Department of Environment and Science

Undara Volcanic National Park

Resource Information

2023

Queensland Government

This resource information was prepared by Queensland Parks & Wildlife Service (QPWS), Department of Environment and Science.

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Front cover photo: Undara Volcanic National Park landscape © Department of Environment and Science. 2018.

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1. Introduction

The Department of Environment and Science recognises, respects and values First Nations peoples and cultures. We recognise First Nations rights and interests in the Country on which we walk, work and live. We are committed to progressing self-determination by working in genuine partnerships with First Nations peoples to incorporate their priorities and perspectives across our decision-making and operations. The *Gurra Gurra Framework 2020–2026* prioritises and accelerates this commitment, guiding the agency to embed Country and people at the centre of all that we do.

The QPWS management planning process aligns with the Values-Based Management Framework (VBMF), an adaptive management cycle that incorporates planning, prioritising, doing, monitoring, evaluating and reporting into all areas of our business (Figure 1). Management plans and statements set the strategic management direction, guiding the next tier of planning and the development of thematic strategies, which in turn inform and prioritise our on-ground operations.

Resource information is a compendium of park information and a supporting document for management plans and management statements. It contains background information about a park's purpose, values, resources, and legal and administrative framework.

Information about the VBMF is available on the Department of Environment and Science (DES) website at www.des.qld.gov.au.

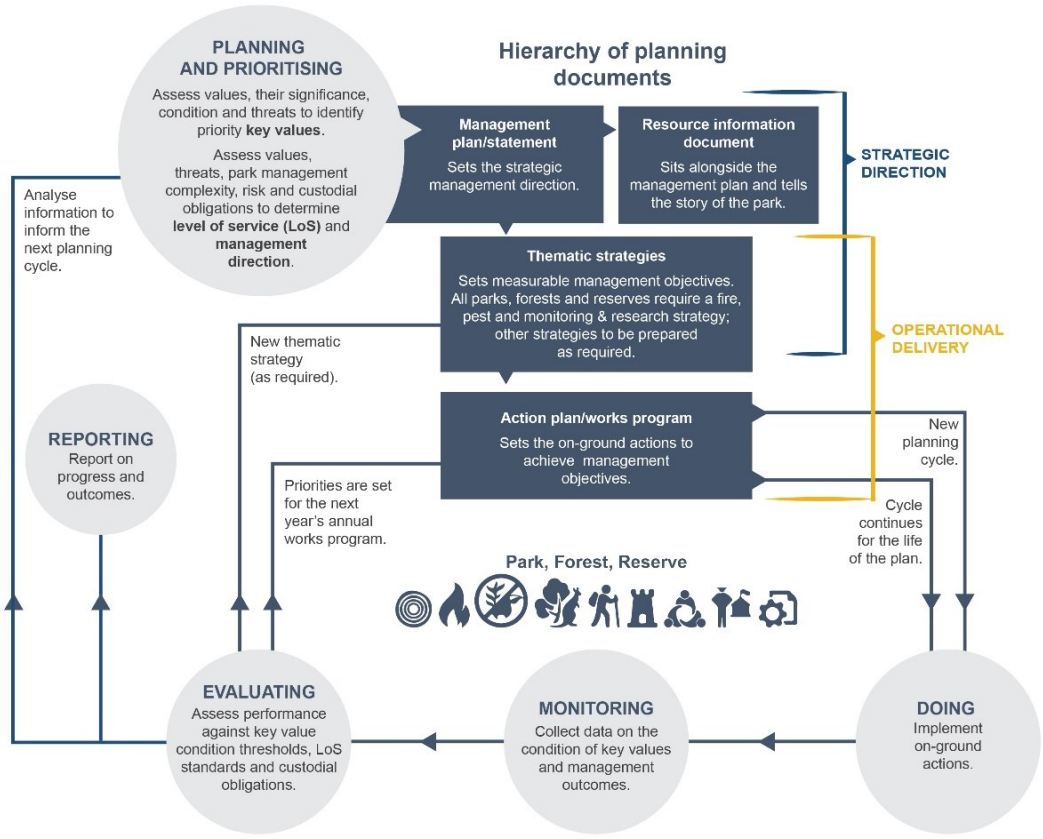

Figure 1. Phases of the VBMF cycle for planning and the hierarchy of planning documents

2. Undara Volcanic National Park

Undara Volcanic National Park was gazetted in 1989 as a 600 hectare national park covering part of the geologically and botanically significant Undara Crater. Subsequent additions have incorporated 60 lava tube caves, 43 additional volcanic vents, several perennial springs and an area of granite hills, increasing its size to 68,313 hectares. It was officially opened in 1992.

The park is located south-west of the intersection of the Gulf and Kennedy development roads, approximately 30 kilometres east of Mount Surprise (Figure 2). Most of the park is within Etheridge Shire, with the north-eastern part of the park extending into the Tablelands Regional Council area. The park covers part of the McBride Plateau, and its elevation averages approximately 800 metres, ranging from 500 metres along its western boundary to just over 1000 metres at the Undara and Racecourse craters (Queensland Government, 2000).

Undara Volcanic National Park's geology is its outstanding feature. It showcases a variety of volcanic vents and the longest and best examples of lava tubes in Australia. Most of the park is basalt, with granite intrusions and other minor rock types in the north-west.

The park is within the Einasleigh Uplands Bioregion. Most of the park is covered with grassy eucalypt woodland, with areas of deciduous low woodland on granite in the north-west of the park. Semi-evergreen vine thickets are associated with lava tubes and some craters. There are important perennial springs in the west of the park.

Undara Volcanic National Park is part of the traditional lands of the Ewamian People. Their cultural heritage includes stone implements and scarred trees, often associated with lava tubes, vine thickets and springs.

Undara Volcanic National Park is a regionally significant visitor attraction, with approximately 30,000 visitors per year. Visitor infrastructure includes boardwalks in four caves (lava tube sections), the Kalkani day-use area, and a number of walking tracks extending into the park from the adjoining Undara Experience Lava Lodge. Visitor access into the lava tubes is guided-only for protection of both visitors and the fragile environment. Most visitors enter the park from the Undara Experience Lava Lodge adjoining the park's northern boundary. The lodge offers a range of accommodation and guided tours to the caves and other features. Guided tours are also offered by Savannah Guides as part of an experience provided by Bedrock Village, located in Mount Surprise. Visitor infrastructure and the Yaramulla ranger base are confined to the northern part of the park (Queensland Government, 2000).

The legislative framework for managing the park, designations over the park and management obligations are outlined further in **Appendix 1**.

Bioregion	Einasleigh Upland		
Area	68,313 ha		
Local government area	Etheridge Shire Council	**State Electorate**	Kennedy
Management obligations	Convention of Migratory Species (CMS) China–Australia Migratory Bird Agreement (CAMBA) Japan–Australia Migratory Bird Agreement (JAMBA) Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) *Native Title Act 1993* (Qld) *Queensland Heritage Act 1992* (Qld) 1999 Burra Charter *Aboriginal Cultural Heritage Act 2003* (Qld) *Land Act 1994* (Qld) *Biosecurity Act 2014* (Qld) *Stock Act 1915* (Qld)		

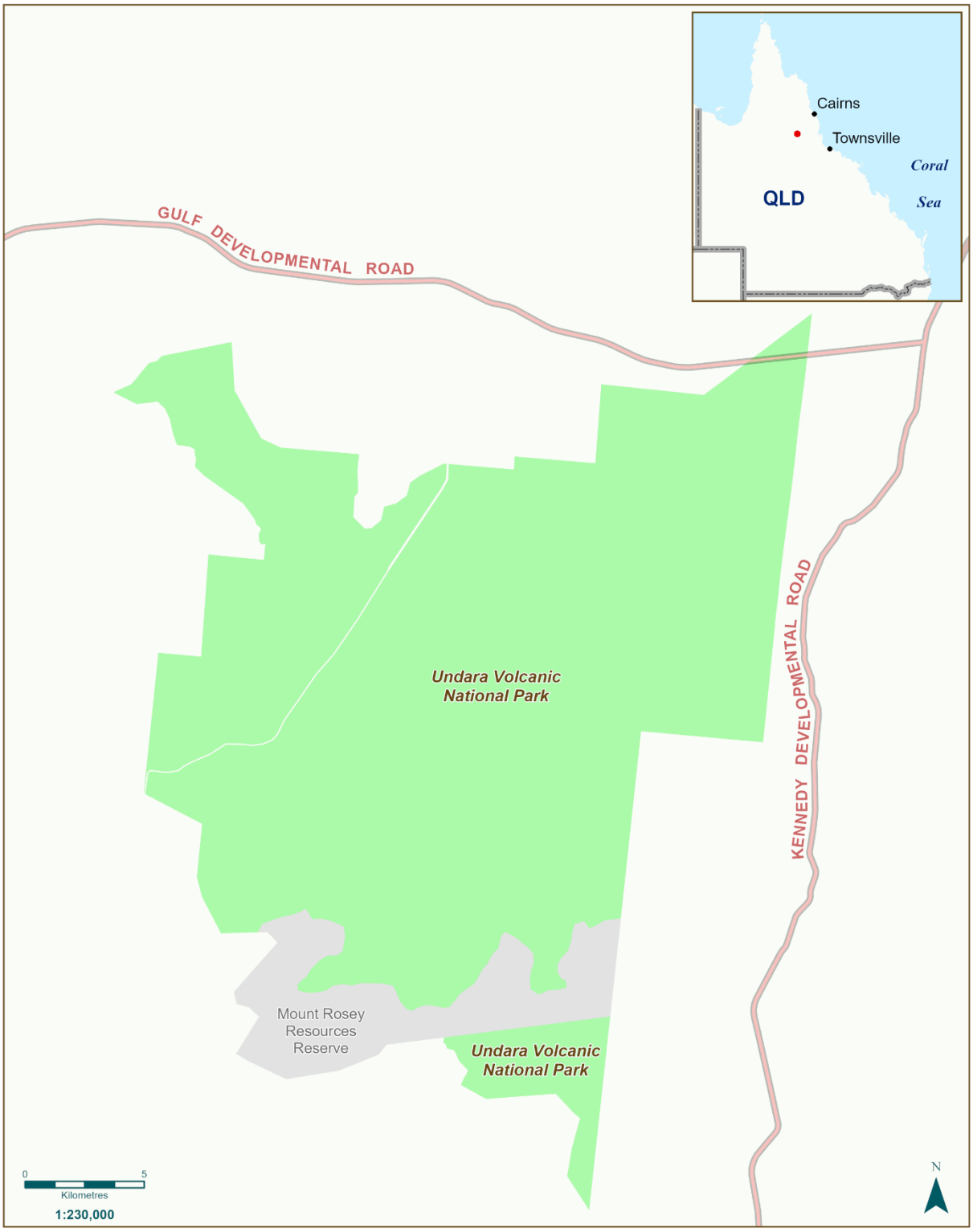

Figure 2. Undara Volcanic National Park location map

2.1 First Nations peoples

2.1.1 Ewamian People

Undara Volcanic National Park lies within part of the lands of the Ewamian (pronounced *You-a-min)* People, who have an ongoing connection to this Country. The ancestors of present-day Ewamian People were born, lived and hunted in this area before the arrival of Europeans.

Ewamian People play an active role in caring for Country activities across the Ewamian estate through their ranger program at Talaroo Indigenous Protected Area/Nature Refuge, cultural heritage assessments of exploration and mining tenements and other development proponents and land owners, including providing operational support for QPWS Rangers.

The Ewamian People have a non-exclusive native title determination (Tribunal Number QCD2013/007) over a majority of the park (approximately 24,500 hectares lie outside the determination area). Traditional Ewamian lands lie within the upper Gilbert and Einasleigh River catchments within the Etheridge Shire local government area. The area of all the Ewamian claims total over 2.9 million hectares.

The Ewamian People Aboriginal Corporation (EPAC) was established in 2013 and is registered under the *Corporations (Aboriginal and Torres Strait Islander) Act 2006*. The corporation has 171 Indigenous members and is governed by a board of seven Indigenous directors. EPAC is supported by Ewamian Limited, the adminstrative entity of the Ewamian corporate group, which provides a range of services to the Ewamian People, with the vision of enhancing Ewamian People's culture and connection to Country through positive change and promoting partnerships with key stakeholders.

QPWS units work collaboratively with EPAC across the protected area estates that are within Ewamian Country, also including Rungulla National Park and Canyon Resources Reserve, to ensure both cultural and environmental values are conserved.

The priorities and goals set in the *Ewamian Aboriginal Corporation Strategic Plan 2016–2021* include increasing communication and engagement with partners and building capacity. QPWS will seek to assist EPAC in achieving its goals through collaborative management arrangements on protected areas where possible.

2.1.2 Gugu Badhun People

The Gugu Badhun People have a non-exclusive native title determination (QCD2012/002) in the south-east corner of the park, an area of approximately 2.9 square kilometres. This area is inaccessible. Gugu Badhun's Country extends from the eastern side of the Great Dividing Range from Undara Volcanic National Park down to Paluma State Forest. QPWS works with the Gugu Badhun People, through the partnership with Girringun Aboriginal Corporation, to ensure values of protected areas across the Gugu Badhun traditional lands are conserved.

2.2 Ecosystems and biodiversity

2.2.1 Bioregion

Undara Volcanic National Park lies centrally within the Einasleigh Uplands Bioregion. The climate of this bioregion is characterised by hot humid summers, cool dry winters, and hot dry periods triggering storms as the seasons change. Annual rainfall varies year to year, but generally ranges from 400 mm to 1000 mm. Geographically, the northern part of the bioregion receives more rain than the southern. The variability of the seasons, including the accumulation and duration of rainfall, has a significant impact on the ecosystems on the park. After the wet season, significant grass growth occurs, which then cures during the winter. This can result in an increased risk of wildfire activity, while drier wet seasons can result in decreased wildfire occurrences due to decreased fuel loads. Given the park's susceptibility to bushfire, planned burning programs are carried out annually across the park, usually commencing in

April, and are one of the most important tools available to park managers to ensure ecosystem conditions are healthy and biodiversity is conserved.

2.2.2 Regional ecosystems

The park supports and protects a variety of regional ecosystems and a diversity of vegetation communities, including many of conservation significance. Sixteen different regional ecosystems are contained within the park and vary in accordance with the geologies of the area. Within the basalt plains, open woodlands are dominated by a mixture of *Eucalyptus* and *Corymbia* species. Among these vastly brown landscapes are pockets of greenery, with semi-evergreen vine thickets popping up on collapsed lava tubes and ponds with little soil development. Low closed forests of black tea-tree *Melaleuca bracteata* can also be found on basalt plains and are associated with the permanent springs in the west of the park, including Fifteen Mile and Twelve Mile springs. Refer to **Appendix 2** for significant regional ecosystems.

2.2.3 Ecosystem services

Undara Volcanic National Park offers a number of ecosystem services, most of which are provided by all national parks across the state. Some important services to note fall into the cultural and provisioning categories of ecosystem services.

The park provisions freshwater services to the broader, predominantly dry landscape. These freshwater sources include the headwaters of the Einasleigh River, which rely on a spring-fed system to offer clean water downstream of the park.

Culturally, there are a number of important services the park offers. Firstly, the park is a part of the Ewamian cultural landscape and provides access to Ewamian People to exercise their native title rights. The park is also managed under the *Nature Conservation Act 1992*, which ensures cultural values are presented and preserved to the greatest possible extent. Secondly, the park provides important social and economic value to the surrounding Mount Surprise communities through access to high-level visitor facilities for nature-based and ecologically sustainable tourism opportunities. Currently, both Undara Experience and Bedrock Village are permitted to operate ecotourism ventures within the park, and provide critical economic value to the community.

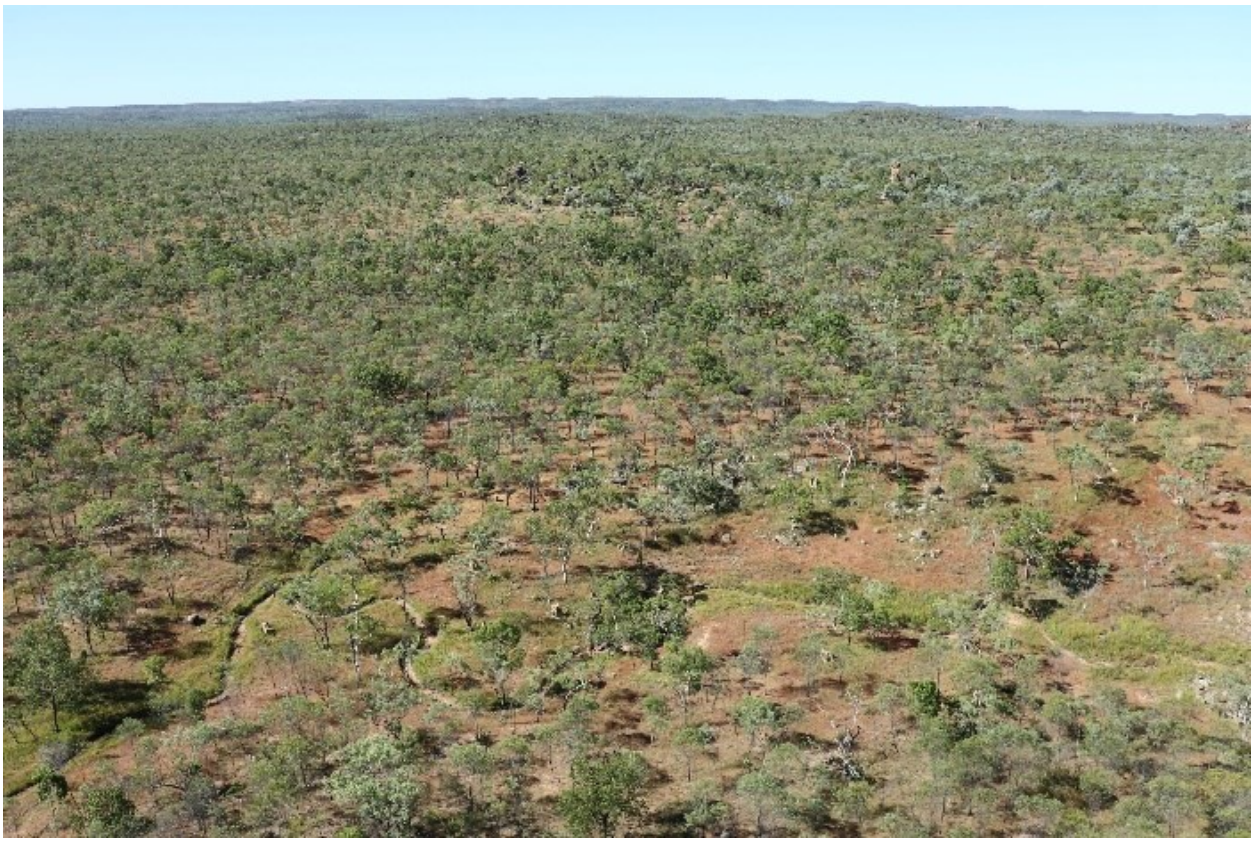

Figure 3. Undara Volcanic National Park © DES, Queensland Government

2.3 Species

2.3.1 Native animals

The most significant mammals that the park's specialised habitats support are bats. Barkers Cave is a major nursery site for the eastern bent-wing bat *Miniopterus orianae oceanensis*, and home to other species such as the eastern cave bat *Vespadelus troughtoni* and the eastern horseshoe bat *Rhinolophus megaphyllus*. It is estimated the colony comprises about 40,000 bats during a maternity period, but this can increase up to 80,000 individuals during peak roosting seasons. The complete list of species of bats found on Undara Volcanic National Park also includes Troughton's sheathtail bat *Taphozous troughtoni*, little bent-wing bat *Miniopterus australis*, eastern dusky leaf-nosed bat *Hipposideros ater aruensis*, diadem leaf-nosed bat *Hipposideros diadema reginae* and ghost bat *Macroderma gigas*. Most of these species of bats are under siege by a number of threatening processes across eastern Australia, including disturbance to roosting sites from recreational caving and tourism, modification of foraging habitat, pesticide use, destruction of caves and predation by feral cats. Undara Volcanic National Park therefore plays a vital role in the protection of bat habitat and conservation of sustainable populations.

Undara is also an important area for macropod species, with the park being home to approximately 10 different species, including antilopine wallaroo *Macropus antilopinus*, black-striped wallaby *Macropus dorsalis*, eastern grey kangaroo *Macropus giganteus*, Mareeba rock wallaby *Petrogale mareeba* and rufous bettong *Aepyprymnus rufescens*. The diversity of macropod species at Undara is likely attributed to the diversity of grass species, availability of water in a predominantly dry landscape, and availability of refugia areas in the semi-evergreen vine thickets.

Birdlife is abundant across the park, with the mixture of open woodlands, closed canopy vine thickets and low *Melaleuca* forests among wetlands offering important nesting and foraging habitat. The variety of bird species across the park includes granivores, frugivores, hollow-dependent species and raptors.

The park is home to many different species of reptiles, which act as important predators and prey for other species on the park. Important to note are the rare or threatened reptiles – the common death adder *Acanthophis antarcticus*, limbless fine-lined slider *Lerista ameles* and Chillagoe litter-skink *Lygisaurus rococo*.

The lava tube systems of Undara offer unique habitat for the subsistence of a variety of species. Some of the more unique types of arthropods that occur on the park include troglobitic millipedes, troglobitic scutigeromorph centipedes and *Pirates,* a troglobitic predatory bug. A number of these species have been researched in the Bayliss Cave as it is one of the only accessible caves with a true deep zone. In Bayliss Cave to date, there have been 24 species of specialised troglobitic cave animals (Stone, 2010).

2.3.2 Native plants

The 'island-like' vine thickets that make up parts of the park landscape are home to a number of unique plant species. These include the small-leaved myrtaceous shrub *Backhousia* sp., which is yet to be fully described, and the rare, white-flowered onion vine *Ipomoea saintronanensis*. The vine thickets of this entire region are near the driest extent of their range, and are likely remnants of communities that once blanketed the landscape in previous climates.

Other plants to note that occur on the park are the endangered *Solanum angustum*, a perennial shrub that is restricted to the Einasleigh Uplands Bioregion and is known to occupy an area less than 5 hectares in total across Queensland. The park also has recordings of a grass species from the *Lepturus* genus, *Lepturus minutus.* Other species of this genus are usually found in coastal locations, but this vulnerable outlier has been modelled as occurring west of the Great Dividing Range in north Queensland.

2.4 Geophysical features

2.4.1 Lava tube system

The Undara lava tube system is located within the McBride Basalt Province and forms a 1550 square kilometre lavafield dated at 190,000 years old. The system is made up of flows that formed caves, arches, depressions, craters, cones and ridges.

One of the flows has been identified as the longest single-volcano flow in the world at 160 kilometres long. It is hypothesised that the lava tube system formed from eruptions of highly fluid basaltic lava, and the preservation of the features we see today is attributed to this mode of formation (Atkinson, 1990). The eruption is likely to have lasted less than three weeks according to researchers (Walker, pers. comm., 1974).

Many of the accessible lava tube floors are now covered by sediment from surface streams, but studies have determined the widest cave is >21 metres and the highest >14 metres. There are five different sections of the lava tube system – Undara Crater; Crater section, North section, Yaramulla section and Wall section.

The Undara Crater, once the centre of all the Undara volcanic action, is a circular structure that forms the highest point of the McBride Basalt Province at 1020 metres above sea level (Whitehead, 2010).

Important to note is also Kalkani Volcano, which erupted prior to the Undara Volcano between 190,000 and 400,000 years ago. Today we see a scoria cone known as Kalkani Crater just north of the Yaramulla Section.

The Undara lava tube system is also unique in the fact it developed on a granitic basement. The Yaramulla section of the flow has developed the largest passages as a result of being confined between outlying granite hills.

2.4.2 Granite outcrops

The rocky granite outcrops that occur partially across the northern section of the park are associated with the Kennedy Province, and are early Carboniferous to early Permian igneous rocks. The outcrops offer unique opportunities to look out across the landscape at locations such as Sunset Bluff.

Figure 4. Undara Volcanic National Park © DES, Queensland Government

2.5 Recreational opportunities

2.5.1 Walking

There are a number of walking trails available to visitors for recreation on the park and in surrounding areas. These include the Kalkani Crater rim walk (grade 3), Atkinson's lookout trail (grade 3) and Rosella Plains lookout trail (grade 4).

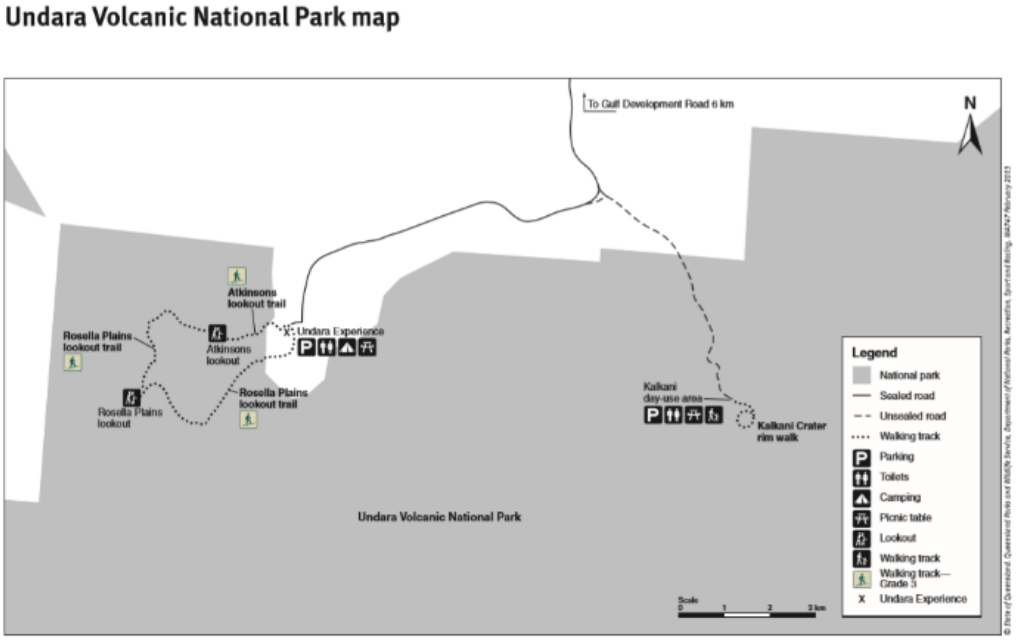

Figure 5. Undara National Park visitor facilities map

2.5.2 Day-use areas

Kalkani Crater is currently the only site available to free and independent travellers for day-use opportunities in the park.

2.5.3 Guided tours

Guided tours are the only way the public can access the lava tubes. There are currently two commercial tour operators that take tours through the presentation caves. For more details on the guided tours, refer to the 'Ecotourism' section.

2.5.4 Viewing wildlife

Visitors to Undara Volcanic National Park can be provided with a number of opportunities to view the unique and exciting wildlife that occurs on the park, particularly around the presentation caves.

Barkers Cave provides the exciting experience of viewing brown tree snake species prey upon unsuspecting eastern bent-wing bats species as they emerge from the cave during roosting season.

For visitors less enthused by bat-eating snakes, the park also offers vast open woodlands that are perfect for viewing a number of macropod species grazing and birds foraging.

2.6 Ecotourism

2.6.1 Tourism and visitor opportunities

The two commercial operators that maintain activities on the park are Undara Experience and Bedrock Village. Both operate nature-based ecologically sustainable tourism ventures at the presentation caves and Kalkani Crater in the way of guided tours.

Commercially guided tours of lava tube sections began in 1989 and now attract approximately 30,000 domestic and international visitors per year. Unguided access is not permitted to the lava tubes, and therefore, ecotourism plays a critical part in delivering the visitor experience of the park's values to the public. Commercial tour operators access the park through formal agreements and were sourced originally through a publicly advertised expression of interest process. This process ensured the fulfilment of a number of criteria specifically tailored to this precious area. For example, guides must be accredited to provide a high level of knowledge and safety programs.

Safety risks for unguided visitors include the possible inhalation of air high in carbon dioxide, disorientation, rock falls and fall hazards in undeveloped cave sections.

Tour operation sizes are restricted to protect the caves, their inhabitants, the visitors and visitor experience. A maximum tour size of 25 people is specified in the agreements for existing operators, and under the current program, only one group is on a site at any one time. These restrictions raise the level of visitor experience in this vast open area.

The current commercial visitation levels appear to be highly effective in maintaining the cave experience and sustainable visitor capacity. QPWS monitors both environmental and social conditions over the term of the agreements to determine the effectiveness of current visitor levels.

QPWS ensures all ecotourism operations are compatible with the purposes of management in the park and continue to provide important social value to the broader community.

2.7 Historic cultural heritage

2.7.1 The electric telegraph

The electric telegraph line that tracked through the park was part of the section of the Cardwell to Junction Creek line that operated in the 1870s. This line was an important connection for the overland telegraph, which extended from Cardwell to the Gulf of Carpentaria. The line was first mapped in 1866 by Frederick Walker, a bushman and explorer. Construction of the line commenced in 1870 and took two years to build to Normanton, including the establishment of five repeater stations along the way. As was common back then, many hard workers who set off to build the line were not fortunate enough to return, with many coming down with 'fever' and dying on the track over the two-year construction. Unfortunately, many of these deaths were in vain, as the Cardwell to Junction Creek section of the line was disconnected and abandoned in 1881 as more cost-efficient routes were adopted.

2.7.2 Pastoralist history

Prior to the park's gazettal in 1989, the property was used for cattle grazing by the Collins family from 1862. The Collins family was the driving force behind the gazettal of the park for the protection of the caves.

2.8 Scientific research

Scientific research on national parks plays an important role in informing park management decisions. The majority of the scientific research that has come out of the park is in relation to Cainozoic

volcanism, cave biology and vine thickets. The *Undara Volcanic National Park Monitoring and Research Strategy* has set the direction for scientific research and future projects that are desired by park managers to assist in the future management of the park to protect key values.

2.9 Fire

2.9.1 Climate

Weather characteristics directly related to the climate of an area have a dramatic impact on the behaviour of fire, so understanding the pattern of weather conditions over time is essential when planning how to manage fire. Predicted climate change impacts may influence the fire management approach within some areas. The weather at Undara Volcanic National Park is hot and humid, and can be very wet from late October through to late March. Although the park on average only receives 700 mm of rain per year, this annual rain triggers the onset of new growth, green grass and running creeks, after which the landscape rapidly changes back to its usual brown and dry environment. September and early October are generally dry and hot. The drier, cooler months are between April and August. From the end of the wet season to the early dry season, strategic burns are carried out, both on ground and aerially, to create a mosaic pattern with the aim to limit the potential for late season hot fires, which have the potential to destroy fire sensitive vegetation that occurs in unique pockets across the vast open savannah landscape.

2.9.2 Fire history

The park historically has experienced a number of unplanned fire events, with most of these fires suspected of being arson. The unplanned fires have generally occurred in the late dry season, with some fires completely burning the park and spreading beyond the boundaries.

Due to this history of large bushfires across the park, a comprehensive burn program is now in place, with annual strategic early season mitigation burns applied followed by progressive ecological burns throughout the year. The program has been applied successfully for a number of years and can be evaluated by the substantial reduction in unplanned fire events with the creation of mosaic patch burning throughout. The program has also promoted the health of those vegetation communities, represented by maintaining the open grassy woodland structure and species composition, which is characteristic of these communities within this area of the Einasleigh Uplands Bioregion. The *Undara Volcanic National Park Fire Strategy* sets the direction for fire management for park managers to assist in the management of the park to protect key values.

2.10 Pests

The vegetation communities of Undara Volcanic National Park are prone to invasion by weeds, including rubber vine *Cryptostegia grandiflora* and lantana *Lantana camara*. These weeds are most likely to contribute further to vine thicket attrition when combined with late dry season fires. The increased risk of fire encroachment can be a direct result of disturbance, high biomass grass and lantana invasion.

Introduced animals, including feral pig *Sus scrofa,* stray horses *Equus ferus* and stray cattle *Bos taurus*, negatively impact the key values of the park through digging, rooting and trampling.

The *Undara Volcanic National Park Pest Strategy* sets the direction for pest management for park managers to assist in the management of the park to protect key values.

Refer to **Appendix 5**. Pests.

Appendices

Appendix 1. Legal, policy and management commitments

Gazettal details

Undara Volcanic National Park was gazetted in 1989.

Applicable Acts and statutory powers

- *Aboriginal Cultural Heritage Act 2003* (Qld)
- *Biosecurity Act 2014* (Qld)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
- *Native Title Act 1993* (Cwlth)
- *Nature Conservation Act 1992* (Qld)
- *Native Title Act 1993* (Cwlth)
- *Queensland Heritage Act* 1992 (Qld)
- *Recreation Areas Management Act 1992* (Qld)
- *Stock Route Management Act 2002*
- *Stock Movement Regulation 2005*

Management obligations

- CMS – Conservation of Migratory Species of Wild Animals
- CAMBA – China–Australia Migratory Bird Agreement
- JAMBA – Japan–Australia Migratory Bird Agreement
- ROKAMBA – Republic of Korea–Australia Migratory Bird Agreement

Recovery plans and guides

- National recovery plan for cave-dwelling bats, *Rhinolophus phillipinensis, Hipposideros semoni* and *Taphozous troughtoni*

Appendix 2. Regional ecosystems of significance

Regional ecosystem	Description	Biodiversity status
9.3.3	*Corymbia* spp. and *Eucalyptus* spp. dominated mixed woodland on alluvial flats, levees and plains	Of concern
9.3.11	Wetlands (sometimes ephemeral), fringed by grasses and sedges or with a fringing woodland which can contain *Eucalyptus camaldulensis* (river red gum) or *E. tereticornis* (blue gum) or *Melaleuca fluviatilis* (teatree). Occurs in pockets surrounded by rocky basalt walls, run-on areas and areas of alluvial deposition on basalt geologies. (BVG1M: 34d) Vegetation communities in this regional ecosystem include: **9.3.11a:** Wetlands (sometimes ephemeral), often with a fringing woodland which can contain *Eucalyptus camaldulensis* (river red gum) or *E. tereticornis* (blue gum) +/- *Eucalyptus platyphylla* (poplar gum) +/- *E. leptophleba* (Molloy red box). The fringing vegetation can also include a sub-canopy layer which can contain *Melaleuca* spp. (teatrees) Alternatively the fringing woodland species can occur as emergents +/- *Casuarina* spp. (sheoaks). Ground layer species present include *Marsilea hirsuta* (short-fruited nardoo), *Schoenoplectus* spp. (clubrush) and *Eleocharis* spp. (spike-rushes) This unit may have areas of grassland included. Occurs on run-on areas and areas of alluvial deposition on basalt geologies. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34d) **9.3.11b:** Permanent or ephemeral wetlands on dark basaltic clay with or without loose basalt rocks, surrounded by Quaternary basalt. This unit includes a mosaic of open areas and low rocky rises with *Eucalyptus camaldulensis*. Water bodies are fringed by *Sesbania cannabina* var. *cannabina*, grasses such as *Paspalidium udum*, and/or sedges such as *Cyperus exaltatus*, often with a zone of trees behind. Trees include *Eucalyptus camaldulensis* (river red gum) and/or *Melaleuca fluviatilis* (teatree). Open grassland areas include *Eriochloa* sp., *Cyperus* sp. and various other spp. Closed depressions in the great basalt wall surrounded by Quaternary basalt. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34d)	Of concern
9.8.7	Semi-evergreen vine thicket with many codominant species, many vines and without clearly defined layers. Includes *Gyrocarpus americanus* (helicopter tree), *Brachychiton australis* (bottle tree), *Pleiogynium timorense* (Burdekin plum), *Bridelia leichhardtii*, *Psydrax odorata*, *Cupaniopsis anacardioides*, *Diospyros humilis* and *Homalium brachybotrys*. Can occur as a closed forest with *Alstonia scholaris* (milky pine), *Terminalia sericocarpa* (damsonwood), *Nauclea orientalis* (Leichhardt tree), *Ficus racemosa* (cluster fig) and *F. virens* (strangler fig) on creeks and around springs or as an open woodland of *Corymbia tessellaris* (Moreton Bay ash) and/or *Eucalyptus tereticornis* (blue gum) with an open mid layer of vine thicket species. Occurs on lava flows, cones and craters and rocky substrates with no soil development on Quaternary and Tertiary basalts. (BVG1M: 7a) Vegetation communities in this regional ecosystem include: **9.8.7a**: Softwood scrubs on rocky basalt substrates. Occurs on lava flows, cones and craters and rocky substrates with no soil development on Quaternary and Tertiary basalts. (BVG1M: 7a) **9.8.7b**: Softwood scrubs on rocky basalt substrates with wetlands. Occurs on lava flows, cones and craters and rocky substrates with no soil development on Quaternary and Tertiary basalts. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 7a)	Of concern

Appendix 3. Species of conservation significance

Scientific name	Common name	NC Act status	EPBC Act status	Back on track
Plants				
Solanum angustum	-	Endangered	-	-
Ipomoea saintronanensis	white-flowered onion vine	Vulnerable	-	-
Lepturus minutus	-	Vulnerable	-	-
Animals				
Hirundapus caudacutus	white-throated needletail	Special least concern	-	-
Tringa glareola	wood sandpiper	Special least concern	-	-
Petauroides volans minor	northern greater glider	Vulnerable	Vulnerable	-
Petauroides Volans	greater glider	Vulnerable	Vulnerable	-
Hipposideros diadema reginae	diadem leaf-nosed bat	Near threatened	-	-
Dasyurus hallucatus	northern quoll	Least concern	Endangered	-
Macroderma gigas	ghost bat	Endangered	Vulnerable	-
Phascolarctos cinereus	koala	Vulnerable	Endangered	-
Tachyglossus aculeatus	short-beaked echidna	Special least concern	-	-
Lygisaurus rococo	Chillagoe litter-skink	Near threatened	-	-
Acanthophis antarcticus	common death adder	Vulnerable	-	-
Lerista ameles	limbless fine-lined slider	Vulnerable	-	-

Appendix 4. Species listed in international agreements

Scientific name	Common name	CMS	JAMBA	ROKAMBA	CAMBA
Hirundapus caudacutus	white-throated needletail		✓	✓	✓
Tringa glareola	wood sandpiper	✓	✓	✓	✓

Notes:

This list includes local and migratory birds that regularly use the park for feeding, nesting and/or breeding. Species that visit from time to time but are not regular users have not been included in the table.

CMS – Convention on the Conservation of Migratory Species of Wild Animals

CAMBA – China–Australia Migratory Bird Agreement

JAMBA – Japan–Australia Migratory Bird Agreement

ROKAMBA – Republic of Korea–Australia Migratory Bird Agreement

Appendix 5. Pests

Scientific name	Common name	*Biosecurity Act 2014* status
Plants		
Cryptostegia grandiflora	rubber vine	Restricted invasive
Themeda quadrivalis	grader grass	-
Cenchrus ciliaris	buffel grass	-
Parthenium hysterophorus	parthenium weed	Restricted invasive
Solanum seaforthianum	Brazilian nightshade	-
Cenchrus echinatus	Mossman river grass	-
Calotropis procera	calotrope	-
Solanum mauritianum	tobacco bush	-
Lantana camara	lantana	Restricted invasive
Macrotyloma axillare	perennial horse gram	-
Hyptis suaveolens	hyptis	-
Passiflora suberosa	passionfruit vine	-
Animals		
Sus scrofa	pig	Restricted invasive
Bos taurus	cattle	-
Rhinella marina	cane toad	Invasive
Equus caballus	horse	-
Felis catus	cat	Restricted invasive

References

Atkinson, A. (1990) ‘The Undara Lava Tube system and its caves’, *Journal of Australasian Cave Research*. Helictite, 28(1), pp. 3–14.

Ewamian People Aboriginal Corporation (2017) *Ewamian Aboriginal Corporation Strategic Plan*. Available at: https://www.ewamian.com.au/.

Queensland Government (2000) ‘Undara Volcanic and Forty Mile Scrub National Parks Management Plan’. Queensland Government, pp. 1–32.

Stone, F. D. (2010) ‘Bayliss Lava Tube and the discovery of a rich cave fauna in tropical Australia’, *Proceedings 14th International Symposium on Vulcanology*, pp. 47–58.

Whitehead, P. (2010) ‘The regional context of the McBride Basalt Province and the formation of the Undara Lava flows, tubes, rises and depressions’, in *Proceedings of the 14th International Symposium on Vulcanospeleology*, pp. 9–18. Available at: https://researchonline.jcu.edu.au/15196/.