited occurrence, such as Bindook Porphyry, basalt, alluvium, limestone and Wianamatta shale
- rainforest and tall open-forest communities occur mainly on the more fertile soils derived from Permian sediments, alluvium and basalt

- some high altitude basalt caps support an unusual warm temperate rainforest which lacks *Ceratopetalum apetalum* (coachwood) and is dominated by *Doryphora sassafras* (sassafras) and *Quintinia sieberi* (possumwood)
- subtropical rainforest is very restricted, occurring on basalt soils at Green Scrub (south-east Wollemi) and the head of Widden Brook (north-west Wollemi)

Floristics

- the WHA contains more than 1500 vascular plant species (although Bell [1998] reported 1560 species for Wollemi NP alone, and the 2003 survey of the 260,000 hectare Warragamba Special Area [which includes lands outside the WHA] recorded more than 1400 native plants)
- the flora is also outstandingly rich at the family (152 families) and generic (484 genera) levels
- almost all species are endemic to Australia and 8% are confined to the WHA
- the WHA contains the most diverse temperate forests in Australia, and perhaps on the globe
- the WHA contains 100 known eucalypt taxa, representing 14% of the global total of some 700
- 75 eucalypts have been recorded for the Warragamba Special Area, 28 on the 10,000 hectare Bindook Plateau and 65 in the Katoomba 30' by 30' grid rectangle
- the high diversity is related to the geographic location and the diversity of available habitats
- 6 eucalypts are endemic to the WHA
- the WHA contains 64 Acacias (of Australia's more than 900 species and 1200 world-wide)
- species richness at the 1-15m^2 scales in heaths adjacent to the WHA are some of the highest recorded for anywhere in the world (similar heaths within the WHA can be expected to display similar levels)

Special Flora

- 114 plant species and sub-specific taxa are endemic to the WHA, most of which are associated with the fire-prone sclerophyll flora of the infertile sandstone plateaus
- local endemism at the generic level includes *Wollemia, Acrophyllum, Apatophyllum, Rupicola, Allania, Atkinsonia, Leionema* (not entirely within the WHA)
- 127 vascular plants are listed as rare (ROTAP) or threatened (TSC Act), half of which are solely or mainly confined to the Blue Mountains
- 3 threatened plants are in monospecific genera: *Wollemia nobilis, Atkinsonia ligustrina, Acrophyllum australe*

- *Microstrobos fitgeraldii* is a member of a genus with only two species

7. Fauna

- the diversity of landscape and the floristic and structural variety of the vegetation supports a high diversity of fauna
- the WHA contains more than 400 native vertebrates:
    - 52 mammals
    - 265 native birds (more than one third of Australia's total)
    - more than 60 snakes and lizards and 2 tortoises
    - more than 30 frogs
- introduced species include 13 mammals and 10 birds
- at least 32 WHA vertebrates are threatened (TSC Act), including 7 bats, 5 other mammals, 15 birds, 3 reptiles and several frogs
- the range of most threatened vertebrates extends beyond the GBM
- only one vertebrate is endemic to the GBM—the threatened Blue Mountains Water Skink *Eulamprus leuraensis* which is confined to swampy heathland in the central Blue Mountains uplands (both within and outside the WHA)
- 5 mammals are considered to have become extinct in the area since 1788, and a further 6 birds and mammals have been historically recorded for the area but have not recently been recorded
- invertebrates are poorly known but are expected to be very diverse—it is estimated that about 120 butterflies and 4,000 moths might occur in the GBM
- up to 25 invertebrate species have been considered to be of conservation significance, including the copperwing butterfly (listed as threatened) and giant dragonfly
- other interesting invertebrates include a wide variety of cicadas, glow worms (*Arachnocampa richardsae*), the diamond-back slug (*Triboniophorus* sp.) and cave-dwelling invertebrates (which include several 'primitive' species)
- the invertebrate fauna of Jenolan Caves is one of the richest in temperate Australia, with 67 taxa

8. Aboriginal Cultural Heritage

- many Aborigines believe they have been in Australia forever, with the earliest scientifically recorded occupation date in the WHA at 14,000 years (and perhaps 22,000 years) for a shelter at Kings Tableland (central Blue Mountains)
- other dates of around 12,000 years have been obtained at other sites in the central Blue Mountains
- an as yet unconfirmed date of up to 50,000 years has been obtained for artefacts found in the Nepean River gravels at the foot of the escarpment
- throughout their tenure in Australia, Aboriginal societies continued to adapt and change in response to climatic change and other pressures
- Aboriginal occupation of the mountains increased significantly in the past 5000 years, corresponding with other changes including the arrival of the dingo, the introduction of new stone tool technology and the stabilisation of the sea at about its current level following its rise after the last ice age
- physical evidence of Aboriginal occupation exists throughout the WHA in at least 700 recorded sites which include grinding grooves, stone arrangements, spiritual sites, rock engravings, other rock art, shelters with occupation deposit, other occupation sites, artefact scatters and scarred trees
- the recorded sites, partly reflecting the distribution of recording effort, are most concentrated in Yengo NP and the central Blue Mountains
- the rock art of the region occurs in shelters and on platforms and is particularly rich, representing a wide range of motifs and styles, and new discoveries continue to be made (such as the major Eagle's Reach site in Wollemi NP recorded in 2003)
- most of the rock art seems to date from the period 4,000-1,000 years BP, and there are examples of contact art
- the 7 language groups with attachment to parts of the WHA at the time of white settlement are as follows:

- Darkinjung	north-east
- Darug	central east
- Dharawal	south-east
- Gundungara	south
- Kamilaroi	north-west
- Wiradjuri	central west
- Wonnarua	far north

- all Aboriginal groups in the Sydney region were severely depleted in the early years of white settlement, through disease, displacement and violence, but some groups continued to live close to country into the 20th century
- all the above groups, as well as Aboriginal administrative structures such as Land Councils, continue to maintain interests and links with country today
- although ethnographic records from the contact period are limited, some useful information from early explorers, observers and anthropologists exists to illustrate material culture, lifestyle and beliefs—eg. foods and materials used

- most white exploration of the region was assisted by Aboriginal guides and/or information from local or adjacent groups
- evidence suggests that a number of the main modern transport corridors were traditional Aboriginal pathways used for trade and travel (eg. Putty Road, Bells Line of Road, Great Western Highway)
- the Aborigines managed and shaped their environment through a number of means, including ceremony and more direct practices such as the use of fire, promotion of favoured species and habitat manipulation
- the significance of pre-contact Aboriginal burning practices in changing and/or maintaining the distribution and character of vegetation communities remains controversial amongst scientists, however it is almost certain that at least some of the more fertile areas were maintained as grassy woodlands to encourage important game species such as macropods

9. Non-Aboriginal Cultural Heritage

- major historic themes expressed in the WHA include European exploration, settlement, convict construction, transport, pastoralism, timber-getting, mining, tourism, water supply and other utilities, recreation, scientific research and conservation
- the main phase of white exploration of the WHA lasted from 1789 (when William Dawes crossed the Nepean River) to 1823 (when Archibald Bell traversed the Bell Range), but investigation and accurate survey of the most remote and rugged parts continued well into the 20th century
- white exploration has always been driven by a combination of commerce, scientific curiosity and adventure
- during the early phase all the modern transport corridors across the area were found (with the help of Aboriginal information and guides)—the Great Western Highway (Coxs Road), Bells Line of Road, Putty Road (Howe's Track) and Wollombi Road
- the main transport routes were steadily constructed from 1815 (Coxs Road) to the World War II years, when the Putty Road and Bells Line of Road were upgraded into modern roads
- the Old Great North Road (constructed 1826-1831), which borders the WHA along the shared boundary of Yengo NP and Darug NP, was a major achievement of this period and is now an important relic of convict construction
- settlement of the region followed hard on the heels of the explorers, with colonists officially and unofficially seeking out productive pastures and farmlands
- settlers were well established on the Nepean River by 1795, and many of the more accessible mountain valleys were settled in the 1820s—Euroka, Hartley, Megalong, Kanimbla, Wolgan, Burragorang, Cudgegong, Capertee
- even the remote Bindook Highlands were taken up by 1827, but some areas such as Widden Brook, Bylong and Putty were not settled until the 1830s
- from the numerous settled areas, graziers penetrated into more remote parts of the mountains, seeking out pockets of fertile soil—mostly in the southern Blue Mountains but also in the north
- remote holdings in parts of the south such as Kanangra Creek, Kowmung River and Butchers Creek were taken up in the 1860s
- in the northern patches of basalt, Nullo Mountain was taken up in 1840 and Uraterer (Gospers) Mountain in 1877
- the 1850s goldrush to the central west prompted further development of the mountains
- the completion of the western railway across the mountains to Lithgow in 1869 and to Bathurst in 1876 was another major spur to development
- after the railway came tourist establishments, and wealthy gentlemen began to develop country estates on the central Blue Mountains ridge and at Mt Wilson

- the main phase of development of the extensive recreational walking track system of the Central Blue Mountains, along with lookouts and other facilities, lasted from 1885 to 1910 and continued until the middle of the 20th century with few additions since
- coal and oil shale mining began in the 1850s at Hartley Vale and remains an important industry around the fringes of the WHA today
- early mining developments occurred in the later decades of the 19th century in the Megalong, Jamison and Grose valleys and at Mt Airly
- the massive oil shale operation at Newnes in the Wolgan Valley ran intermittently from 1905 to 1932, oil shale was mined at Baerami Creek around the same time, and Glen Davis operated from 1940 to 1952
- in 1871 two Gundungara men found galena ore at Yerranderie, where a major silver-lead-zinc mining operation lasted from 1898 to the 1930s
- apart from coal, oil shale and Yerranderie, mining in the WHA has been limited to a few small operations
- timber-getting has taken place in many parts of the WHA, commencing with cedar-cutting along the Hawkesbury in the 18th century and continuing until very recent years when areas subject to logging were transferred to the conservation estate—Boyd Plateau, Mt Werong, Newnes Plateau, Putty Road, Yengo
- cedar-cutting continued in remote parts of the Kowmung valley until after World War II
- since the mid-18th century, various transport, water supply and hydro-electric schemes have been advanced to exploit the wild valleys of the Coxs, Kowmung, Grose and Colo, but only Warragamba Dam ever eventuated
- Warragamba Dam, Sydney's major water supply, was completed in 1960 and flooded the Burragorang Valley which had been prized by indigenous people and new settlers alike
- recreation and tourism have been major themes in the WHA throughout the past century, especially in the central Blue Mountains where many facilities constructed over a century ago are still in use
- major historic features within the WHA include:
    - explorers' routes
    - remains of early transport routes, eg. Old Settlers Trail (Yengo), Newnes Railway
    - mining and industrial sites at Newnes, Baerami, Yerranderie and scattered locations in the Grose and Jamison Valleys
    - relics associated with prior grazing, farming and logging, eg. Boyd Plateau, Sheepskin Hut (Wollemi), Burralow Creek
    - water supply installations at Dunns Swamp
    - recreational features, eg. walking tracks, lookouts

10. Conservation History

- although some individuals spoke out for protection of native plants and animals during the 19th century, formal conservation did not commence until the middle of the century—and then it was more for reasons of public enjoyment, water catchment and other utilitarian purposes rather than protection of nature as such
- with the passage of the Crown Lands Alienation Act in 1861, which allowed anyone the opportunity to purchase land, the need to retain certain features in public ownership was recognised and put into effect by 'reserve from sale' provisions
- the first areas reserved (from sale) in the GBM were Wombeyan Caves (in 1865) and Jenolan Caves (in 1866) and these reserves have survived to the present day
- other cave reserves followed in the 'beauty spot' style of the day—Tuglow in 1878 and Colong in 1899
- many other 19th century reserves did not survive competing demands, including reserves along the new (1867) western railway which were progressively reduced
- one important early reserve of at least 17,000 hectares (1875) protected parts of the upper Grose Valley, and this, together with the cave reserves and some others, did survive in some measure to form part of the modern national park system
- although The National Park (now Royal NP) was created in 1879 and Ku-Ring-Gai Chase NP in 1894, 'modern' conservation thinking as we would recognise it today did not emerge until after 1910, when Myles Dunphy and colleagues began to consider and research large wilderness-style reserve proposals, in the Blue Mountains and elsewhere
- the successful Blue Gum Forest campaign of 1931-32 (Australia's first significant wilderness protection campaign) provided a major impetus to Dunphy's plans and began the 'bushwalking conservation' movement
- in 1932 Dunphy submitted to the authorities his ambitious plan for a Blue Mountains National Park taking in all the wild country from Nattai to the Wirraba Range in four sectors
- in 1933 the National Parks and Primitive Areas Council was formed, under Dunphy's leadership, to press for national parks in the Blue Mtns and elsewhere
- also in 1933, W.J. Balzer independently lobbied for a 'species park' in the upper Grose (perhaps one of the earliest reserve proposals based on biological conservation) and achieved a 'district' under the Animal and Birds Protection Act
- in 1934 the NPPAC published the 'Blue Mountains National Park Special Supplement' in the *Katoomba Daily* newspaper—a detailed claim for 460,000 hectares and a wilderness manifesto that has remained influential to this day
- the next success for the BMNP campaign was a 38,870 hectare reserve created in 1937 around Kanangra Creek (and which may have been related to fledgling plans to develop Warragamba Dam)

- progress through the war years was slow, but in 1959 a 'public recreation reserve' of about 63,000 hectares was proclaimed in two pieces in the Grose Valley and Blue Labyrinth—and called Blue Mountains National Park
- the Blue Gum Forest reserve was added to BMNP in 1963 and the Wollangambe 'Wilderness' in 1965
- when Warragamba Dam was completed in 1960, the Water Board took control of a large area in the southern Blue Mountains which remained contentious with the conservation movement and was progressively transferred to national park management—the last in 2002
- a 1963 proposal to quarry limestone at Mt Armour within the 1899 Colong Caves reserve became the first NSW conservation issue to involve the wider community and to impact politics
- the successful Colong campaign was a seminal event that laid the groundwork for all subsequent wilderness protection campaigns in Australia and gave birth to the influential Colong Foundation
- meanwhile in 1967 the National Parks and Wildlife Act was passed to officially establish both national parks as a land tenure and the NPWS, and in 1969 Kanangra-Boyd NP was created over the 1937 reserve
- in 1974 the Colong lease was surrendered and added to Kanangra-Boyd NP, and in 1977 the Boyd Plateau was added after a proposal to plant the area to pines was defeated
- these conflicts between development proposals and national park declarations were the first of many throughout the Blue Mountains which led to the progressive expansion of the reserve system in the last three decades of the 20th century as public support grew and the processes of government developed to deal with resource conflicts
- the GBM reserve system steadily grew to the end of the century to encompass the far north, the south east (Nattai) and the north-east (Yengo)

Some Key Dates in the Development of the Greater Blue Mountains Reserve System

1865	Wombeyan caves reserved
1866	Jenolan Caves reserved
1867-1890s	a number of small areas reserved in central Blue Mtns
1875	large area of upper Grose Valley reserved
1891	Reserve for Public Recreation created over Kanangra Walls
1899	Colong Caves Reserve created
1920s	Myles Dunphy begins NP plans
1926	Red Hands Cave (Glenbrook) reserved
1931	Blue Gum Forest campaign begins
1932	Blue Gum Forest reserved (2 Sept)

1932	Dunphy submits BMNP plan (June)
1933	Bird and Animal Protection District created in upper Grose
1934	*Katoomba Daily* publishes BMNP supplement (August)
1935-37	NPPAC proposes Bindook-Colong Marsupial Park
1937	reserve centred on Kanangra Creek created (October)
1938	development of Warragamba catchment for water supply approved
1939	application to extract limestone from Colong Caves Reserve rejected
1940	Kanangra Walls Road completed (allowing logging of Boyd Plateau)
1957-58	destructive fires in southern Blue Mtns, followed by extensive fire trail construction
1959	Erskine State Forest of 10,000 ha gazetted in Blue Labyrinth (11 Sept)
1959	Blue Mountains NP proclaimed over part Grose & Blue Labyrinth (25 Sept)
1960	Warragamba Dam completed, large protected catchment proclaimed
1961	Kanangra-Boyd NP proposed over 1937 reserve
1963	Blue Gum Forest reserve added to BMNP
1963	Proposal to quarry limestone from Colong Caves Reserve
1965	Wollangambe 'Wilderness' addition to BMNP
1967	National Parks and Wildlife Act passed, NPWS established
1968	Colong Committee formed to campaign against Colong quarry
1969	Kanangra-Boyd National Park gazetted (initial area)
1970	Colong Committee expands campaign to oppose pine-planting and logging on Boyd Plateau
1972	Thirlmere Lakes NP gazetted
1973	State Pollution Control Commission public inquiry recommends against proposed gas pipeline through Wollangambe Wilderness
1974	the surrendered Colong mining lease added to KBNP (March)
1974	Colo Committee formed to campaign for large national park in northern Blue Mtns
1975	SPCC inquiry recommends against pine planting on Boyd Plateau
1976	Helman report into wilderness in eastern NSW published
1976	Greater BMNP proposal published by National Parks Association (December)
1977	SPCC inquiry recommends against shale mining on Culoul Range
1977	Konangaroo State Forest (Boyd Plateau) revoked and added to KBNP (July)
1977	large part of Warragamba catchment added to BMNP (to be jointly managed)
1977	Pantoneys Crown Nature reserve gazetted
1978	Electricity Commission investigates power station on Newnes Plateau with dam on Colo River
1979	Wollemi NP (502,000 ha) gazetted (to the centre of the Earth to prevent mining) (14 Dec.)
1984	Gardens of Stone NP proposed (initially as western extension of Wollemi NP)

1987	Wilderness Act passed
1987	Colong Foundation submits proposal for Nattai NP with wilderness core
1988	Yengo NP (c.150,000 ha) gazetted (March)
1988	Colong Foundation nominates Kanangra-Boyd Wilderness
1989	Colong Foundation publishes *Blue Mountains for World Heritage*
1991	Nattai NP (47,504 ha) with 29,822 ha wilderness (1st in NSW) and 4 adjoining State Recreation Areas gazetted (Dec)
1991	legislation prohibiting mining under national parks passed
1994	Gardens of Stone NP (17,780 ha) declared (30 Nov)
1994	Royal Botanic Gardens report on Blue Mountains World Heritage
1995	Colo Committee nominates Wollemi Wilderness
1995	Pantoneys Crown Nature Reserve added to Gardens of Stone NP (22 Dec)
1996	Confederation of Bushwalking Clubs nominates Grose Wilderness
1997	Kanangra-Boyd Wilderness (111,000 ha) gazetted
1998	World Heritage nomination for Greater Blue Mountains Area submitted (June)
1999	first World Heritage nomination fails
1999	Wollemi Wilderness (361,000 ha) gazetted
2000	re-submitted World Heritage nomination is successful (29 November)
2001	Yengo Wilderness assessed by NPWS
2002	Grose Wilderness (38,000 ha) declared, including part of Blue Gum Forest
2002	Murruin Wilderness assessed by NPWS
2002	inner Warragamba catchment added to BMNP*

* Note: NP additions since the World Heritage inscription are not included in the WHA

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