PART TWO

BLACK HILL RESERVE ENVIRONMENTAL MANAGEMENT PLAN: ACTIONS AND IMPLEMENTATION PROGRAM

1. INTRODUCTION

This is Part 2 of the *Black Hill Reserve Environmental Management Plan*. Part 2 sets out the management principles and actions proposed for each management zone.

The recommendations presented in the *EMP: Part 1* forms the basis of the management principles and actions that have been developed for each Management Zones within this accompanying Part 2 document.

1.1 EMP Objectives

The objectives of the Black Hill Environmental Management Plan (as outlined in the Project Brief; November 2014) are:

- To identify the environmental values of the reserve
- To establish a prioritised program of management actions aimed at conserving and enhancing the site's environmental values while managing environmental risks and maintaining the reserve's leisure and recreation functions
- To establish a monitoring and evaluation program for the site's environmental assets and management.

2. BLACK HILL MANAGEMENT OBJECTIVES AND PRINCIPLES

To conserve and improve upon the ecological values identified at Black Hill Reserve, and to continue to provide the range of fauna habitat and passive recreational opportunities that exist within the reserve, the vision and the overall management objectives for the reserve are focused upon maintaining and enriching the reserve ecological values, whilst also providing passive recreational opportunities, as outlined below:

2.1 Vision

Black Hill Reserve is highly valued by the local community for its ecological, cultural and passive recreation values which benefit the community's health and wellbeing.

The reserve's remnant bushland and revegetation areas provide a refuge in the landscape for native flora and wildlife, including various endangered and threatened species.

Through careful management and conservation, the reserve will continue to provide an opportunity for all members of the community to understand, appreciate and engage with local flora and fauna as well as the area's cultural heritage.

Into the future, Black Hill Reserve will continue to fulfil an important ecological, educational, passive recreation and nature tourism role, enriching the lives of the local community and visitors.

2.2 Management Objectives

The objectives of undertaking ecological management at Black Hill Reserve are:

- To maintain and increase the remaining indigenous bushland values identified in the reserve
- To maintain and increase the habitat values identified, in both the remnant bushland and revegetated areas of the reserve
- To manage bushfire recovery, to enhance the vegetation communities (EVCs) that would have occurred in the reserve prior to the previous planting and erosion stabilisation works; in the areas with higher quality indigenous ground storey vegetation only
- To ensure the regeneration of planted native trees/shrubs is restricted to the areas of the reserve with lower indigenous ground storey vegetation cover, and to limit the impacts of regenerating planted native trees/shrubs on areas identified with a high cover (greater than 50%) of indigenous ground storey vegetation
- To ensure the passive recreational values of the reserve are maintained, whilst also maintaining and enhancing the ecological/biodiversity values of the reserve.

3. BLACK HILL MANAGEMENT ZONES

Section 3.2 of Part 2 of the Black Hill Reserve EMP discusses the management issues that have been identified at Black Hill. Recommendations regarding each of these management issues are also provided, which have then been utilised to define management principles across the different areas of the reserve.

To provide a framework for the effective implementation of the management principles, Management Zones have been designated across the reserve based on areas with similar uses and purposes.

Overall five Management Zones have been identified which are described below.

3.1 Higher Quality Bushland Zone (HQBZs)

The higher quality Bushland Zones have been determined based upon the indigenous ground storey vegetation cover mapping method outlined in Sections 2.4.3 and 3.3.

Areas with greater than 50% indigenous ground storey vegetation cover (blue category) are considered to represent the higher quality bushland within the reserve, as these areas still contain remnant ground storey vegetation, and remnant shrubs and trees, indicating they have been less disturbed than other areas of the reserve.

Overall five main areas with higher quality bushland were identified in the reserve, with an additional two smaller areas identified in 2016 as Zone 6:

Zone 1

Around the main entrance along the western perimeter of the reserve

- This area contains a diversity of indigenous grasses and herbaceous species
- This area was not burnt during the 2015 bushfire
- There are some planted native trees/shrubs, mostly closer to the walking track
- This area extends to the northern side of the Circuit Track.

Zone 2

In the recent revegetation are in the north-east of the reserve, the indigenous ground storey vegetation cover is high, but not very diverse, as the vegetation mostly consist of Wallaby Grass and Weeping Grass, with some indigenous herbaceous species. This area was not burnt in the 2015 bushfire

Zone 3

The main wildflower patch in the south-west of the reserve

- According to the Friends group this area contains many of the wildflowers, lilies and orchids that grow within the reserve, in spring and early summer
- The area was burnt in the 2015 bushfire

- There appears to be a less dense shrub cover in this area

Zone 4

Along the ridge and around the granite outcrops (burnt area)

- A high cover of indigenous ground storey vegetation was mapped along most of the length of the Ridge Track
- It appeared to correlate with areas that were not quarried for gravel, possibly due to the presence of large granite boulders
- This area extended down amongst the granite boulders to the north of the Ridge Track, and to a lesser extent to the south of the Ridge Track
- This is the largest area with a high cover of indigenous ground storey species within the reserve
- All of this area was burnt in the 2015 bushfire

Zone 5

A small area of Kangaroo Grass at the northern end of the reserve (burnt area)

- Whilst only a very small area, this area contains the only patch of Kangaroo Grass *Themeda triandra* recorded within the reserve
- This area provides an example of what the ground storey vegetation cover would have been at the northern end of the reserve, in the area containing EVC 175_62: *Granitic* Grassy Woodland prior to the impacts from the previous timber and gravel extraction activities

Zone 6

Two small areas added following the 2016 re-mapping of some ground storey vegetation within the Reserve.

Both areas are adjacent to the Circuit Track; with a higher cover of indigenous herbaceous species than the surrounding weedy areas.

3.2 Lower Quality Bushland Zones (LQBZs)

This zone is represented in the areas coloured with orange or red in the indigenous ground storey map (refer to Map 9). These areas contain less than 50% indigenous ground storey vegetation cover, and are dominated by exotic grasses/herbaceous species.

These areas were impacted by the gravel quarrying to a larger extent than the areas with greater than 50% indigenous ground storey vegetation cover.

These areas are predominantly located on the slopes of Black Hill, in the valleys between the granite outcrops, and on the lower slopes around the perimeter of the reserve.

3.3 Track Management Zones (TMZs)

This Zone applies to the tracks that have been constructed within the reserve:

- Circuit Track
- Ridge Track
- Revegetated Area Track

Management is required to maintain the track surfaces, steps and access to the main features of the reserve; the Eastern and Northern Lookouts and The Monolith. Management works are also required in the next 5-10 years to remove regenerating trees/shrubs from the tracks in the burnt areas, and for limb safety management over the tracks, in the longer term.

The Friends Group has placed chopped/fallen branches alongside some sections of track, especially along the Revegetated Area Track, which is useful in defining the track route. These branches require some maintenance/replacement on an irregular basis.

In conjunction, regeneration from the bushfire is causing dense stands of tree/shrub to regenerate alongside and within some sections of the tracks. Maintenance will be required for the next 5-10 years, until the vegetation stabilises, to remove this vegetation growing on the track and along either side of the track.

3.4 Dam Zones (DZs)

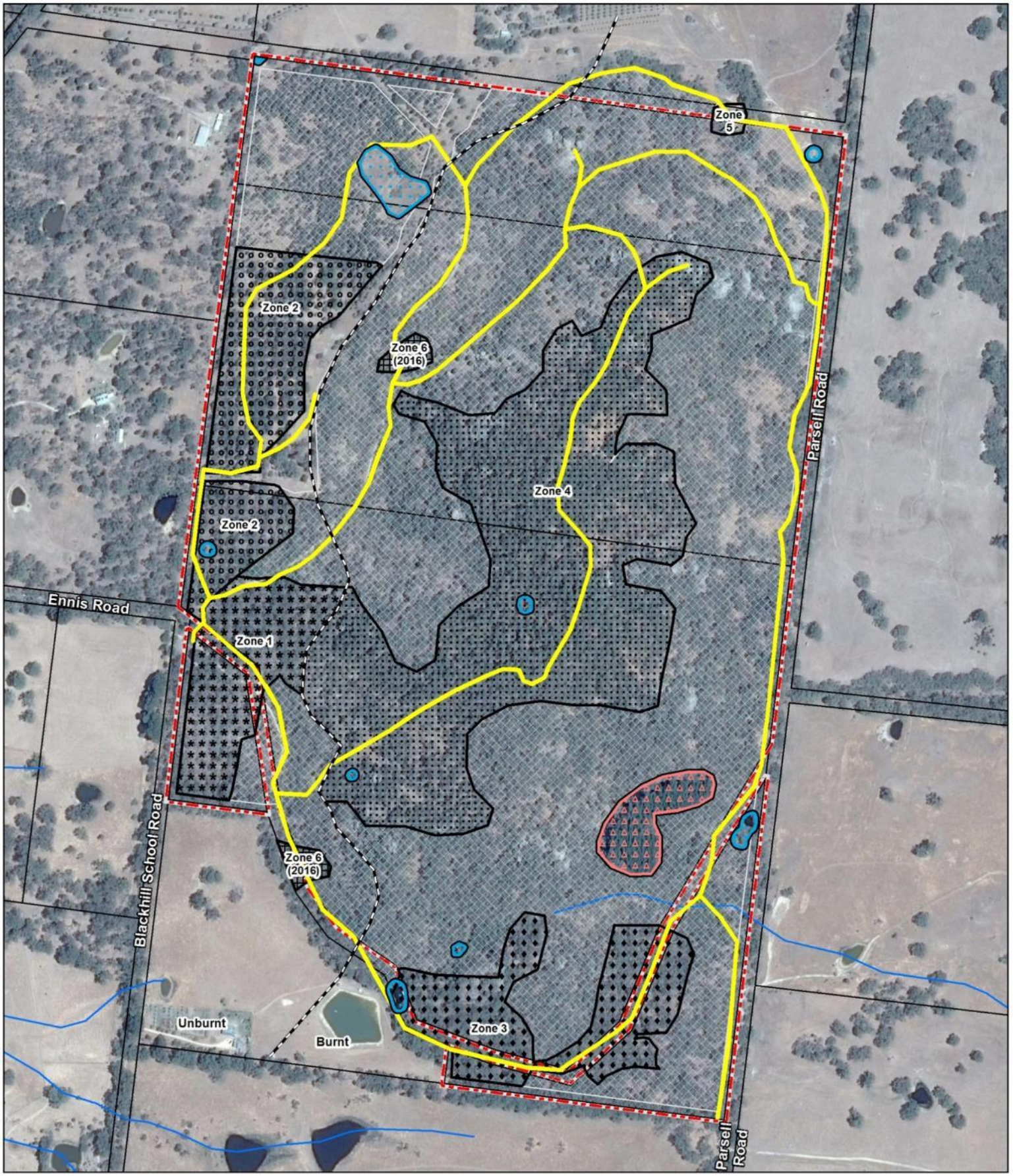
There are several dams within the Reserve, most of which have a combination of fauna habitat and water storage functions.

Three of the dams contain permanent water, whilst the remainder are ephemeral, filling during wet seasons or heavy rainfall events. The ephemeral 'dams' are mostly artificial depressions created as a result of the former quarrying activities.

3.5 Pine Plantation Zone (PPZ)

The pine plantation has been defined as a Management Zone as it is the largest area of exotic vegetation within the reserve, and it will need to be managed in the near-future as the burnt mature pines gradually fall over creating an 'empty' space within the reserve.

Refer to Map 9 (following page) for the location of the management zones at Black Hill Reserve.



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Disclaimer
Practical Ecology bears no responsibility for the accuracy and completeness of this information and any decisions or actions taken on the basis of the map. While information appears accurate at publication, nature and circumstances are constantly changing.

Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Management Zones

- Dam Zone
- Track Management Zone
- Pine Plantation
- Lower Quality Bushland Zone

Higher Quality Bushland Zone

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6 (2016)

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 23/11/2016

Map 9. Management Zones
Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)

3.6 Management Principles across the Reserve

To achieve the vision and overall management objectives for the reserve, a set of management principles have been defined that apply to all or some of the five management zones identified previously. These management principles are outlined in Table 12 below. If the management principle as stated applies, it is denoted with an 'X' under the applicable management zone. Where additional information applies, this is also outlined under the applicable management zone. If the principle does not apply, this is denoted with an 'N/a' under the applicable management zone. Aside from the Pine Plantation Zone, there are no additional specific management principles for the other management zones within the reserve.

Table 12. Management Principles for Black Hill Reserve

MANAGEMENT PRINCIPLES	MANAGEMENT ZONES								
	Higher Quality Bushland Zones					Lower Qual Bushland Zone	Tracks Zone	Dams Zone	Pine Plantation
	1	2	3	4	5				
Protection of vegetation No indigenous trees, shrubs or ground-storey species should be deliberately removed or destroyed	X	X	X	X	X	X	Some vegetation lopping/removal maybe required for fuel management and vehicle access purposes	Includes protection of indigenous wetland vegetation	X
Defining Perimeter of Zone The area is depicted in the Indigenous Ground storey Vegetation Cover map, and should be considered for on-ground delineation with capped star pickets, logs or rocks, to define extent of zone for management purposes. Include a buffer area surrounding zone for weed or other management purposes as appropriate. Boundaries to be sourced from 50x x 50m mapping grids and/or determined on-ground by qualified bushland management personnel	X	X	X	X	X	N/a	N/a	N/a	N/a

MANAGEMENT PRINCIPLES	MANAGEMENT ZONES								
	Higher Quality Bushland Zones					Lower Qual Bushland Zone	Tracks Zone	Dams Zone	Pine Plantation
	1	2	3	4	5				
Weed control • Focus weed control on quarterly to annual "weed sweeps" in accordance with the weed species list (refer to Table 8), depending on the weed being controlled- woody or grassy/ herbaceous. • Weeds that are sprayed with herbicide should be left in-situ to break down • Trees/shrubs recruiting/regenerating from planted native stock should be removed • Mature planted native trees/shrubs should remain in-situ. • Avoid brush cutting woody weeds with seed present.	X	X	X	Some regenerating trees/shrubs from planted native species may need to be retained if erosion of the slopes is an issue	Hand pull non-indigenous herbaceous species and introduced grasses.	Do not remove trees/shrubs that are regenerating from planted native species	X	Use frog friendly herbicides only	Focus weed control on CALP Act species
Planting/Revegetation • No planting should occur in areas for at least five years until data has been gathered concerning regeneration across the reserve following the 2015 bushfire • In future, if required, any planting should be based on the relevant EVC Revegetation Template	X	X	X	X	X	X	N/a	X	Future revegetation maybe required if pines are removed and area is rehabilitated/ revegetated

MANAGEMENT PRINCIPLES	MANAGEMENT ZONES								
	Higher Quality Bushland Zones					Lower Qual Bushland Zone	Tracks Zone	Dams Zone	Pine Plantation
	1	2	3	4	5				
Monitoring • Install 1 or 2 monitoring plots in the area to gather data on the relevant EVC in an unburnt/burnt area of the reserve; or utilise pre-existing Council plots • Undertake monitoring on an annual basis • Install capped start picket to define one corner, so the data gathered in the plot is replicable	X	X	X	X	X	X	N/a	N/a	N/a
Management of Buffer surrounding Zone • Create a 5-10m buffer surrounding the zone • All ground storey weeds should be brush cut/slashed prior to seed set, to reduce seeds entering adjacent higher quality bushland zones • Scattered indigenous ground storey plants should be avoided	X	Zone is heavily grazed, so not currently required	X	X	X	N/a	N/a	N/a	N/a
Vegetation Removal • No trees/tree limbs should be lopped, except along the walking tracks (in the Track Management Zones) • No indigenous vegetation should be removed from the zone	X	X	X	X	X	X	Some vegetation lopping/removal maybe required for fuel management and vehicle access purposes	X	X
Arborist/Council assessments Arborist assessments and/or a planning permits are required for any vegetation proposed for removal along the tracks for safety or fire management purposes	N/a	N/a	N/a	N/a	N/a	N/a	X	N/a	N/a

MANAGEMENT PRINCIPLES	MANAGEMENT ZONES								
	Higher Quality Bushland Zones					Lower Qual Bushland Zone	Tracks Zone	Dams Zone	Pine Plantation
	1	2	3	4	5				
Fauna management and limb removal Undertake fauna inspection procedures outlined in the EMP prior to any limb removal works	N/a	N/a	N/a	N/a	N/a	N/a	X	N/a	X– if removing pines trees
Park Furniture/Shelters/Picnic Tables Do not locate any proposed facilities/park furniture in areas with greater than 25% indigenous ground storey vegetation cover	X	X	X	X	X	X	X Avoid siting park furniture in areas with overhanging limbs	X	N/a
Mulch and stockpiles No mulch or other materials are to be stockpiled in the zone	X	X	X	X	X	X	X	X	X
Management Vehicle access Vehicles should be restricted to Circuit Track only	X	X	X	X	X	X	X	X	X
Erosion Monitoring Undertake erosion monitoring on the slopes If occurring; do not remove regenerating naturalised trees/shrubs, and further planting may be required	N/a	N/a	N/a	X	N/a	X	N/a	N/a	N/a
Fauna Monitoring Use remote cameras to monitor native fauna and pest animal use of dams	N/a	N/a	N/a	N/a	N/a	N/a	N/a	X	N/a

3.6.1 Specific Management Principles- Pine Plantation

The Pine Plantation is an area of the reserve that contains a stand of planted exotic vegetation that was semi-burnt and is now mostly dying following the 2015 bushfire. It therefore requires specific management principles that apply to the short and long term management of the area, depending on how Council decides to manage the area.

The general management principles that also apply to the Pine Plantation are presented in Table 13 below.

Table 13. Management Principles for Black Hill Reserve- Pine Plantation

Objectives
• To reduce potential hazards from falling Radiata Pines • To eventually remove the Radiata Pines from the reserve and allow the former plantation area to regenerate to the surrounding vegetation • To potentially undertake revegetation works with indigenous species if the plantation area does not adequately regenerate from soil seed stock • To eliminate naturalised species from the plantation area, and to regenerate an area of the reserve based on the EVC benchmark and indigenous species • To control Radiata Pine wildings across the reserve
Ecological Management Principles
Strategic vegetation management works should occur to control potential hazards from falling Radiata Pines, and to encourage indigenous regeneration across the plantation area **Mature Pine Management- Signage** Install 'No Entry; Falling Tree Hazard' signs around the plantation **Mature Pine Management- Felling the Pines** Allow the Radiata Pine to fall naturally over the next 2-10 years, unless funding becomes available for their removal. **Management of Logs** Once down, the fallen Pines will need to be removed or there will be a dense area of fallen trees that will take decades to rot. This will create harbour for pest animals and will prevent regeneration of the area into bushland. It may be appropriate to mulch the logs, or just remove them from the reserve. **Planting / revegetation** • If / once the pine plantation is removed, any planting should be based on the relevant EVC Revegetation Template, using indigenous species only

4. MANAGEMENT ACTION AND IMPLEMENTATION PLAN

All of the recommendations associated with the ecological management issues identified at Black Hill are presented in Table 13 on the next page, in association with the management objectives for the reserve. The actions in the table are ordered by management theme.

Status

Each management recommendation is listed along with the management priority, to be undertaken by whom and the resources required. An outline of the priority is provided below:

- **Current and On-going Actions**
  - Works guidelines that don't require any specific funding.
- **New High Priority Actions- Separate Funding (1 to 3 years)**
  - Priority management actions that need to be resourced specifically. These actions will be staged over the next 1 to 3 years.
- **New Medium Priority Actions- Separate Funding (3 to 10 years)**
  - Priority management actions that need to be resourced specifically. These actions will either be staged over the next 3 to 10 years).
- **New Aspirational Actions**
  - These actions have not been prioritized. They will occur if the opportunity arises.

The timing of all actions will be subject to staff and budget resource availability.

Resources required

With regard to the resources required, the following categories have been applied:

- Internal staff resources
- None required
- $: $1-5K
- $$: $5-10K
- $$$: $10-20K
- $$$$: $20K+

Many of the actions listed will be implemented in collaboration with the Friends group/local community groups as appropriate.

Table 14. Ecological Management Recommendations and Actions

Actions and recommendations are mostly listed in numerical order; with reference to their location if they are 'out of order'.

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
	Management Theme- General Reserve Management (Land Tenure)			
Rec 1	Macedon Ranges Shire Council should apply to become Committee of Management for the Crown Land section of the reserve.	New high priority	Council	-
Rec 2	Investigate whether the site is suitable for a conservation covenant, such as a Trust for Nature Covenant.	New medium priority	Council	-
	Management Theme- Legislation			
Rec 3	Consider rezoning the Farm Zone (FZ) sections of the reserve to Public Conservation and Recreation Zone (PCRZ)	New medium priority	Council	$
	Management Theme- Weed Control			
Rec 4	Implement a strategic weed control program that: - firstly prioritises treatment of CaLP Act, S1 and S2 weeds in the higher quality bushland areas - secondly aims to treat CaLP Act and S1 weeds in the lower quality areas - aims to control exotic grasses and herbaceous species in a 5m to 10m buffer around the higher quality bushland areas prior to them setting seed - utilises the species prioritisation in Tables 8 and 9 to guide other weed control activities - includes follow up weed control and an annual 'weed sweep' to treat any germinating or 'missed' plants	Current and on-going	Council	$ annually
Rec 5	Consider the removal of regenerating planted native trees and shrub species in the higher quality bushland areas of the reserve, based on the monitoring plot data (refer to Sections 11.4 and 11.7)	Aspirational	Council	$$
	Management Theme- Vegetation Management			
Rec 6	Remove any large volumes of cut plant matter if they present a risk to regenerating indigenous ground storey or if the plants have seeded, in the higher quality bushland zones. Leave small volumes in situ.	Current and on-going	Council and Friends Group	$
Rec 7	Retain all planted species in the lower quality bushland zones, as they are stabilising the slopes and other eroded areas	Current and on-going	Council and Friends Group	-

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
	Management Theme- Revegetation			
Rec 8	Postpone any further plantings within the reserve for the next five years (until 2020)	Current and on-going	Council and / or Friends Group	-
Rec 9	Implement the proposed management zones to define areas within the reserve that are no longer appropriate for planting	Current and on-going	Council and / or Friends Group	-
Rec 10	Limit future revegetation to areas with less than 25% remnant indigenous understorey vegetation cover	Current and on-going	Council and / or Friends Group	-
Rec 11	Only use indigenous species appropriate to the EVC in any future revegetation works	Current and on-going	Council and / or Friends Group	-
Rec 12	Develop Revegetation Templates based on EVCs and appropriate planting densities for the EVCs occurring at Black Hill, to account for the site specific conditions, prior to undertaking any future revegetation works	New medium priority	Council	Internal resources
	Management Theme- Indigenous Flora Management			
Rec 13	Prepare a Flora Monitoring Plan that: • includes use of monitoring plots and other techniques to track change within the reserve over time. • enables monitoring of the reserve's recovery following the 2015 bushfire. • includes a threatened species section, including monitoring of Floodplain Fireweed to ascertain if it survives outside its' usual habitat range • monitors for presence of the Late-flower Flax-lily in the previous location adjoining the Circuit Track near the revegetation area on the west side of the reserve, o to determine if the species is still present following the 2015 bushfire • establishes an annual program of data collection if possible.	New medium priority	Council	Internal resources
Rec 14	Investigate opportunities to undertake fungi surveys within the Reserve, potentially in partnership with tertiary institutions and existing networks utilising the established 'FungiMap' (www.fungimap.org.au)	Aspirational	Council and / or Friends Group	$

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
	Management Theme- Vegetation Management (significant Flora Species)			
Rec 15	Ensure anyone undertaking management works near the significant species along the ridge in the Higher Quality Bushland Zones are aware of the location and appearance of the threatened flora species	New high priority	Council and Friends Group	-
Rec 16	Undertake sensitive weed control to conserve and increase the populations of all the threatened flora species: especially the Clover Glycine and Arching Flax-lily.	New high priority	Council and / or Friends Group	-
Rec 17	Ensure any proposed works to the artificial depressions across the reserve consider the indigenous flora species growing within them	Current and on-going	Council and Friends Group	-
Rec 18	Consider defining the threatened species on-the-ground (via stakes or survey tape) so that their location is clear to anyone working in their general vicinity	New high priority	Council	-
Rec 19	Consider installing fencing around the Clover Glycine to protect it from grazing threats.	New high priority	Council	$
	Management Theme- Maintenance (Tracks, Drainage and other Infrastructure)			
Rec 20	Review the design of existing walking tracks and identify possible changes and/or management requirements to improve long term drainage outcomes and minimise the need for drainage ditches.	New medium priority	Council	Internal resources
Rec 21	Until the design and layout of the site's existing walking tracks has been reviewed and any changes implemented, undertake track maintenance works at least twice a year and after heavy rainfall (such as installation of mitre drains) to control erosion and ensure public safety along the walking tracks	Current and on-going	Council	$ annually
Rec 22	Commence removing patches of dense tree/shrub regeneration on the tracks and on either side of the tracks (in the Track Management Zones)	New high priority	Council	$
Rec 23	Retain existing larger trees/shrubs, all ground storey indigenous vegetation and some regenerating, individual trees/shrubs in the Track Management Zones for shade and aesthetics, etc	Current and on-going	Council	Internal resources
Rec 24	Undertake regular tree safety inspections and tree/limb removal as required, for public safety purposes in the Track Management Zones, and retain any chopped trees/limbs in-situ near the walking tracks	New high priority	Council	Internal resources

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
Rec 25	Develop a Facilities Management Plan that sets out annual maintenance requirements for all infrastructure including picnic facilities, tracks and fencing; and identifies the location and specifications for any additional future facilities that may be required	New medium priority	Council	Internal resources
Rec 26	Replace the picnic tables and benches along the walking tracks that were destroyed in the 2015 bushfire	New high priority	Council	$
	Management Theme- Fuel Management			
Rec 27	Implement fuel management areas and works along the Circuit Track taking into account the location of granite boulders, large trees and indigenous ground storey vegetation cover when determining where to locate passing bays	New medium priority	Council	$$
Rec 28	Do not undertake revegetation or plantings in the fuel management areas alongside the Circuit Track	Current and on-going	Council and / or Friends Group	-
Rec 29	Refer to General Reserve Management section below (Do not hold planned events or working bees on Severe, Extreme, Code Red or Total Fire Ban days)	-	-	-
	Management Theme- Bushfire Recovery			
Rec 30	Monitor erosion on the burnt slopes and implement appropriate erosion control measures as required.	New high priority	Council	$
-	Refer to Rec 13 Monitor the reserve's recovery from the January 2015 bushfire through the Flora Monitoring Plan	New medium priority	Council	Internal resources
	Management Theme- Indigenous Fauna Management			
Rec 31	Ensure fauna inspections are undertaken prior to undertaking limb/tree removal works.	New high priority	Council	$
Rec 32	Continue implementation of the Black Hill Fauna Monitoring Plan to facilitate the ongoing collection of data and information about the presence and absence of species, population densities and population changes.	New high priority	Council and / or Friends Group	Internal resources
Rec 33	Develop Native Fauna Management Plans for the reserve as required, with sections on both non-threatened (common) and threatened species, including bats. The section on threatened species will need to be prepared once more information on threatened species within the reserve is known/available.	New medium priority	Council	Internal resources

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
Rec 34	Store data relating to the site's fauna in Council's existing Natural Resource Management Database or similar and complement with maps, GIS layers and other databases as required.	New medium priority	Council	Internal resources
Rec 35	Utilise fauna data when planning/undertaking management works to determine if additional fauna assessments and mitigation measures are required.	Current and on-going	Council	Internal resources
Rec 36	Submit sightings of rare or threatened species to the Victorian Biodiversity Atlas, the Atlas of Living Australia and BirdLife Australia's Atlas of Australian Birds.	Current and on-going	Council	$
Rec 37	Prepare regular fauna monitoring reports that document the outcomes of fauna monitoring activities	New medium priority	Council	$
Rec 38	Continue to inspect the exiting nestboxes in the site on a regular basis as a part of the implementation of the Black Hill Fauna Monitoring Plan	Current and on-going	Council	Internal resources
Rec 39	Install signage along the walking tracks under some of nest boxes, to provide information about their use in the Reserve.	Aspirational	Council	$
	Management Theme- Pest Animal Management			
Rec 40	Continue to collect baseline data on native and introduced fauna to assist in development of a targeted pest animal program through increased understanding of the ecological relationships within the reserve (refer to the Black Hill Fauna Monitoring Plan)	Current and on-going	Council	Internal resources
Rec 41	Prepare and implement a targeted pest animal management program specific to identified pest species including foxes, rabbits and feral cats	Current and on-going	Council	Internal resources
Rec 42	Monitor the outcome of pest animal control efforts to determine level of success and evaluate program for future implementation.	Current and on-going	Council	Internal resources
Rec 43	Undertake community engagement aimed at encouraging surrounding land owners to implement complementary pest animal control works.	Aspirational	Council	$
Rec 44	Conduct research into successful reserve fencing that allows for the movement of native wildlife and prevents cats and other pest animals from entering the reserve.	Aspirational	Council	$$$$

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
	Management Theme- Indigenous Fauna Management (Domestic Animals)			
Rec 45	Continue to implement shire-wide campaigns encouraging land owners to secure their pets.	Current and on-going	Council	Internal resources
	Management Theme- Adjacent Land Uses			
Rec 46	Remove the fencing between the eastern perimeter of the reserve and the adjacent unformed road reserve to reduce the barriers to fauna movement into/out of the reserve	New medium priority	Council	Internal resources
Rec 47	Investigate incorporating the unformed Parsell Road reserve into the reserve	New medium priority	Council	Internal resources
Rec 48	Investigate creating a wildlife corridor along the unformed road reserve to the east of the reserve	Aspirational	Council	$$$
	Management Theme- Maintenance			
Rec 49	Remove the pile of wire along the western perimeter of the reserve	New medium priority	Council	Internal resources
Rec 50	Undertake maintenance works along the unburnt sections of perimeter fencing	New medium priority	Council	Internal resources
Rec 51	Investigate upgrading the current fencing at the entrance to the reserve by: o Extending the post and rail fence to the north-west o Replacing the fence to the south-west with a four strand wire fence	Completed 2016	Council	$
Rec 52	Adjust the access arrangements at the secondary entrance to the reserve (Parsell Road) to prevent vehicle, motorbike, mountain bike and horse access.	Completed 2016	Council	$
	Management Theme- Indigenous Fauna Management (Fencing and Dam Management)			
Rec 53	All future fencing should be designed to minimise injury to wildlife.	Current and on-going	Council	-
Rec 54	Refer to General Reserve Management section below (Investigate a more regular official management presence within the reserve to facilitate greater compliance with the reserve's regulations)	-	-	-
Rec 55	Install remote cameras at the permanent dams to record fauna activity surrounding the dams	New high priority	Council and / or Friends group	$

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
Rec 56	Retain all existing dams within the reserve	Current and on-going	Council	-
	Management Theme- General Reserve Management			
Rec 29	Do not hold planned events or working bees on Severe, Extreme, Code Red or Total Fire Ban days	Current and on-going	Council and / or Friends Group	-
Rec 54	Investigate a more regular official management presence within the reserve to facilitate greater compliance with the reserve's regulations	New high priority	Council	$$
Rec 57	Do not permit horse riding, mountain biking or motorbike riding at the reserve and secure/modify the reserve's access points to restrict access accordingly	New high priority	Council	$
Rec 58	Liaise with relevant rock climbing clubs to raise awareness about the reserve's natural values amongst their members.	New medium priority	Council	Internal resources
Rec 59	Do not permit additional rock climbing pins to be installed in the rocks.	Current and on-going	Council	-
Rec 60	Do not permit orienteering during the fire recovery phase. Review the appropriateness of orienteering in 2020. Orienteering should not occur in the Higher Quality bushland areas of the Reserve.	Current and on-going	Council	Internal resources
Rec 61	Undertake an ecological impact assessment for proposed recreation activities, if required, as a part of the investigation process and refer proposals to Council's environment unit for approval.	If and when required	Group making proposal	$
	Management Theme- Signage			
Rec 62	Progressively implement Council's Bushland Reserves Signage Template to ensure new signage is consistent, effective and clearly advises visitors about the reserve's regulations including: - Dogs on lead - No dumping of green waste - No horse riding - No mountain bike riding - No motorbike riding - No fire wood collection - Take your rubbish home - Pick up after your dog	New high priority	Council	$ annually

Rec/ Action Number	Action/Recommendation	Priority	Who?	Resources Required
Rec 63	Review the directional signage to the reserve from different approaches and identify locations for new directional signs as required.	New medium priority	Council	$
	Management Theme- Heritage			
Rec 64	Conduct a preliminary Aboriginal Cultural Heritage Study or "walk over" of the reserve that identifies possible areas/sites of significance in collaboration with relevant aboriginal groups. Consider commissioning more detailed studies if required in the future.	New medium priority	Council	$
	Management Theme- General Reserve Management (Machinery Hygiene)			
Rec 65	Ensure Council staff and contractors entering Black Hill Reserve are included in Council's vehicle hygiene program.	New high priority	Council	Internal resources
	Management Theme- General Reserve Management (Pine Plantation)			
Rec 66	Install signs warning people to keep out of the pine plantations due to potential falling hazards. If this proves ineffective, consider restricting access to the area.	New medium priority	Council	$
Rec 67	If funding becomes available, prepare and implement a plan for the removal of the pine plantation and then revegetation, to incorporate the area into the rest of the reserve.	Aspirational	Council	$
Rec 68	Remove any pine saplings in the vicinity of the pine plantation as a priority.	New high priority	Council	$
	Management Theme- Indigenous Fauna (Community Engagement)			
Rec 69	Conduct additional community engagement about possible support for threatened species introduction programs with the aim of addressing some of the queries raised during the community consultation for the draft EMP.	Low / Aspirational	Council	Internal resources
	Management Theme- Reserve Access			
Rec 70	Install locks/gates at each of the access points, to restrict reserve access. Provide a key to the north west gate to the adjoining landowner to enable the existing fire track maintenance to continue.	New high priority	Council	$
Rec 71	Ensure access gate locks can be opened by CFA crews, if required	Current and on-going	Council	-
	Management Theme- EMP Evaluation and Review			
Rec 72	Undertake a comprehensive review of the Environmental Management Plan in 2020. Monitor the implementation of the plan in the meantime and consider making any updates as required, via a Council resolution, including to the actions and species lists	Current and on-going	Council	$$

5. MONITORING AND EVALUATION

Several sections concerning the ecological values of the reserve and the risks to these values have discussed the need for some monitoring, within this EMP.

Monitoring and evaluation is an important component of any ecological management works. Monitoring can be utilised to collect baseline data and to monitor the effectiveness (or not) of proposed management works.

5.1 Monitoring

As outlined in Sections 8.4 and 8.11, flora and fauna monitoring programs are integral to guiding the management of Black Hill Reserve into the future, and into making informed management decisions regarding plant densities, erosion control and potential control of naturalised tree/shrub species in some areas of the reserve.

Whilst the reserve is a mixed bushland landscape, the 2015 bushfire has provided the opportunity to make informed management decisions in some of the higher quality bushland areas of the reserve regarding the removal of regenerating naturalised tree/shrub species, to encourage the regeneration of indigenous vegetation communities/EVCS in these areas, which will represent a more indigenous landscape.

The mixed bushland landscape will be retained in the lower quality bushland areas of the reserve, as the mixture of indigenous and native plants do provide a diversity of habitats, especially for the birds.

Details of the proposed monitoring are provided in Sections 8.4 and 8.11, and throughout this EMP.

To facilitate monitoring and evaluation, it is recommended that Council prepare a Flora Monitoring Action Plan for the reserve. Council should also continue implementing the current Fauna Monitoring Action Plan.

These action plans could build on the survey work conducted during the preparation of the EMP as outlined at Section 2 of this document.

It is recommended that the Action Plans establish key ecological/environmental indicators to help monitor the health of the reserve and to assist in assessing the success of the Environmental Management Plan.

Activities to be considered in the Monitoring Action Plans include:

Activity	Survey Frequency
Bird surveys of 2 ha census areas	Annually
Indigenous ground-storey vegetation quality mapping	Every 5 years
Checking of nest boxes	Four times a year as per the current program
Installation of wildlife cameras	at least twice per year (autumn and spring) as per the current program
Spot light surveys for native and pest animals	At least twice per year (autumn and spring)
Rabbit burrow surveys	Annually
Scat surveys and analysis	Annually
Invertebrate surveys	Every 3 to 5 years
Amphibian surveys	Every 3 to 5 years
Fungi surveys	Every 3 to 5 years
Reptile surveys	Every 3 to 5 years
Installation and surveying of monitoring plots	Annually

5.2 Evaluation and Review

It is recommended that this EMP be reviewed at least every 10 years to ensure its principles and actions are still relevant. It is recommended that this review comprise an audit of the Plan's actions as well as an evaluation of the Plan's objectives utilising the data collected as part of the implementation of the Post-bushfire, Fauna and Flora Monitoring Action Plans.

This EMP has considered current known management issues and concerns, and made appropriate recommendations with regards to these. It is acknowledged the EMP may require some adjustments to continue the effective management of Black Hill Reserve, and that some issues may not have been apparent at the time of preparing the EMP. Consequently more regular internal reviews and updates may be required throughout the plan's implementation.

Recommendations

Rec 72. Undertake a comprehensive review of the Environmental Management Plan in 2020. Monitor the implementation of the plan in the meantime and consider making any updates as required, via a Council resolution, including to the actions and species lists.

Appendix 1. References

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Appendix 2. Black Hill Reserve Flora Species List

The flora list below is a compilation of the known flora species lists for the site.

Due to the mixture of planted and indigenous species at Black Hill, the flora lists attempt to only record indigenous and self-seeded plants that have originated from planted species. However it is difficult to positively identify what species are self-seeded from planted species in some instances, so there are likely to be mistakes with the species identified as naturalised.

The references and data used to compile the flora species list are outlined below:

1) Lois Prictor (1987). Species list compiled between 1979 and 1987.
2) Ern Perkins (2010). Species survey undertake 24/01/2010)
3) Practical Ecology Pty Ltd (surveys undertaken spring/summer 2015/2016)

The flora species table indicates the species observed during the three flora survey periods. This list is not exhaustive. If a species is not listed, this does not mean it does not occur within the reserve, or that it no longer grows within the reserve if it was recorded in a previous survey, but not in the more recent surveys.

Key to Species List

*	Introduced plants
#	Species which is native to Victoria but is naturalised outside of natural range. Species may be an Environmental Weed.
s.l.	Sensu latu : in the broad sense
s.s.	Sensu stricta: in the strict sense

The key to the threatened species **status** is provided at the bottom of the flora results table.

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
#	*Acacia baileyana*	Cootamundra Wattle					X	X	
	Acacia dealbata subsp. dealbata	Silver Wattle				X	X	X	
#	*Acacia floribunda*	White Sallow-wattle					X	X	
	Acacia genistifolia	Spreading Wattle						X	
#	*Acacia howittii*	Sticky Wattle						X	
	Acacia implexa	Lightwood				X	X	X	
#	*Acacia longifolia subsp. longifolia*	Sallow Wattle					X	X	
	Acacia mearnsii	Black Wattle				X	X	X	
	Acacia melanoxylon	Blackwood				X	X	X	
	Acacia paradoxa	Hedge Wattle						X	
#	*Acacia pravissima*	Ovens Wattle							X
*	*Acacia prominens*	Gosford Wattle					X	X	
#	*Acacia provincialis*	Wirilda						X	
	Acacia pycnantha	Golden Wattle					X		
#	*Acacia terminalis*	Sunshine Wattle						X	
	Acaena agnipila	Hairy Sheep's Burr						X	
	Acaena echinata	Sheep's Burr					X	X	
	Acaena novae-zelandiae	Bidgee Widgee				X	X		X

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
*	*Acetosella vulgaris*	Sheep Sorrel					X	X	
	Acrotriche serrulata	Honey-pots				X	X	X	
*	*Agrostis capillaris var. capillaris*	Brown-top Bent					X	X	
	Agrostis sp	Blown Grass				X			
*	*Agrostis stolonifera*	*Creeping Bent*							X
*	*Aira caryophyllea subsp. caryophyllea*	Silvery Hair-grass						X	
*	*Aira cupaniana*	Quicksilver Grass						X	
*	*Aira elegantissima*	Delicate Hair-grass						X	
	Alternanthera denticulata s.l.	Lesser Joyweed						X	
	Amphibromus fluitans	*River Swamp Wallaby-grass*	VU						X
	Amphibromus nervosus	Common Swamp Wallaby-grass						X	
	Amyema pendula	Drooping Mistletoe				X	X	X	
*	*Anagallis arvensis var. arvensis*	Scarlet Pimpernel					X	X	
*	*Anagallis arvensis var. caerulea*	Blue Pimpernel						X	
	Anthosachne scabra s.l.	Common Wheat-grass				X		x	
*	*Anthoxanthum odoratum*	Sweet Vernal-grass						x	
*	*Aphanes arvensis*	Parsley Piert					X	X	
	Aphanes australiana	Australian Piert						X	
	Aphelia gracilis	*Slender Aphelia*							X
	Aphelia pumilio	Dwarf Aphelia							X
*	*Arctotheca calendula*	Cape Weed					X	X	
	Arthropodium minus	Small Vanilla Lily				X	X		X
	Arthropodium sp. 3 (aff. strictum)	Small Chocolate-lily						X	
	Arthropodium strictum s.l.	Chocolate Lily				X	X	X	
	Asplenium flabellifolium	Necklace Fern				X	X	X	
	Astroloma humifusum	Cranberry Heath				X	X	X	
	Austrostipa densiflora	Dense Spear-grass							X
	Austrostipa scabra subsp. falcata	Rough Spear-grass						X	
	Austrostipa semibarbata	Fibrous Spear-grass						X	
	Austrostipa sp	Spear-grass				X	X		
*	*Avena barbata*	Bearded Oat						X	
	Banksia marginata	Silver Banksia				X	X		
	Bossiaea prostrata	Creeping Bossiaea						X	
	Brachyscome perpusilla	*Rayless Daisy*							X
*	*Briza maxima*	Large Quaking-grass					X	X	
*	*Briza minor*	Lesser Quaking-grass						X	
*	*Bromus diandrus*	Great Brome						X	
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome						X	
*	*Bromus madritensis*	Madrid Brome							X

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
*	*Bromus rubens*	Red Brome						X	
	Brunonia australis	Blue Pincushion				X	X	X	
	Bulbine bulbosa	Bulbine Lily				X	X	X	
	Burchardia umbellata	Milkmaids				X	X	X	
	Caladenia carnea s.l.	Pink Fingers				X	X		X
	Caladenia clavescens	Castlemaine Spider Orchid					X		
	Caladenia concolor	Crimson Spider Orchid				X			
	Caladenia dilatata s.l.	Green-com Spider Orchid				X	X		
	Caladenia gracilis	Musky Orchid				X	X		
	Caladenia moschata	Musk Hood-orchid							X
	Caladenia parva	Small Spider-orchid							X
	Caladenia patersonii s.l.	Common Spider Orchid				X			
	Calandrinia calyptrata	Pink Purslane				X	X	X	
#	*Callistemon citrinus*	Crimson Bottlebrush						X	
#	*Callistemon salignus*	Weeping Bottlebrush					X		
#	*Callistemon spp*	Bottlebrush					X		X
	Callitriche palustris var. palustris	Swamp Water-starwort							X
	Callitriche umbonata	Winged Water-starwort			r				X
	Callitriche sonderi	Matted Water-starwort						X	
*	*Cardamine hirsuta*	Common Bitter-cress					X		X
*	*Carduus tenuiflorus*	Winged Slender-thistle						X	
	Carex appressa	Tall Sedge					X	X	
	Carex iynx	Tussock Sedge						X	
	Carex tereticaulis	Poong'ort						X	
	Cassinia aculeata	Common Cassinia							X
	Cassinia arcuata	Drooping Cassinia				X	X	X	
	Cassinia longifolia	Shiny Cassinia					X		X
*	*Centaurium erythraea*	Common Centaury						X	
*	*Centaurium tenuiflorum*	Branched Centaury					X		
	Centipeda cunninghamii	Common Sneezeweed						X	
	Centrolepis aristata	Pointed Centrolepis						X	
	Centrolepis glabra	Smooth Centrolepis							X
	Centrolepis strigosa subsp. strigosa	Hairy Centrolepis				X	X	X	
*	*Cerastium comatum*	Levantine Mouse-ear Chickweed							X
*	*Cerastium glomeratum s.l.*	Common Mouse-ear Chickweed					X	X	
	Cheilanthes austrotenuifolia	Green Rock Fern				X	X		
	Cheilanthes sieberi subsp. sieberi	Narrow Rock-fern						X	
	Chiloglottis gunnii s.l.	Common Bird Orchid				X	X		
*	*Chondrilla juncea*	Skeleton Weed						X	
	Chrysocephalum apiculatum	Common Everlasting				X	X	X	
	Chrysocephalum semipapposum	Clustered Everlasting						X	
*	*Cicendia filiformis*	Slender Cicendia							X

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
*	*Cicendia quadrangularis*	Square Cicendia						X	
*	*Cirsium vulgare*	Spear Thistle					X	X	
	Clematis decipiens	Slender Clematis							X
	Clematis microphylla s.l.	Small-leaved Clematis				X	X		
	Convolvulus angustissimus subsp. angustissimus	Blushing Bindweed						X	
*	*Convolvulus arvensis*	Blushing Bindweed					X		
	Convolvulus erubescens s.l.	Pink Bindweed				X			
*	*Conyza bonariensis*	Flaxleaf Fleabane						X	
	Coronidium scorpioides	Button Everlasting						X	
	Corybas diemenicus s.l.	Veined Helmet-orchid				X			
	Corybas Incurvus	Slaty Helmet-orchid					X		
	Craspedia glauca spp. agg.	Common Billy Buttons				X	X		
	Craspedia variabilis	Variable Billy-buttons							X
*	*Crassula alata var. alata*	Three-part Crassula							X
	Crassula decumbens var. decumbens	Spreading Crassula				X	X	X	
*	*Crassula natans var. minus*	Water Crassula							X
	Crassula peduncularis	Purple Crassula						X	
	Crassula sieberiana s.l.	Sieber Crassula				X	X	X	
*	*Crataegus monogyna subsp. monogyna*	Hawthorn						X	
	Cymbonotus preissianus	Austral Bear's-ear				X	X	X	
	Cynoglossum suaveolens	Sweet Hound's-tongue				X	X	X	
*	*Cynosurus echinatus*	Rough Dog's-tail					X	X	
*	*Cyperus eragrostis*	Drain Flat-sedge					X	X	
	Daucus glochidiatus	Australian Carrot						X	
	Dianella admixta	Black-anther Flax-lily				X	X	X	
	Dianella sp. aff. longifolia (Benambra),	Arching Flax-lily			v			X	
	Dichelachne sp	Plume Grass				X			
	Dillwynia cinerascens s.l.	Grey Parrot-pea				X	X	X	
*	*Disa bracteata*	South African Orchid						X	
*	*Dittrichia graveolens*	Stinkweed					X		
	Diuris behrii	Golden Cowslips			v				X
	Diuris lanceolata s.l.	Golden Moths				X	X		
	Diuris sulphurea	Tiger Orchid					X		
#	*Dodonaea viscosa subsp. cuneata*	Wedge-leaf Hop-bush							X
	Drosera aberrans	Scented Sundew							X
	Drosera auriculata	Tall Sundew				X	X	X	
	Drosera peltata	Pale Sundew						X	
	Drosera whittakeri	Scented Sundew				X	X		
	Elatine gratioloides	Waterwort							X
	Eleocharis acuta	Common Spike-sedge						X	
	Eleocharis atricha	Tuber Spike-sedge						X	
	Epilobium billardierianum subsp. billardierianum	Smooth Willow-herb							X

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
	Epilobium billardierianum spp. cinera	Grey Willow-herb					X		
	Epilobium hirtigerum	Hairy Willow-herb						X	
	Epilobium sp	Willow-herb				X			
	Eragrostis brownii	Common Love-grass						X	
*	*Erodium botrys*	Big Heron's-bill					X	X	
	Eucalyptus dives	Broad-leaved Peppermint					X		
#	*Eucalyptus globulus subsp. globulus*	Southern Blue-gum						X	
	Eucalyptus goniocalyx s.l.	Bundy					X	X	
	Eucalyptus melliodora	Yellow Box				X	X	X	
	Eucalyptus obliqua	Messmate Stringybark				X	X	X	
	Eucalyptus ovata var. ovata	Swamp Gum					X	X	
	Eucalyptus polyanthemos subsp. vestita	Red Box						X	
	Eucalyptus radiata subsp. radiata	Narrow-leaf Peppermint				X	X		
	Eucalyptus rubida subsp. rubida	Candlebark				X	X	X	
#	*Eucalyptus tricarpa subsp. tricarpa*	Red Ironbark						X	
	Eucalyptus viminalis subsp. viminalis	Manna Gum				X	X	X	
	Euchiton involucratus s.s.	Tiny Cudweed				X	X		
	Euchiton japonicus	Creeping Cudweed						X	
	Exocarpos cupressiformis	Cherry Ballart				X	X	X	
*	*Galium aparine*	Cleavers							X
	Galium binifolium	Reflexed Bedstraw						X	
	Galium gaudichaudii	Rough Bedstraw				X	X		X
*	*Galium murale*	Small Goosegrass							X
*	*Gamochaeta purpurea s.l.*	Purple Cudweed						X	
*	*Genista monspessulana*	Montpellier Broom							X
	Geranium gardneri	Rough Crane's-bill							X
	Geranium potentilloides	Soft Crane's-bill				X	X		
	Geranium retrorsum s.l.	Grassland Crane's-bill							X
	Geranium sp. 2	Variable Crane's-bill						X	
	Geranium sp. 3	Pale-flower Crane's-bill			r				X
	Geranium sp. 5	Naked Crane's-bill							X
*	*Gladiolus undulatus*	Wild Gladiolus						X	
	Glossodia major	Wax-lip Orchid				X	X		X
	Glossostigma elatinoides	Small Mud-mat						X	
	Glycine clandestina	Twining Glycine				X	X		
	Glycine latrobeana	Clover Glycine	VU	L	v				X
	Gonocarpus tetragynus	Common Raspwort				X	X	X	
	Gnaphalium indutum	Tiny Cudweed							X
*	*Grevillea hybrids (naturalized)*	Grevillea hybrids and cultivars						X	

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
	Hakea decurrens subsp. physocarpa	Bushy Needlewood							X
#	*Hakea spp.*	Hakea					X		X
	Hardenbergia violacea	Purple Coral-pea				X	X		
	Helichrysum scorpioides	Button Everlasting				X	X		
*	*Helminthotheca echioides*	Ox-tongue							X
*	*Holcus lanatus*	Yorkshire Fog						X	
*	*Hordeum glaucum*	Northern Barley-grass						X	
	Hovea linearis	Common Hovea				X	X		
	Hyalosperma demissum	Moss Sunray						X	
	Hydrocotyle callicarpa	Small Pennywort							X
	Hydrocotyle capillaris	Pennywort				X			
	Hydrocotyle foveolata	Yellow Pennywort							X
	Hydrocotyle laxiflora	Stinking Pennywort				X	X	X	
	Hypericum gramineum	Small St John's Wort				X	X	X	
*	*Hypochaeris glabra*	Smooth Cat's-ear					X	X	
*	*Hypochaeris radicata*	Flatweed					X	X	
	Hypoxis glabella	Yellow Star				X	X		
	Indigofera australis	Austral Indigo				X	X	X	
	Isoetopsis graminifolia	Grass Cushion							X
	Isolepis cernua var. platycarpa	Broad-fruit Club-sedge							X
	Isolepis fluitans var. fluitans	Floating Club-sedge						X	
	Isolepis hookeriana	Grassy Club-sedge						X	
*	*Isolepis hystrix*	Awned Club-sedge						X	
	Isolepis inundata	Swamp Club-sedge						X	
	Isolepis marginata	Little Club-sedge							X
*	*Isolepis levynsiana*	Tiny Flat-sedge					X	X	
	Isolepis sp	Club Rush				X			
	Isotoma axillaris	Rock Isotome						X	
	Juncus amabilis	Hollow Rush					X	X	
	Juncus bufonius	Toad Rush				X	X	X	
*	*Juncus capitatus*	Capitate Rush						X	
	Juncus holoschoenus	Joint-leaf Rush				X	X	X	
	Juncus pallidus	Pale Rush				X	X	X	
	Juncus planifolius	Broad-leaf Rush						X	
	Juncus remotiflorus	Diffuse Rush					X	X	
	Juncus sarophorus	Broom Rush					X	X	
	Juncus subsecundus	Finger Rush					X	X	
	Kennedia prostrata	Running Postman				X	X	X	
#	*Kunzea ericoides spp. agg.*	Burgan						X	
	Lachnagrostis filiformis s.l.	Common Blown-grass						X	
*	*Lactuca serriola*	Prickly Lettuce						X	
*	*Lamarckia aurea*	Golden-top							X
*	*Lathyrus tingitanus*	Tangier Pea							X
*	*Leontodon taraxacoides subsp. taraxacoides*	Hairy Hawkbit						X	
	Lepidium pseudotasmanicum	Shade Peppercress							X
	Lepidosperma laterale	Variable Sword-sedge				X	X		X

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
	Leptorhynchos squamatus subsp. squamatus	Scaly Buttons				X	X	X	
	Leucopogon virgatus	Common Beard Heath				X	X		
	Levenhookia dubia	Hairy Style-wort				X	X		X
	Limosella australis	Austral Mudwort						X	
	Lobelia pedunculata s.l.	Matted Pratia							X
*	*Lolium perenne var. perenne*	Perennial Rye-grass						X	
	Lomandra filiformis	Wattle Mat-rush				X	X		
	Lomandra filiformis subsp. coriacea	Wattle Mat-rush						X	
	Lomandra longifolia	Spiny-headed Mat-rush				X	X		
	Lomandra longifolia subsp. exilis	Cluster-headed Mat-rush						X	
	Lomandra nana	Dwarf Mat-rush						X	
	Luzula meridionalis var. densiflora	Common Woodrush							X
	Luzula meridionalis var. flaccida	Common Woodrush						X	
	Luzula meridionalis var. meridionalis	Common Woodrush						X	
	Luzula sp	Woodrush				X			
*	*Lycium ferocissimum*	African Boxthorn					X		
	Lythrum hyssopifolia	Small Loosestrife				X	X	X	
#	*Melaleuca armillaris*	Bracelet Honey-myrtle					X		X
#	*Melaleuca decussata*	Totem-poles					X	X	
#	*Melaleuca liniarifolia*	Snow in Summer					X		
#	*Melaleuca parvistaminea*	Rough-barked Honey-myrtle						X	
#	*Melaleuca styphelioides*	Prickly Paperbark						X	
	Melicytus dentatus s.l.	Tree Violet				X	X	X	
	Microlaena stipoides var. stipoides	Weeping Grass				X	X	X	
	Microseris scapigera	Yam daisy				X	X		
	Microtis parviflora	Slender Onion-orchid				X	X	X	
	Microtis unifolia	Common Onion-orchid				X	X	X	
	Millotia tenuifolia var. tenuifolia	Soft Millotia					X	X	
*	*Moenchia erecta*	Erect Chickweed						X	
	Montia fontana	Water Blinks							X
	Myosotis australis	Austral Forget-me-not				X	X		
*	*Myosotis discolor*	Yellow-and-blue Forget-me-not							X
	Myriophyllum crispatum	Upright Water-milfoil						X	
	Myriophyllum integrifolium	Tiny Water-milfoil						X	
	Myriophyllum simulans	Amphibious Water-milfoil							X
*	*Oxalis articulata*	Sourgrass						X	
	Oxalis corniculata	Yellow Wood-sorrel				X			X
	Oxalis exilis	Shady Wood-sorrel						X	

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
	Oxalis perennans	Grassland Wood-sorrel					X	X	
	Ozothamnus obcordatus	Grey Everlasting				X	X		
*	*Parentucellia latifolia*	Red Bartsia							X
*	*Paspalum distichum*	Water Couch							X
	Pauridia vaginata var. vaginata	Yellow Star							X
	Pelargonium rodneyanum	Magenta Stork's-bill				X	X	X	
	Pentapogon quadrifidus var. quadrifidus	Five-awned Spear-grass						X	
	Persicaria prostrata	Creeping Knotweed						X	
*	*Petrorhagia dubia*	Velvety Pink						X	
*	*Phalaris aquatica*	Toowoomba Canary-grass					X	X	
	Pilularia novae-hollandiae	Austral Pillwort						X	
	Pimelea curviflora	Curved Rice-flower				X	X		X
	Pimelea humilis	Common Rice-flower				X	X	X	
	Pimelea linifolia	Slender Rice-flower				X	X	X	
*	*Pinus radiata var. radiata*	Radiata Pine					X	X	
*	*Plantago lanceolata*	Ribwort						X	
	Plantago varia	Variable Plantain				X	X	X	
	Platylobium formosum	Handsome Flat-pea				X	X		
	Platylobium montanum ssp. prostratum	Handsome Flat-pea			k			X	
	Pleurosorus rutifolius	Blanket Fern				X	X		
*	*Poa annua*	Annual Meadow-grass							X
*	*Poa bulbosa var. bulbosa*	Bulbous Meadow-grass						X	
	Poa labillierdieria	Common Tussock-grass				X	X		
	Poa morrisii	Soft Tussock-grass						X	
	Poa sieberiana var. hirtella	Grey Tussock-grass						X	
	Poa sieberiana var. sieberiana	Grey Tussock-grass				X	X	X	
	Poranthera microphylla s.l.	Small Poranthera				X	X	X	
*	*Prunus cerasifera*	Cherry Plum						X	
	Pseudognaphalium luteoalbum	Jersey Cudweed						X	
	Pteridium esculentum	Austral Bracken				X	X	X	
	Pterostylis alpine	Alpine Greenhood					X		
	Pterostylis longifolia	Tall Greenhood				X	X		
	Pterostylis nutans	Nodding Greenhood				X	X		X
	Pultenaea pedunculata	Matted Bush-pea				X	X	X	
	Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup							X
*	*Romulea minutiflora*	Small-flower Onion-grass						X	
*	*Romulea rosea var. australis s.s.*	Common Onion-grass					X	X	
	Rumex brownii	Common Bog-sedge					X		X
	Rytidosperma caespitosum	Common Wallaby-grass						X	
	Rytidosperma erianthum	Hill Wallaby-grass						X	
	Rytidosperma fulvum	Copper-awned Wallaby-grass						X	

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
	Rytidosperma geniculatum	Kneed Wallaby-grass						X	
	Rytidosperma laeve	Smooth Wallaby-grass						X	
	Rytidosperma racemosum var. racemosum	Slender Wallaby-grass						X	
	Rytidosperma semiannulare	Wetland Wallaby-grass						X	
	Rytidosperma setaceum var. setaceum	Bristly Wallaby-grass						X	
	Rytidosperma spp.	Wallaby Grass				X	X	X	
*	*Salix cinerea*	Grey Sallow						X	
	Schoenus apogon	Common Bog-sedge				X	X	X	
	Seboea ovata	Yellow Seboa				X	X		
	Senecio bathurstianus	Dissected Fireweed						X	
	Senecio campylocarpus	Floodplain Fireweed			r			X	
	Senecio glomeratus subsp. glomeratus	Annual Fireweed						X	
	Senecio hispidulus s.l.	Rough Fireweed				X	X	X	
	Senecio linearifolius	Fireweed Groundsel				X	X		
	Senecio linearifolius var. linearifolius	Fireweed Groundsel (type variant)							X
	Senecio minimus	Shrubby Fireweed						X	
	Senecio phelleus	Stony Fireweed					X	X	
	Senecio prenanthoides	Beaked Fireweed						X	
	Senecio quadridentatus	Cotton Fireweed				X	X	X	
	Siloxerus multiflorus	Small Wrinklewort						X	
	Solanum laciniatum	Large Kangaroo Apple				X	X	X	
*	*Solanum nigrum s.l.*	Black Nightshade						X	
	Solenogyne dominii	Smooth Solenogyne						X	
*	*Sonchus asper s.s.*	Rough Sow-thistle						X	
*	*Sonchus oleraceus*	Common Sow-thistle						X	
	Stackhousia monogyna	Creamy Candles				X			
*	*Stellaria pallida*	Lesser Chickweed					X		X
*	*Stellaria media*	Chickweed						X	
	Stellaria pungens	Prickly Starwort				X	X	X	
	Stuartina muelleri	Spoon Cudweed						X	
	Stylidium graminifolium s.s.	Grass Triggerplant				X	X	X	
	Tetratheca ciliata	Pink Bells				X	X		X
	Thelymitra arenaria	Forest Sun-orchid						X	
	Thelymitra brevifolia	Peppertop Sun-orchid							X
	Thelymitra pauciflora s.s.	Slender Sun-orchid				X	X	X	
	Thelymitra rubra	Salmon Sun-orchid				X	X		X
	Themeda triandra	Kangaroo Grass				X	X	X	
	Thysanotus patersonii	Twining Fringe-lily				X	X	X	
	Thysanotus tuberosus	Common Fringe-lily				X	X	X	
	Tricoryne elatior	Yellow Rush-lily				X	X	X	
*	*Trifolium arvense var. arvense*	Hare's-foot Clover						X	
*	*Trifolium campestre var. campestre*	Hop Clover						X	
*	*Trifolium cernuum*	Drooping-flower Clover						X	

Origin	Scientific Name	Common Name	EPBC	FFG	VROT	Prictor 1987	Perkins 2010	PE 2015	PE 2016
*	*Trifolium dubium*	Suckling Clover						X	
*	*Trifolium glomeratum*	Cluster Clover						X	
*	*Trifolium subterraneum*	Subterranean Clover						X	
	Triglochin nana	Dwarf Arrowgrass							X
	Triptilodiscus pygmaeus	Common Sunray				X	X		X
	Typha domingensis	Narrow-leaf Cumbungi						X	
	Typha sp	Cumbungi				X	X		
*	*Ulex europaeus*	Gorse					X	X	
*	*Vellereophyton dealbatum*	White Cudweed						X	
*	*Verbascum virgatum*	Twiggy Mullein							X
	Veronica plebeia	Trailing Speedwell							X
*	*Vicia hirsuta*	Tiny Vetch							X
*	*Vicia sativa subsp. nigra*	Narrow-leaf Vetch						X	
*	*Vinca major*	Blue Periwinkle						X	
	Viola betonicifolia	Showy Violet				X	X		
	Viola hederacea sensu Entwisle (1996)	Ivy-leaf Violet					X	X	
*	*Vulpia bromoides*	Squirrel-tail Fescue						X	
*	*Vulpia myuros f. myuros*	Rat's-tail Fescue						X	
	Wahlenbergia communis	Tufted Bluebell				X			
	Wahlenbergia gracilis	Sprawling Bluebell							X
	Wahlenbergia graniticola s.l.	Granite Bluebell						X	
	Wahlenbergia gymnoclada	Naked Bluebell				X			
	Wahlenbergia luteola	Bronze Bluebell							X
	Wahlenbergia multicaulis	Branching Bluebell						X	
	Wahlenbergia spp.	Bluebell					X		
	Wahlenbergia stricta subsp. stricta	Tall Bluebell				X	X	X	
*	*Watsonia meriana var. bulbillifera*	Bulbil Watsonia						X	
	Wurmbea dioica subsp. dioica	Common Early Nancy				X	X	X	
	Xerochrysum bracteatum	Golden Everlasting				X			
	Xerochrysum viscosum	Shiny Everlasting					X	X	

Conservation status under EPBC Act 1999:

EX: Extinct, **CR:** Critically endangered, **EN:** Endangered, **VU:** Vulnerable and **CD:** Conservation dependant

Conservation status under FFG Act 1988:

L: Listed, **N:** Nominated, **I:** Invalid or ineligible, **R:** Rejected and **D:** Delisted

Conservation status of Threatened Flora in Victoria (DSE 2005)

x: Presumed extinct, **e:** Endangered, **v:** Vulnerable, **r:** rare and **k:** poorly known

Definitions of Conservation Status Codes can be found on the DSE website under Advisory List of Rare or Threatened Plants

Appendix 3. Planted Flora Species at Black Hill

The following table attempts to list all of the native species planted at Black Hill. The bulk of this species list was obtained from the article 'Regeneration' written by Alan Thomson from the Pascoe Vale Naturalists Club in *A Walk Through Black Hill* (Prictor, 1987).

This list has been supplemented with naturalised species noted in the three flora species presented in Appendix 1.

Due to the age of the original species list (1987), many of the botanical or common names of the species have altered. The species names listed below are according to the VBA (DELWP 2015).

Revised Botanical Name (VBA 2015)	Revised Common Name (VBA 2015)	Origin	Notes
Acacia baileyiana	Cootamundra Wattle	NSW	
Acacia dealbata	Silver Wattle		
Acacia floribunda	White Sallow-Wattle	NSW, QLD & VIC	
Acacia howittii	Sticky Wattle		
Acacia longifolia subsp. longifolia	Sallow Wattle	NSW, QLD & VIC	
Acacia mearnsii	Black Wattle		
Acacia melanoxylon	Blackwood		
Acacia pravissima	Ovens Wattle	VIC & NSW	
Acacia prominens	Gosford Wattle	NSW	
Acacia provincialis	Wirilda		
Acacia pycnantha	Golden Wattle		
A. longifolia subsp sophorae	Coast Wattle	NSW, QLD, VIC & TAS	
Acacia terminalis	Sunshine Wattle		
B. spinulosa var. cunninghamii	Hairpin Banksia		
Calothamnus gilesii	Giles Net Bush	WA	
Callistemon citrinus	Crimson Bottlebrush		
Callistemon 'Lilacinus'	Lilac Bottlebrush		Horticultural cultivar
Callistemon linearis	Narrow-leaved Bottlebrush	NSW & QLD	
Callistemon pinifolius	Pine-leaved Bottlebrush	NSW	Also considered to be M. linearis
Callistemon rugulosus	Scarlet Bottlebrush	VIC, SA	
Callistemon salignus	Willow Bottlebrush		
E. alpina spp. agg.	Grampians Gum		
Eucalyptus caesia	Caesia Gum (Silver Princess)	WA	
Eucalyptus crenulata	Buxton Gum	VIC	
Eucalyptus globulus subsp. globulus	Southern Blue-gum	TAS	
Eucalyptus leucoxylon rosea	Red-flowered Yellow Gum	NSW, SA & VIC	
Eucalyptus pauciflora	Snow Gum		
Eucalyptus sideroxylon	Mugga		
E. spathulata subsp. spathulata	Swamp Mallet		

Revised Botanical Name (VBA 2015)	Revised Common Name (VBA 2015)	Origin	Notes
Eucalyptus tricarpa subsp. tricarpa	Red Ironbark		
Eucalyptus viminalis	Manna Gum		
Grevillea rosmarinifolia	Rosemary Grevillea	VIC, NSW	
Hakea salicifolia	Willow-leaf Hakea	NSW & QLD	
H. sericea s.l.	Bushy Needlewood	VIC, NSW, TAS	
H. drupacea	Sweet Hakea	WA	
Kunzea ericoides spp. agg.	Burgan		
M. armillaris subsp. armillaris	Giant Honey-myrtle	NSW, QLD, VIC & TAS	
Melaleuca decussata	Totem Poles	VIC, SA	
Melaleuca ericifolia	Swamp Paperbark		
Melaleuca hypericifolia	Hillock Bush	NSW	
Melaleuca liniarifolia	Flax-leaf Paperbark		
Melaleuca parvistaminea	Rough-barked Honey-myrtle		
Melaleuca squarrosa	Scented Paperbark		
Melaleuca stypheloides	Prickly Paperbark		

Appendix 4. Black Hill Fauna Species List

The fauna list below is a compilation of the known fauna species lists for Black Hill Reserve. The references and data used to compile the fauna species list are outlined below:

1) Bird census data and incidental observations; Practical Ecology Pty Ltd (15/12/2015 and incidental observation throughout survey period))
2) Incidental fauna survey by Karl Just (16/11/2015)
3) The current nestbox and camera trap monitoring being undertaken by the MRSC (regular surveys throughout 2015, since the January bushfire)
4) Information available on the Black Hill website (https://sites.google.com/site/blackhillreservekyneton/fauna)
5) Information available in A Walk Through Black Hill Reserve (Prictor, 1987)

The fauna species table below indicate the species observed during a variety of fauna surveys. This list is not exhaustive. If a species is not listed, this does not mean it does not occur, or that it no longer occurs within the reserve, if it was recorded in a previous survey, but not in the more recent survey.

Key to Species List

* Introduced animals

The key to the threatened species **status** is provided at the bottom of the fauna results table.

Origin	Common name	Scientific name	Status			Surveys			
			DELWP	FFG	EPBC	Karl Just 2015	MRSC 2015/16	FG Website	Prictor 1987
		Birds							
	Australian Magpie	*Cracticus tibicen*				X	X		X
	Australian Owlet-nightjar	*Aegotheles cristatus*					X		
	Australian Raven	*Corvus coronoides*							X
	Australian Wood Duck	*Chenonetta jubata*							X
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X			X
	Brown Falcon	*Falco berigora*							
	Brown Goshawk	*Accipiter fasciatus*				X			X
	Brown Thornbill	*Acanthiza pusilla*				X			
	Brown-headed Honeyeater	*Melithreptus brevirostris*				X			
	Brown Treecreeper	*Climacteris picumnus victoriae*	nt				X		X
	Buff-rumped Thornbill	*Acanthiza reguloides*				X			
*	Common Blackbird	*Turdus merula*				X			
	Common Bronzewing	*Phaps chalcoptera*							X
	Common Wombat	*Vombatus Ursinus*					X		
	Crested Pigeon	*Ocyphaps lophotes*							
	Crested Shrike-tit (Eastern)	*Falcunculus frontatus*							X
	Crimson Rosella	*Platycercus elegans*				X	X		X
	Dusky Woodswallow	*Artamus cyanopterus*							X
	Eastern Spinebill	*Acanthorhynchus tenuirostris*							X
	Eastern Yellow Robin	*Eopsaltria australis*					X		X
	Eastern Rosella	*Platycercus eximius*					X		X
*	European Goldfinch	*Carduelis carduelis*							X
	Flame Robin	*Petroica phoenicea*				X			X
	Galah	*Eolophus roseicapilla*							X
	Grey Currawong	*Strepera versicolor*							X

Origin	Common name	Scientific name	Status			Surveys			
			DELWP	FFG	EPBC	Karl Just 2015	MRSC 2015/16	FG Website	Prictor 1987
	Grey Fantail	*Rhipidura albiscapa*				X			X
	Grey Shrike-thrush	*Colluricincla harmonica*				X	X		X
	Jacky Winter	*Microeca fascinans*							X
	Laughing Kookaburra	*Dacelo novaeguineae*				X			X
	Leaden Flycatcher	*Myiagra rubecula*				X			
	Little Corella	*Cacatua sanguinea*							
	Little Lorikeet	*Glossopsitta pusilla*							X
	Little Pied Cormorant	*Microcarbo melanoleucos*							X
	Little Raven	*Corvus mellori*				X			
	Little Wattlebird	*Anthochaera chrysoptera*							X
	Long-billed Corella	*Cacatua tenuirostris*				X			
	Magpie-lark	*Grallina cyanoleuca*				X			X
	Masked Lapwing	*Vanellus miles*							X
	Mistletoebird	*Dicaeum hirundinaceum*				X			X
	Musk Lorikeet	*Glossopsitta concinna*				X			
	Pied Currawong	*Strepera graculina*				X			
	Powerful Owl	*Ninox strenua*	vu	L			X		
	Rainbow Bee-eater	*Merops ornatus*			M				X
	Red-browed Finch	*Neochmia temporalis*							X
	Red Wattlebird	*Anthochaera carunculata*				X			X
	Restless Flycatcher	*Myiagra inquieta*							X
	Rose Robin	*Petroica rosea*							X
	Rufous Whistler	*Pachycephala rufiventris*				X			X
	Painted Button-quail	*Turnix varia*							X
	Sacred Kingfisher	*Todiramphus sanctus*				X			
	Scarlet Robin	*Petroica boodang*							X
	Shining Bronze-Cuckoo	*Chrysococcyx lucidus*				X			
	Silver-eye	*Zosterops lateralis*							X
	Southern Boobook	*Ninox novaeseelandiae*							X
	Spotted Pardalote	*Pardalotus punctatus*				X			X
	Straw-necked Ibis	*Threskiornis spinicollis*							X
	Striated Pardalote	*Pardalotus striatus*				X			X
	Striated Thornbill	*Acanthiza lineata*				X			X
	Sulphur-crested Cockatoo	*Cacatua galerita*							X
	Superb Fairy-wren	*Malurus cyaneus*				X			X
	Tawny Frogmouth	*Podargus strigoides*							X
	Wedge-tailed Eagle	*Aquila audax*					X		
	Welcome Swallow	*Hirundo neoxena*							X
	Whistling Kite	*Haliastur sphenurus*							X
	White-eared Honeyeater	*Lichenostomus leucotis*				X			X
	White-faced Heron	*Egretta novaehollandiae*							X
	White-naped Honeyeater	*Melithreptus lunatus*							x
	White-plumed Honeyeater	*Lichenostomus penicillatus*							
	White-throated Treecreeper	*Cormobates leucophaea*				X			
	White-winged Chough	*Corcorax melanorhampos*				X	X		X
	Willie Wagtail	*Rhipidura leucophrys*							X
	Yellow-faced Honeyeater	*Lichenostomus chrysops*				X			X
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*							X
Mammals									
*	Black Rat	*Rattus rattus*					X		X

Origin	Common name	Scientific name	Status			Surveys			
			DELWP	FFG	EPBC	Karl Just 2015	MRSC 2015/16	FG Website	Prictor 1987
	Brush-tailed Phascogale	*Phascogale tapaotafa*	vu	L			X	X	X
	Common Brushtail Possum	*Trichosurus vulpecula*					X	X	X
	Common Ringtail Possum	*Pseudocheirus peregrinus*						X	X
	Common Wombat	*Vombatus ursinus*					X		
*	Domestic Dog (recorded remote camera at night)	*Canis lupus familiaris*					X		
	Eastern Grey Kangaroo	*Macropus giganteus*				X	X	X	X
*	European Hare	*Lepus europaeus*				X	X		
*	European Rabbit	*Oryctolagus cuniculus*				X	X	X	X
	Feather-tailed Glider	*Acrobates pygmaeus*					X		
*	Feral Cat	*Felis Catus*						X	X
*	Feral Pig	*Sus scrofa*					X		
*	House Mouse	*Mus musculus*					X		
	Koala	*Phascolarctos cinereus*					X	X	X
	Micro-bats	*(unidentified species)*					X		
*	Red Fox	*Vulpes vulpes*				X	X	X	X
	Short-beaked Echidna	*Tachyglossus aculeatus*				X		X	X
	Swamp Wallaby	*Wallabia bicolor*					X	X	X
	Sugar Glider	*Petaurus breviceps*					X	X	X
		Invertebrates							
*	Cabbage White	*Pieris rapae*							
	Common Brown	*Heteronympha merope*				X			
	Green Grass-dart	*Ocybadistes walkeri*				X			
	Meadow Argus	*Junonia villida*				X			
	Monarch	*Danaus plexippus*						X	
	Montane Ochre	*Trapezites phigalioides*				X			
	Spotted Jezebel	*Delias aganippe*				X			
	Wood Scorpion	*Cercophonius squama*					X		
		Reptiles							
	Blue-tongued Lizard	*Tiliqua spp.*					X		
	Common Garden Skink	*Lampropholis guichenoti*				X			
	Jacky Dragon	*Amphibolurus muricatus*				X	X		
	Red-bellied Black Snake	*Pseudechis porphyriacus*				X			
	Tiger Snake	*Notechis scutatus*					X		
	White-lipped Snake	*Drysdalia coronoides*					X		
		Amphibians							
	Eastern Banjo Frog (Pobblebonk)	*Limnodynastes dumerilii*					X		
	Common Eastern Froglet	*Crinia signifera*				X	X		
	Spotted Marsh-frog	*Limnodynastes tasmaniensis*				X	X		
	Southern Brown Tree-frog	*Litoria ewingii*					X		
		Fish							
*	Redfin Perch	*Perca fluviatilis*					X		

Conservation status of Threatened Fauna in Victoria:
(DELWP, ref. DEPI 2013)

ex: Extinct, **rx:** Regionally Extinct, **wx:** Extinct in the Wild, **cr:** Critically Endangered, **en:** Endangered, **vu:** Vulnerable, **nt:** Near Threatened, **dd:** Data Deficient

Definitions of Conservation Status Codes can be found on the DELWP website under Advisory List of Rare or Threatened Fauna

Conservation status under EPBC Act 1999:

EX: Extinct, **CR**: Critically endangered, **EN**: Endangered, **VU**: Vulnerable and **CD**: Conservation dependant **M**: Migratory Species listed under the Act (TREATY: JAMBA - Japan-Australia Migratory Bird Agreement)

Conservation status under FFG Act 1988: L: Listed, **N**: Nominated, **I**: Invalid or ineligible and **D**: Delisted

Appendix 5. Threatened Flora Species- 5km Radius Database Records

EPBC	FFG	VROT	Scientific name	Common name	Habitat/species notes	Last record within 5km of site	No. recs	Likelihood occurrence	Likelihood Reasoning
		r	*#Acacia howittii*	Sticky Wattle	Indigenous to the Tarra Valley and surrounds, central Gippsland, Victoria. It is also widely cultivated. Prefers moist forests and sheltered areas	2012	1	Nil	Outside of natural range
		r	*Bossiaea heterophylla*	Variable Bossiaea	An upright shrub up to 80 cm tall. It occurs from Wilsons Promontory in Victoria up through the coast and tablelands through New South Wales and further to Queensland.	2012	1	Nil	Outside of natural range
	L	v	*Caladenia clavescens*	Castlemaine Spider-orchid	Endemic to central Victoria where known only from the Campbells Creek, Castlemaine, Chewton region in box-ironbark forest on skeletal or stony brown loam	1997	1	Nil	Outside of natural range
		r	*Deschampsia caespitosa*	Tufted Hair-grass	It can be found on all types of grassland, although it prefers poorly drained soil.	1997	1	Low	Unsuitable habitat
EN	L	en	*Dianella amoena*	Matted Flax-lily	This plant is known to occur in lowland grasslands, grassy woodlands and grassy wetlands. It ranges from well drained to seasonally wet soils	2011	2	Low	Unsuitable habitat
	L	r	*Discaria pubescens*	Australian Anchor Plant	Ridged, spiny, almost leafless shrub, Mostly on rocky slopes near streams particularly on basalt. Rare due to clearing for stock	1997	1	Low	Unsuitable habitat
		r	*Geranium sp. 3*	Pale-flower Crane's-bill	Open, grassy areas of dry woodland to forest, northern outskirts of Melbourne (Eltham, Yan Yean), and in central western Victoria (Stawell)	2011	1	High	Recorded in the reserve
V	L	v	*Glycine latrobeana*	Clover Glycine	Widespread, infrequent populations in southern Victoria. It occurs mainly in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. In Victoria, plants grow in a range of soil types including alluvial soils, and those derived from sandstones, mudstones, granite and basalt. Soils are usually clay, but may also have high loam content	2005	2	High	Recorded in the reserve
		en	*Pterostylis agrestis*	Sutton Grange Greenhood	Endemic to Victoria where confined to basalt plains grasslands in the vicinity of Bacchus Marsh, Maldon, Sutton Grange, Taradale and possibly Woorndoo. Flowers Sep.-Oct.	2011	1	Nil	Outside of natural range

Appendix 6. Threatened Fauna Species- 5km Radius Database Records

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Habitat/species notes	Last record within 5km of site	No. recs.	Likelihood occurrence	Likelihood Reasoning
		L	v	*Accipiter novaehollandiae novaehollandiae*	Grey Goshawk	The Grey Goshawk has a stronghold in Victoria, particularly the white form, in the Otway Ranges, where wet forests and gullies containing Mountain Grey Gum adjoin partly cleared farmlands. They occur in lower densities in similar habitats in the Strzelecki Ranges, Gippsland Plains and Otway Plains. Elsewhere in the State they are occasionally seen in woodlands, dry forests, suburban parks and wooded farmlands	2001	1	Low	Unsuitable habitat
		L	v	*Chthonicola sagittatus*	Speckled Warbler	Mainly grassy ground layer of dry sclerophyll forests and woodlands, often with scattered shrubs in under-storey, mainly forests dominated by eucalyptus, especially box-ironbark forests and woodlands e.g. near Chiltern, ne E Victoria, Near Bendigo recorded in red Stringybark, red box and long leaved box with a grassy ground layer and well-spaced shrubs in understorey, but not in red ironbark or yellow gum forests.	1976	1	Low-moderate	Mostly unsuitable habitat
			nt	*Climacteris picumnus victoriae*	Brown Treecreeper (south-eastern ssp.)	Occurs in eucalypt woodlands, particularly open woodland lacking a dense understorey. It is sedentary and nests in tree hollows within permanent territories, breeding in pairs or communally in small groups. Birds forage on tree trunks and on the ground amongst leaf litter and on fallen logs for ants, beetles and larvae	1975	1	High	Recorded within the site
	V	L	v	*Grantiella picta*	Painted Honeyeater	It is a summer migrants to Victoria. They are generally found to inhabit box-ironbark, Broad-leaved Peppermint and Red Stringybark forests and box-buloke woodlands in the northern foothills of the great Divide. May also occur in Red Ironbark, Red Box forests in southern Victoria. They are occasionally found along Murray River valley to Hattah-Kulkyne NP where they inhabit Black Box woodlands. This species is usually found in open stands of old eucalypts that are infested with mistletoes	2001	2	Low	Mostly unsuitable habitat
CAMBA, ROKAMBA ,JAMBA			v	*Hirundapus caudacutus*	White-throated Needletail	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable.	2008	1	Low	Unsuitable habitat

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Habitat/species notes	Last record within 5km of site	No. recs.	Likelihood occurrence	Likelihood Reasoning
	V	L	en	*Litoria raniformis*	Growling Grass Frog	The species often inhabits water bodies with a diverse assemblage of aquatic vegetation, including emergent species such as sedges (Gahnia spp.), submergent species such as curly pondweed (Potamogeton spp.), floating species such as water ribbon (Triglochin spp.) and filamentous algae. The aquatic vegetation provides sites for male frogs to call from, sites for eggs to be deposited and relatively safe development, and food and shelter for tadpoles. Dense submergent vegetation is especially important to protect eggs and tadpoles from predation.	?	1	Low-moderate	Mostly unsuitable habitat
		L	v	*Phascogale tapoatafa*	Brush-tailed Phascogale	Species typically inhabits dry forest and woodland dominated by box, ironbark and stringybark eucalypts but may also occur in wetter forests. Prefers open forest with sparse groundcover, but uses habitats ranging from Mallee to rainforest. The understorey and ground cover in these favoured habitats may be sparse, consisting of "scattered tussocks and forest litter". Other characteristics of known habitat of this species include dead trees (favoured for foraging), availability of bark from the Red Stringybark (for nest material), and a number of tree hollows with entrances as narrow as 5cm or less (for nesting and shelter). Has disappeared from substantial areas of Victoria in recent times.	2010	11	High	Recorded within the site
JAMBA				*Merops ornatus*	Rainbow Bee-eater	The species occurs in many types of habitat including woodland, shrubland, semi-cleared land and farmland; however it mainly occurs where eucalyptus species are dominant. It is almost entirely insectivorous and mostly occurs near to permanent water.	2015	1	Moderate	Suitable habitat within site
		L	v	*Ninox strenua*	Powerful Owl	Widespread in foothill and coastal forests where they especially favour gullies with peppermint-Manna Gum forests. Occasionally seen in wetter mountain forests, drier box-ironbark forests and woodlands, and softwood plantations. Hunts at night by flying through the forest canopy catching prey from tree branches. They nest in large holes in trees.	2015	1	Moderate	Suitable habitat within site
		L	en	*Pseudophryne bibronii*	Brown Toadlet	Frequent dry forest, woodland, shrubland and grassland; sheltering under leaf-litter and other debris in moist soaks and depressions. Eggs are spawned in shallow burrows (or nets) under litter, in low areas, near water, that will later be flooded. Tadpoles are aquatic in ponds, flooded grassland and roadside ditches.	2015	100+	Moderate	Suitable habitat within site

Appendix 7. Bird Census Data Black Hill Reserve

Survey Details							Year (and 2-hectare, 20-minute bird census site #)				
							2015				
							Site 1	Site 2	Site 3	Site 4	Comments
Date							15/12/2015				Alice Ewing (Practical Ecologist - Zoologist) William Terry (Macedon Ranges Shire Council - Environmental Officer)
Time (start/finish)							1310-1330	1400-1420	1435-1455	1335-1355	
Observer(s)							AE, WT	AE, WT	AE, WT	AE, WT	
Temperature		°C									
Cloud Cover		%									
Wind Velocity		knots									
Wind Direction											
Precipitation		(description)					nil	nil	nil	nil	
Relative Humidity		%									
Common Name	Scientific Name	Status	Origin	DEPI	FFG	EPBC	Site 1	Site 2	Site 3	Incidental	Comments (all records are observations, unless described below)
BIRDS											
Striated Thornbill	*Acanthiza lineata*						X	X		X	
Brown Thornbill	*Acanthiza pusilla*						X				
Red Wattlebird	*Anthochaera carunculata*							X			
Sulphur-crested Cockatoo	*Cacatua galerita*									X	
Grey Shrike-thrush	*Colluricincla harmonica*							X			
Little Raven	*Corvus* sp.								X		
Australian Magpie	*Cracticus tibicen*						X	X	X	X	
Brown Falcon	*Falco berigora*								X		
Yellow-faced Honeyeater	*Lichenostomus chrysops*						X	X			
White-eared Honeyeater	*Lichenostomus leucotis*							X			
White-plumed Honeyeater	*Lichenostomus penicillatus*						X				
Superb Fairy-wren	*Malurus cyaneus*								X	X	
Crested Pigeon	*Ocyphaps lophotes*									X	
Spotted Pardalote	*Pardalotus punctatus*							X			
Common Bronzewing	*Phaps chalcoptera*									X	
Crimson Rosella	*Platycercus eximius*						X	X		X	
Tawny Frogmouth	*Podargus strigoides*						X				
Grey Currawong	*Strepera versicolor*								X		
MAMMALS											
Eastern Grey Kangaroo	*Macropus giganteus*						X			X	
European Rabbit	*Oryctolagus cuninculus*	*								X	
Sugar Glider							X				nest - visible through gaps of tree hollow (relatively fresh leaves)
INVERTEBRATES											
Cabbage White	*Pieris rapae*										
Common Brown	*Heteronympha merope*						X				

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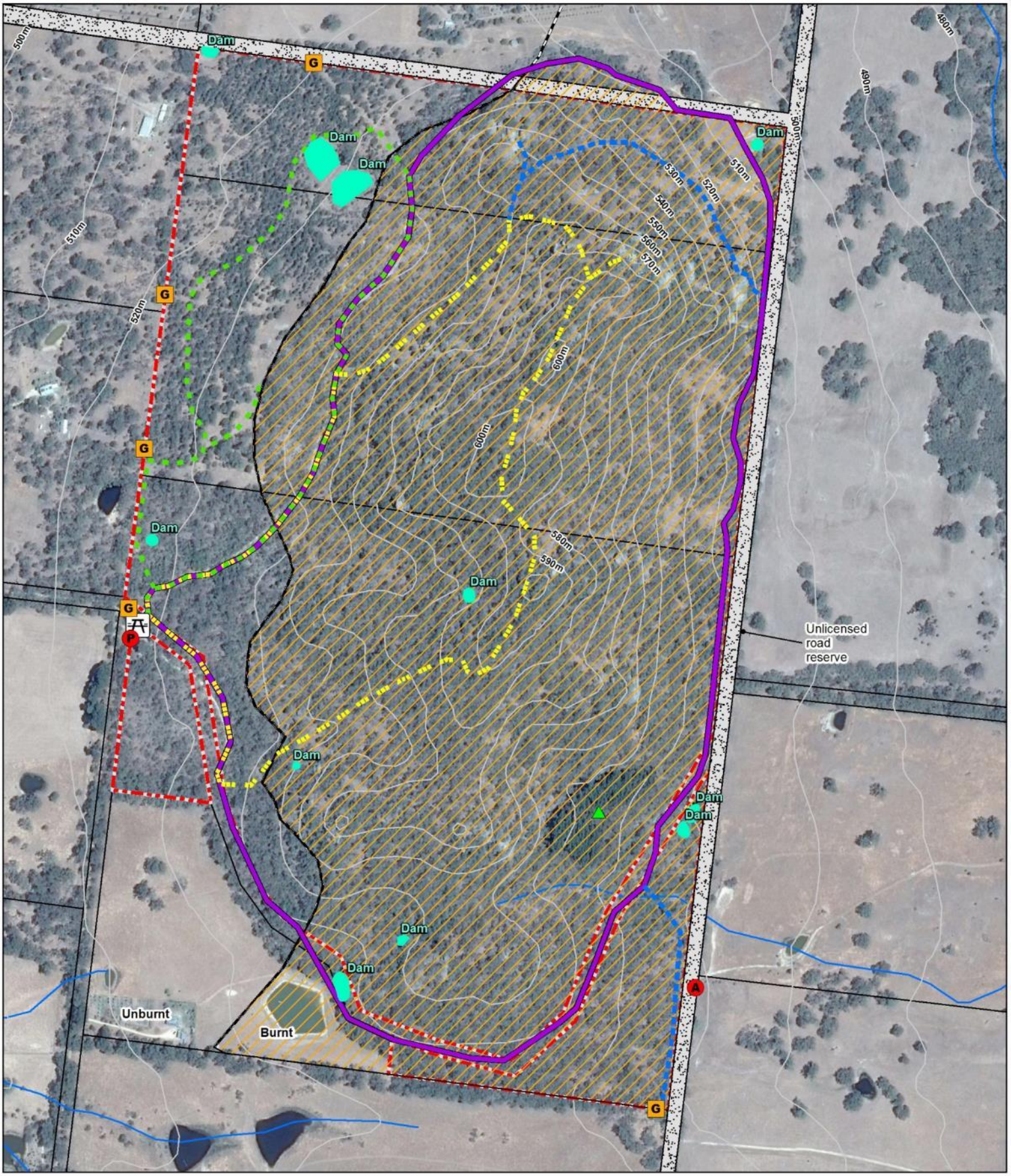

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Legend

- Black Hill Reserve
- Parcels
- Fire Boundary
- Alternate entrance with limited parking
- Car parking and main entrance
- Gates
- Picnic facilities
- Pine plantation
- Watercourse
- Contours (10m)
- Dams
- Unlicensed road reserve

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 17/11/2016

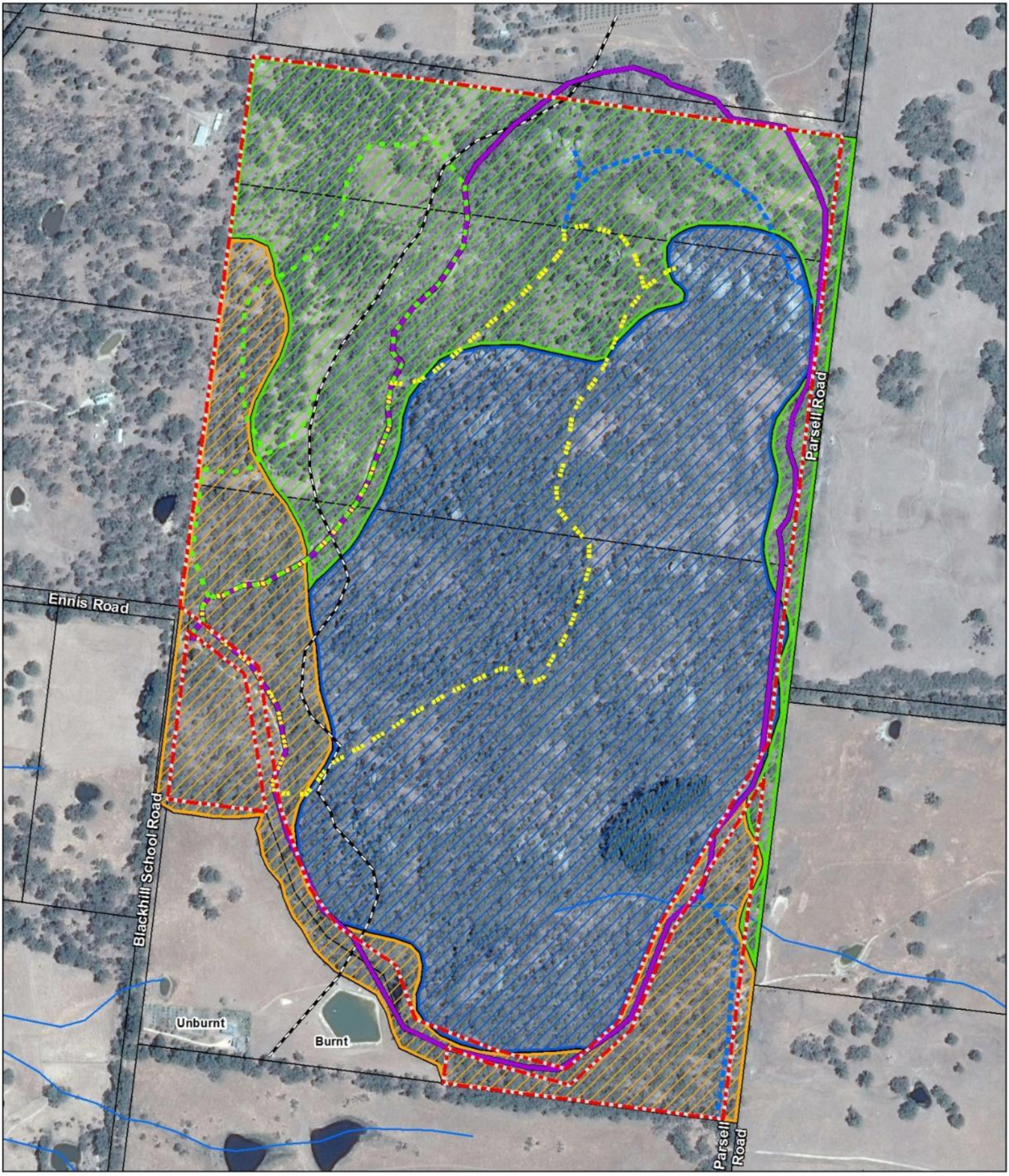
Map 2. Site Description

Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Ecological Vegetation Class

- EVC 47: Valley Grassy Forest
- EVC 175_62: Granitic Grassy Woodland
- EVC 72: Granitic Hills Woodland

Indicative EVCs only due to high level of previous disturbance and extent of revegetation across the reserve.

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 23/02/2016

Map 3. Ecological Vegetation Classes

Black Hill Reserve

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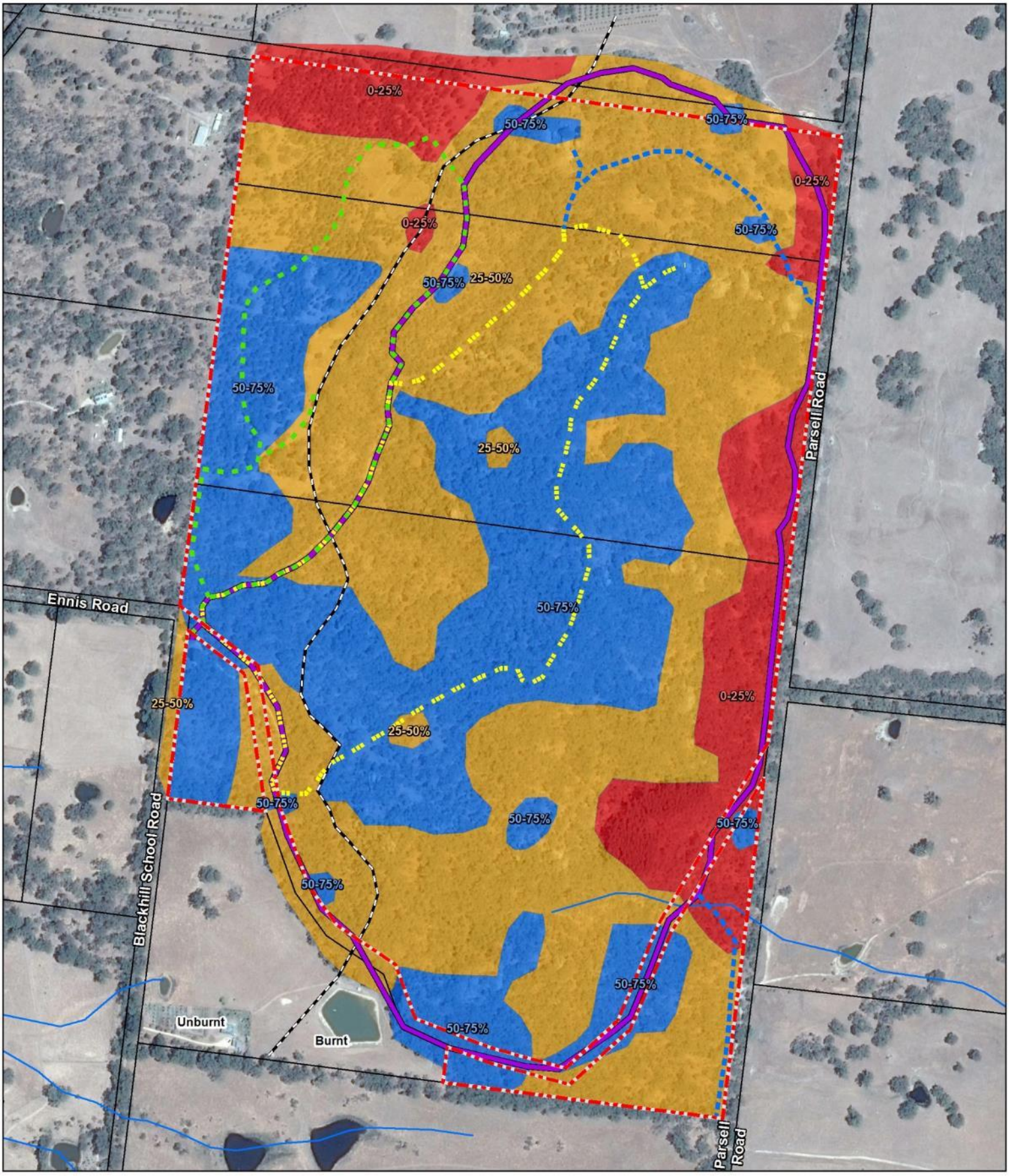
Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Indigenous Vegetation Groundstorey Cover

- 0-25%
- 25-50%
- 50-75%

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

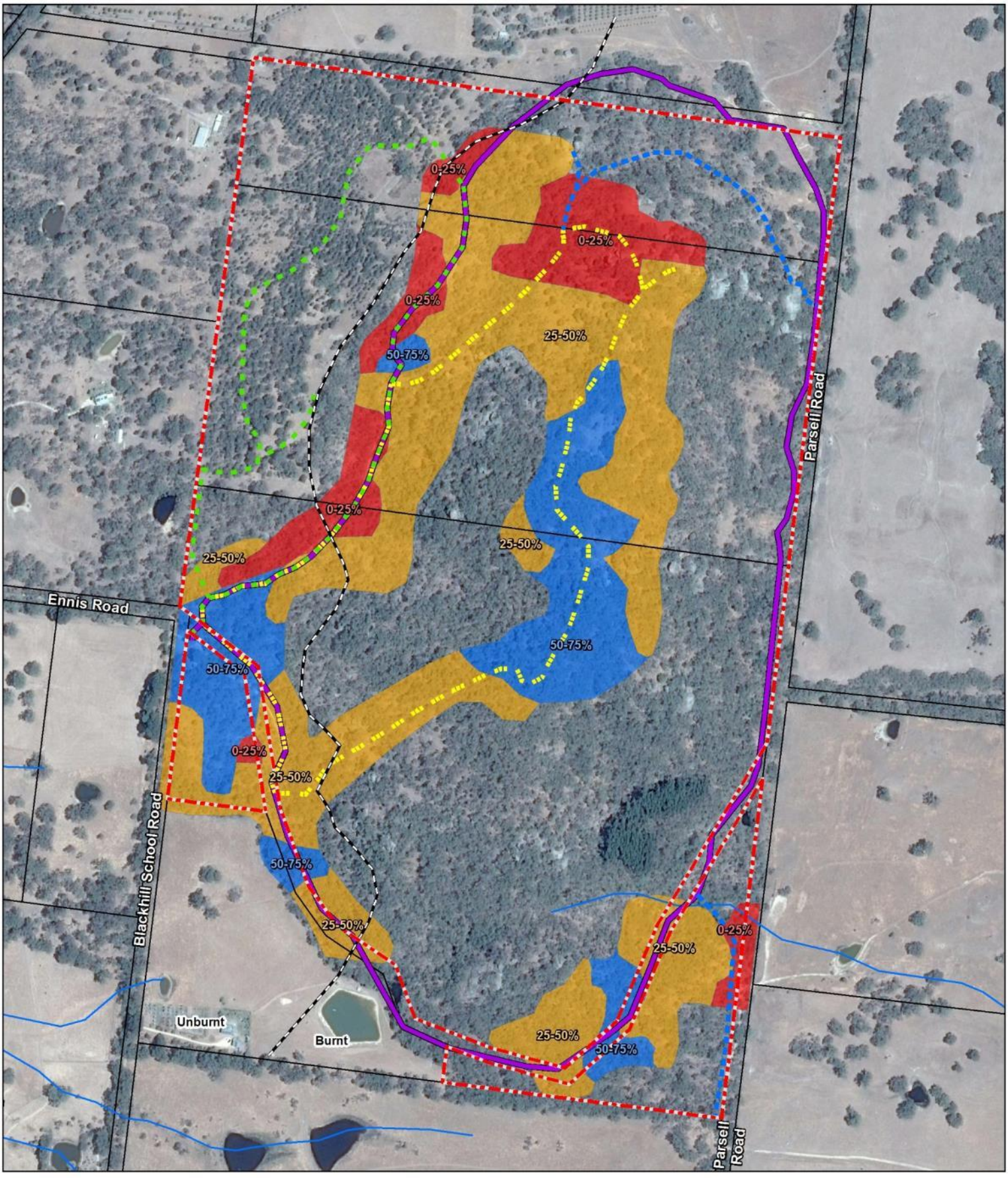
Date: 8/11/2016

Map 4a. Indigenous Groundstorey Quality 2015
Black Hill Reserve Kyneton

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Indigenous Vegetation Groundstorey Cover

- 0-25%
- 25-50%
- 50-75%

Details

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Date: 8/11/2016

Map 4b. Indigenous Groundstorey Quality 2016
Black Hill Reserve Kyneton

N

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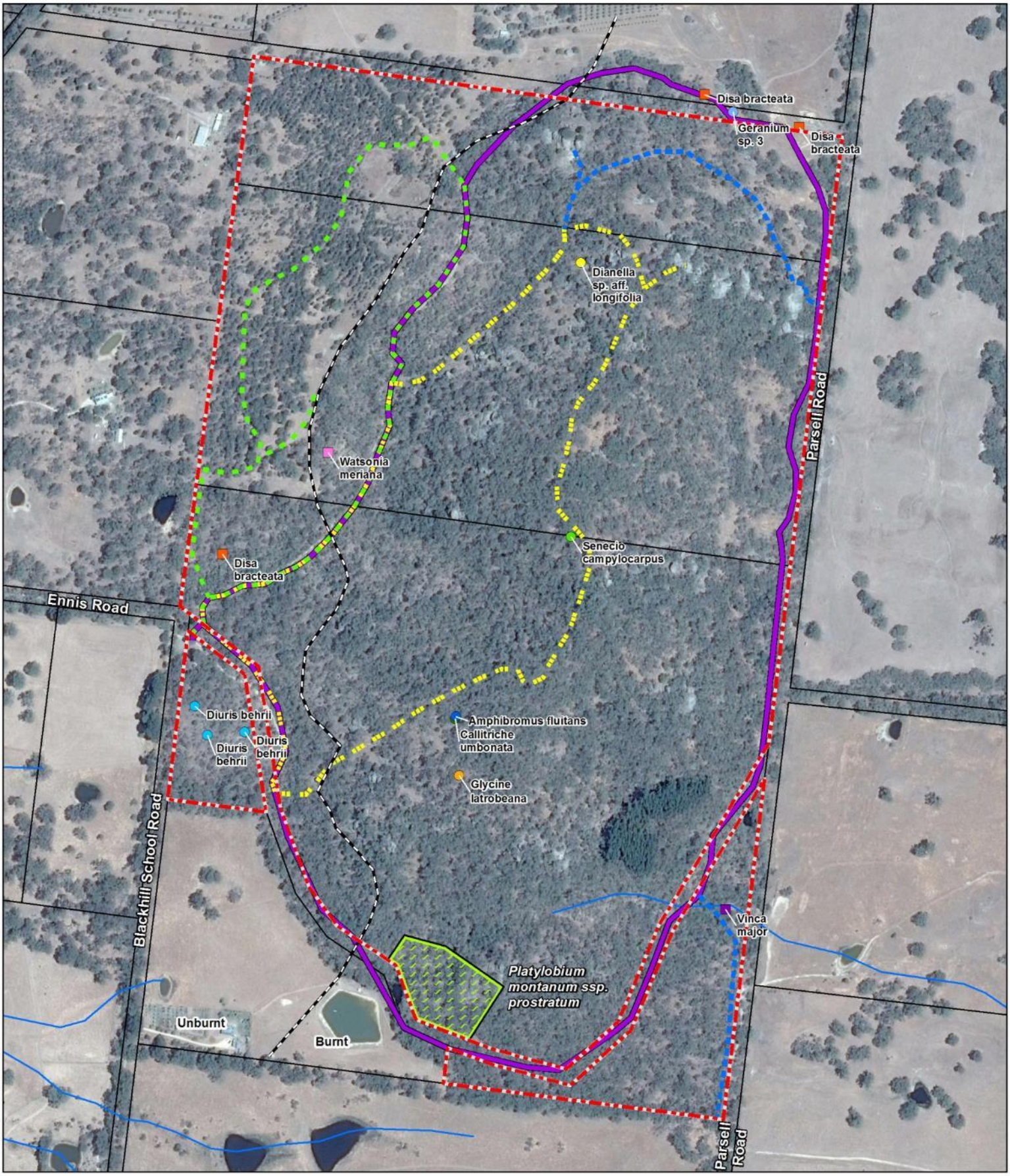
Scale 1:4,749 (Page size A3)



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Legend

Black Hill Reserve
Parcels
Watercourse
Fire Boundary

Tracks
Circuit track
Link track
Revegetated area track
Ridge track

Flora records
Threatened species
Amphibromus fluitans
Callitriche umbonata
Dianella sp. aff. longifolia
Diuris behrii
Geranium sp. 3
Glycine latrobeana
Senecio campylocarpus
Platylobium montanum ssp. prostratum

Weeds
**Disa bracteata*
**Watsonia meriana*
**Vinca major*

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 15/11/2016

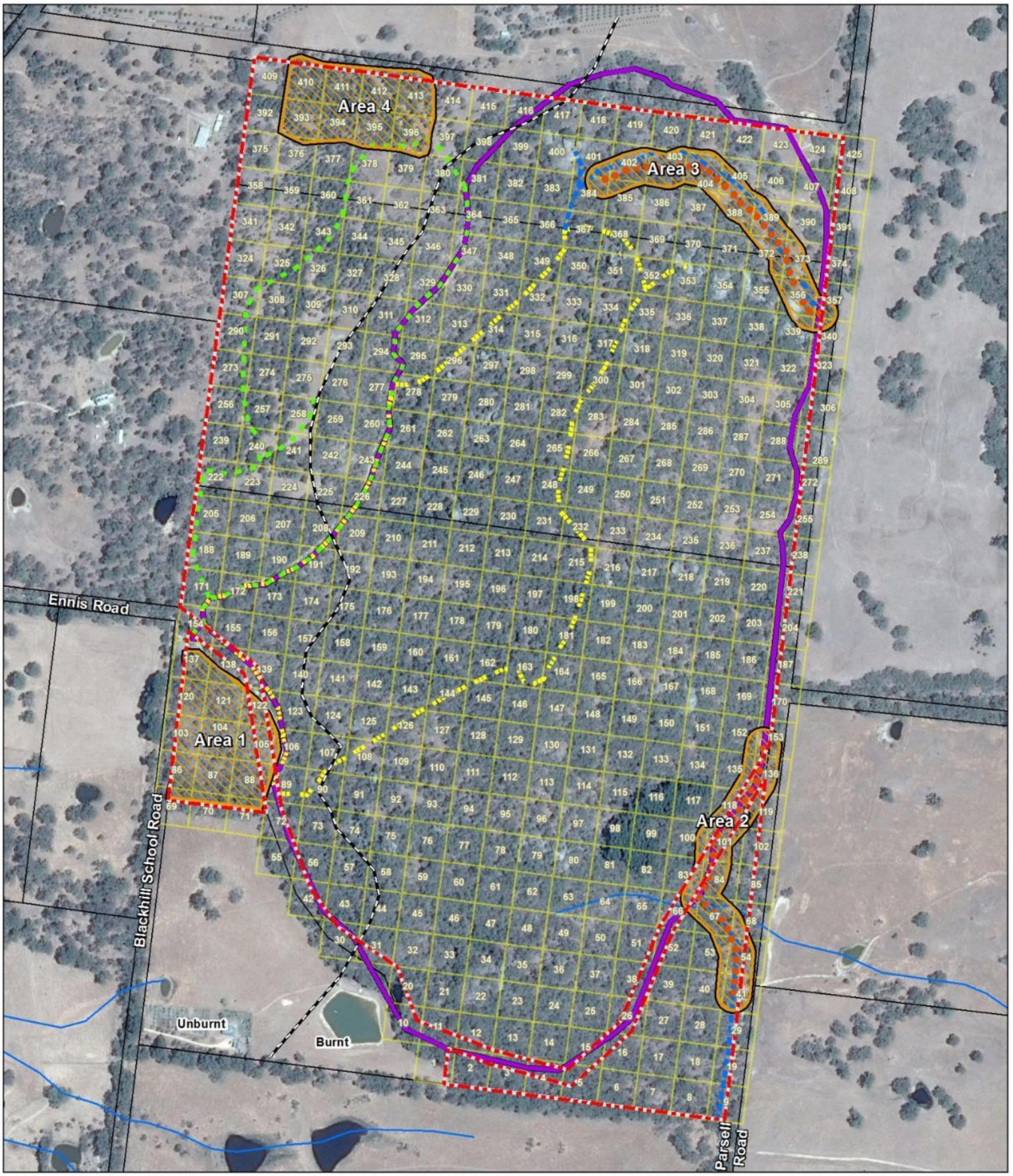
Map 5. Flora Locations – Threatened Species and Weed Records

Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary
- 50m grid
- Bird survey areas
- Bird survey tracks

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 23/02/2016

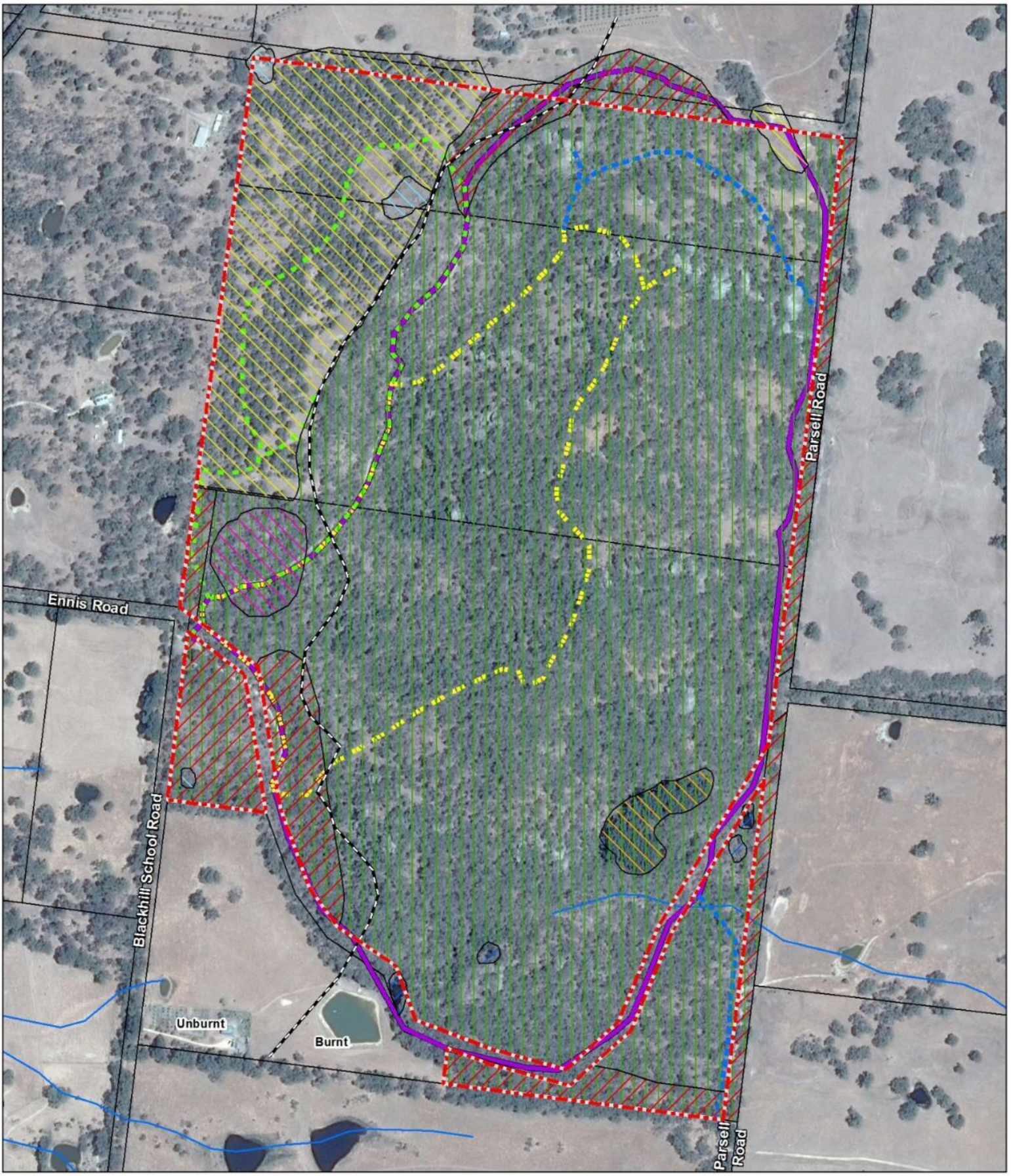
Map 6. Bird Census

Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Tracks

- Circuit track
- Link track
- Revegetated area track
- Ridge track

Fauna habitat

- Remnant vegetation and older native plantings
- Younger revegetation
- Hollow trees
- Melaleuca thicket
- Pines
- Ephemeral wetland
- Permanent wetland

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 23/02/2016

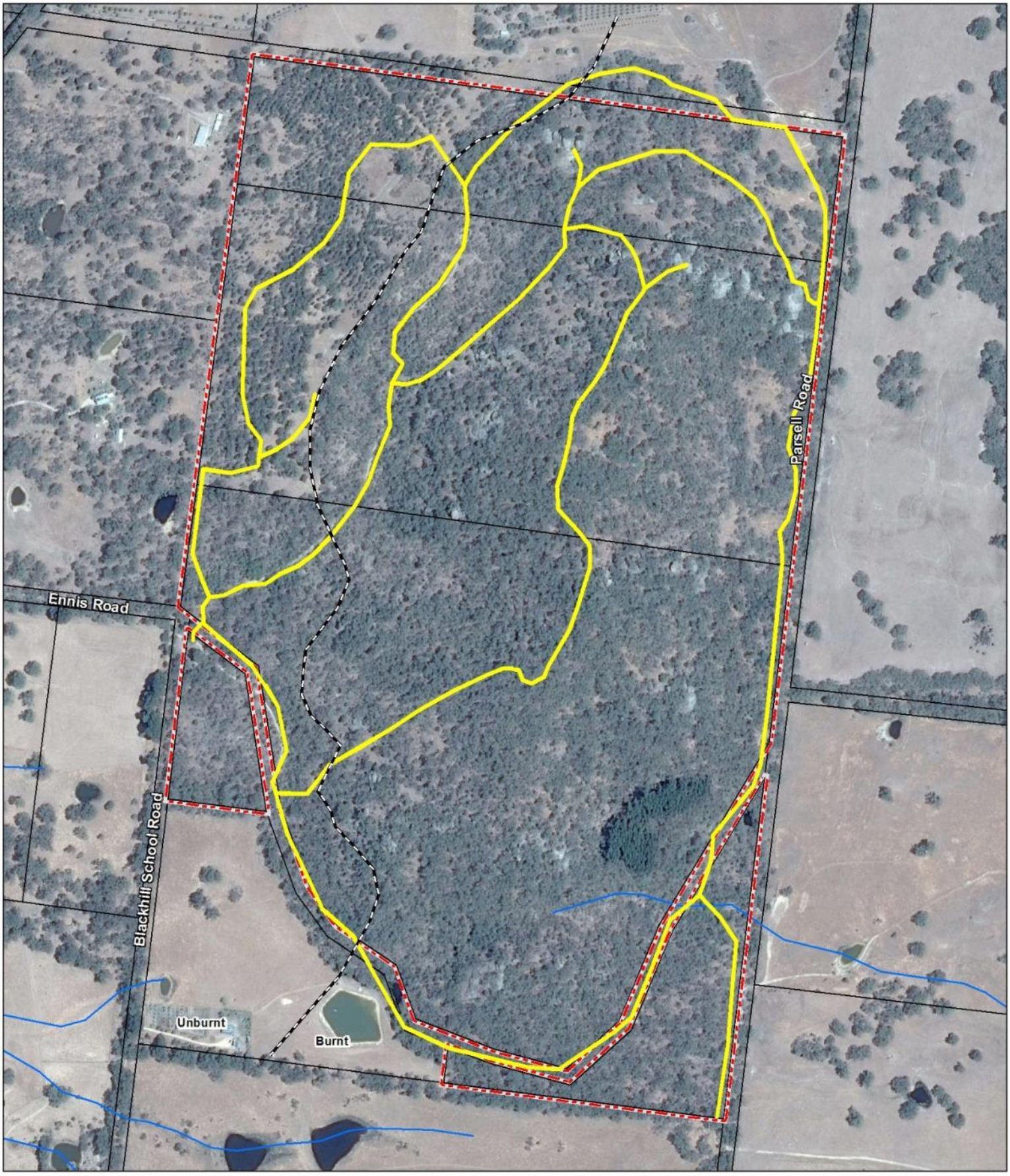
Map 7. Fauna Habitat Assessment

Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Management Zones

- Track Management Zone

Details

Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria. Aerial photography from Google Earth Pro

Date: 22/07/2016

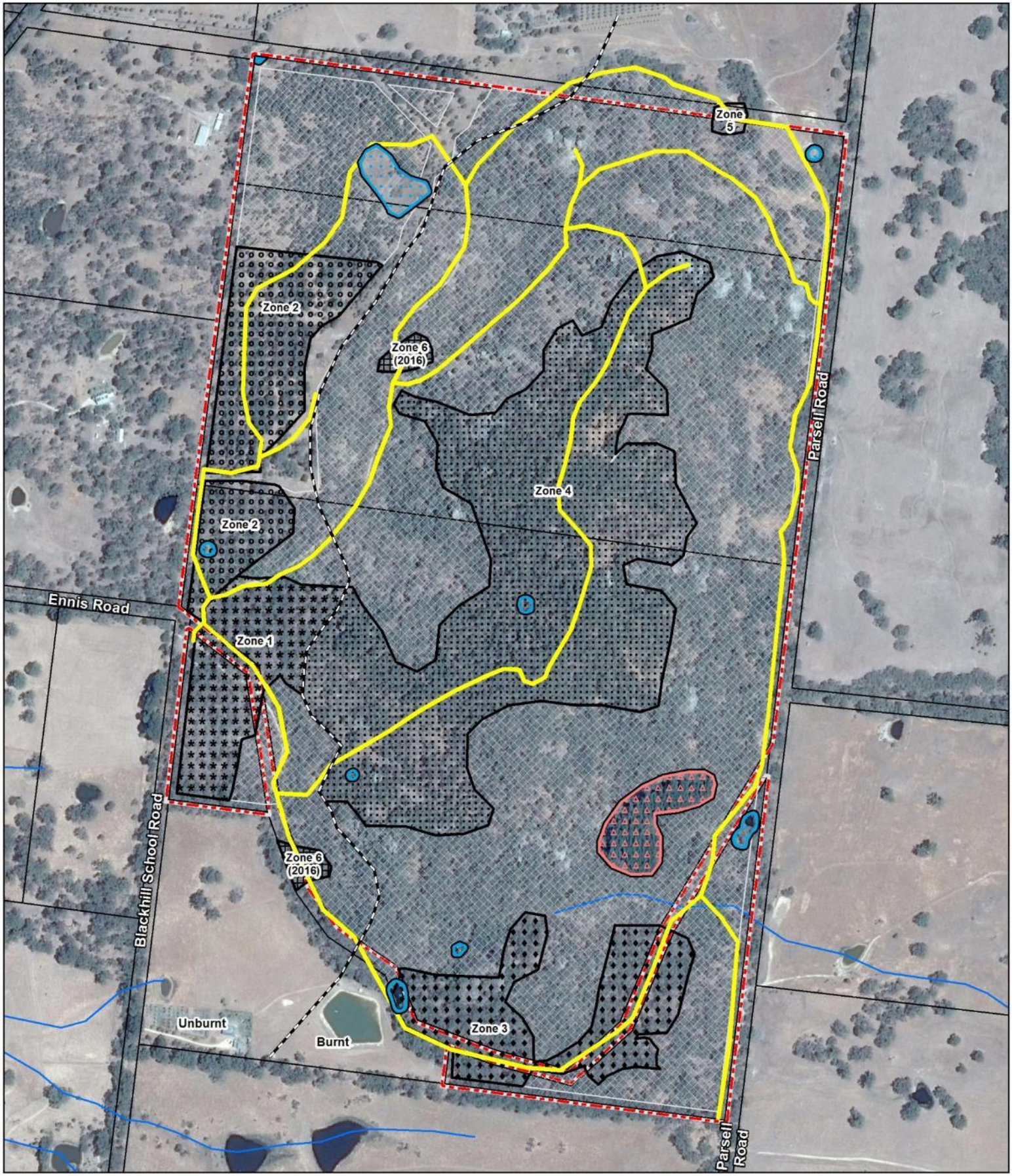
Map 8. Fire Risk Management

Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)



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Legend

- Black Hill Reserve
- Parcels
- Watercourse
- Fire Boundary

Management Zones

- Dam Zone
- Track Management Zone
- Pine Plantation
- Lower Quality Bushland Zone

Higher Quality Bushland Zone

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6 (2016)

Details

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Date: 23/11/2016

Map 9. Management Zones
Black Hill Reserve

N

0 50 100 150 200 m

Scale 1:4,750 (Page size A3)