

Brown Mountain Reserve

Management Plan 2016 - 2021



Tasmanian Land Conservancy (2016). Brown Mountain Reserve Management Plan 2016 – 2021. Tasmanian Land Conservancy, Lower Sandy Bay Tasmania Australia 7005.

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Front Image: Brown Mountain Reserve - Denna Kingdom TLC

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ADAPTIVE MANAGEMENT FRAMEWORK

The TLC aims to demonstrate excellence in management for biodiversity conservation and has adopted the *Open Standards for the Practice of Conservation*, which is an international system of adaptive management developed by the Conservation Measures Partnership (<http://www.conservationmeasures.org>). The *Open Standards* provides a guide to planning and implementing conservation actions and incorporates a model of adaptive management (Figure 1).

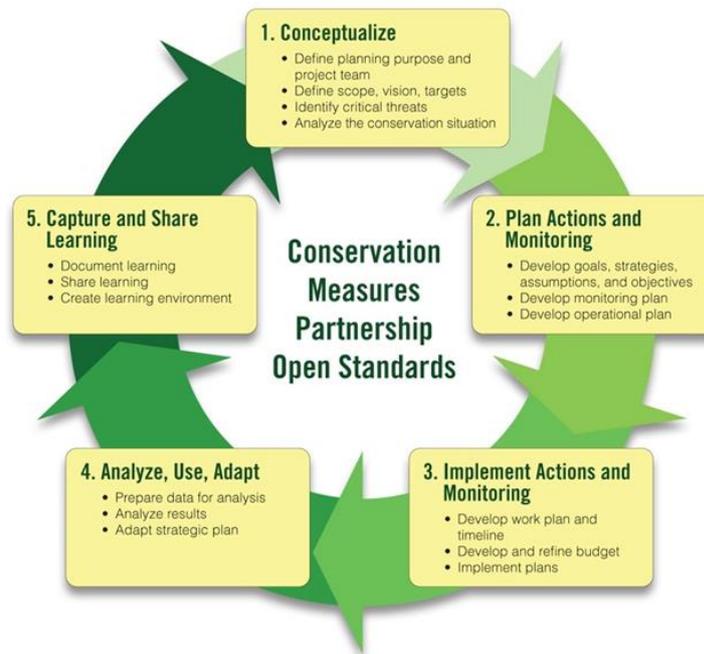


Figure 1 *Open Standards adaptive management model, developed by the Conservation Measures Partnership.*

Conservation Action Planning

This management plan represents the outcomes of the Open Standards adaptive management model. Conservation targets have been selected that describe broad ecosystem classes or habitat types. Ecological indicators are selected for each target and used to monitor changes in their condition. Threats to each of the targets are then identified, along with the factors that contribute to the threats, and these are prioritised depending on the extent, likelihood and severity of the impact of these threats to the conservation targets. Strategies to manage these threats are developed, with consideration given to the environmental, social and economic feasibility of each strategy. As TLC manages land over time, information is analysed and the results used to adapt management strategies to ensure that the goals and objectives are being progressed.

Implementation of Management Strategies

Strategies to mitigate the threats to conservation targets are assessed for their feasibility and prioritised according to the likelihood and extent of mitigating the threat, the resources required and the resources available to implement the strategy.

Five-year work plans are developed to implement the management strategies and to record the specific activities to be undertaken, their timing and the resources required. Work plans also allocate budgets, allowing the TLC to plan ahead to ensure appropriate capacity to deliver reserve management activities.

Ecological parameters are also considered when scheduling works, to ensure that projects are undertaken when they are most likely to succeed. Progress against activities in the work plan is reviewed annually.

Monitoring and Evaluation

The TLC implements a monitoring and evaluation strategy across all of its permanent reserves. Monitoring of specific ecological indicators enables the collection of scientifically robust information on the status and trends of the conservation targets. Measuring the success of management actions is also critical for ensuring successful long-term management of the targets. Four types of monitoring conducted at intervals from 1 to 5 years:

- **Long-term ecological monitoring** establishes a baseline measure of ecological indicators and subsequently provides an early warning of deleterious changes in the conservation targets. The results of this monitoring allow reserve managers to develop mitigation measures and reduce future costs of remedial management.
- **Annual reserve assessments** are undertaken once per year by TLC reserve management staff across all permanent reserves to identify any new or emerging threats that have the potential to reduce the viability of the targets. Early identification of threats allows early management interventions to mitigate a threat.
- **Management effectiveness evaluation** provides land managers with information that is essential to determine the efficacy of management efforts. Data are collected on management inputs and biodiversity outputs, using indicators specific to measuring the success of each management strategy.
- **Change detection analysis** using remote sensing GIS data, is undertaken to assess the impact of management strategies on vegetation cover and changes in surrounding land cover that could indicate any 'leakage' – shifting of a threatening process from a reserve to surrounding areas. Where this is identified, the TLC works with neighbouring landholders to develop local or regional mitigation strategies.

Reporting and Adapting

The results obtained from monitoring are used to adapt and direct on-ground works and update annual work plans and reserve management plans. The status of conservation targets, trends in ecological indicators and outcomes of reserve management activities are communicated to the TLC Board and TLC's Science Council, stakeholders and the community through a range of regular communication channels including an annual report.

OVERVIEW

A background report on Brown Mountain Reserve providing information on acquisition and natural values is contained in a separate document (Tasmanian Land Conservancy 2016) available on the TLCs web.

VISION	Brown Mountain Reserve is managed for its wet forest ecosystem.
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CONSERVATION TARGET	GOAL
Wet forest ecosystem	Maintain or improve the 2016 condition of the forest.
SOCIAL TARGET	GOAL
Community connection to the landscape	Community are engaged with the Reserve and region.
STRATEGIES	OBJECTIVES
Improve knowledge of flora and fauna	By 2020 species of conservation significance which occupy or utilise the Reserve have been identified and their habitat is being managed effectively. By 2020 the impact of lyrebirds is better understood and an assessment can be made as to whether they pose a threat and require management.
Access management	Secure access and exclude known threats, including fire, wood/fern-cutting and weeds.
Invasive species management	Reduce or exclude invasive weeds. By 2020 the impact of Lyrebirds is better understood and an assessment can be made as to whether they pose a threat and require management.
Fire management	Exclude fire from the reserve
Community engagement	Regular visits are made to the Reserve by staff, partners and volunteers (at least once/year).
Annual reserve assessment	Exclude known threats, including fire, wood/fern-cutting and new invasive weeds. No new threats emerge from 2016.

INTRODUCTION

The Brown Mountain Reserve (the Reserve) is 86ha of land in two titles situated about 5km west of Ellendale in the Derwent Valley, close to the northern boundary of Mount Field National Park.

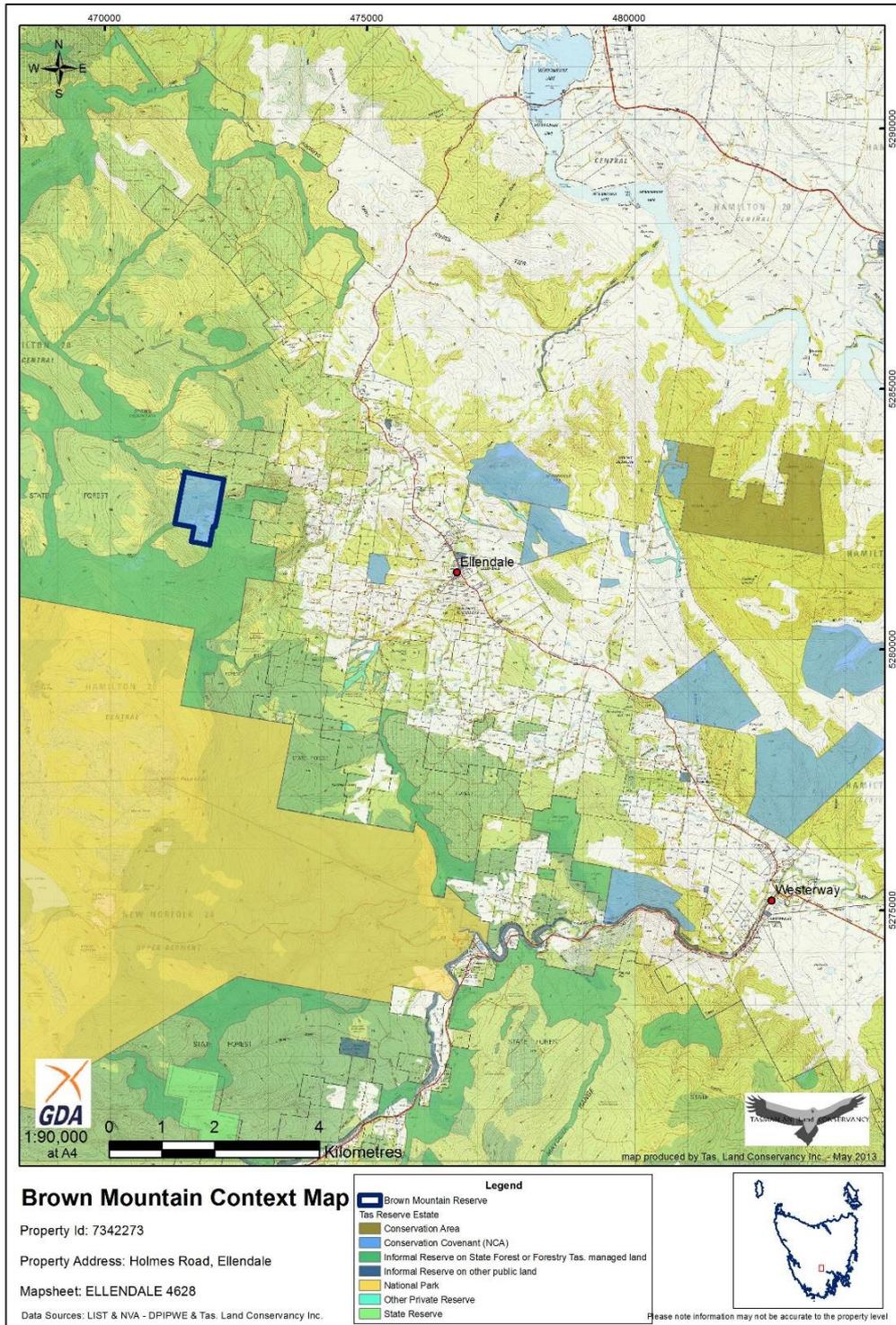


Figure 2 Location of Brown Mountain Reserve, Ellendale.

Tall, wet Eucalypt forest occupies the whole area of the Reserve and falls into three vegetation types under the TASVEG classification (see Table 1 and Figure 2).

Table 1 Vegetation communities mapped at the Reserve (TASVEG 3.0)

Vegetation community	TASVEG code	Approx. Area (ha)	Conservation status (NCA 2002)
<i>Eucalyptus obliqua</i> forest with broadleaf shrubs	WOB	4.4	Not threatened
<i>Eucalyptus delegatensis</i> with broadleaf shrubs	WDB	26.8	Not threatened
<i>Eucalyptus regnans</i> forest	WRE	56.2	Not threatened

The Reserve provides habitat for wide range of plant and animal species including threatened fauna and the old growth elements and watercourses provide a range of wet forest ecological niches (see (Tasmanian Land Conservancy 2016, Table 2 and Figure 2)

Table 2 Threatened species recorded at the Reserve or likely to occur

Species	Common name	Conservati on Status TSPA/EPB CA#	Status/significance on the Reserve
FLORA			None recorded and none likely
FAUNA			
<i>Aquila audax fleayi</i>	Tas. wedge-tailed eagle	e/EN	Nest record on the Reserve
<i>Accipiter novaehollandiae</i>	Grey Goshawk	e/-	Suitable habitat on the Reserve
<i>Dasyurus maculatus</i>	Spotted tailed quoll	r/VU	Suitable habitat on the Reserve
<i>Dasyurus viverrinus</i>	Eastern quoll	-/VU	Suitable habitat on the Reserve
<i>Sarcophilus harrisi</i>	Tasmanian Devil	e/EN	Suitable habitat on the Reserve
<i>Tyto novaehollandiae castanops</i>	Masked Owl	e/VU	Suitable habitat on the Reserve

listed on the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and/or the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBCA).

This management plan outlines the management strategies needed to protect the Reserve. The plan is supported by a comprehensive background document about the Reserve, its acquisition and its special values (Tasmanian Land Conservancy 2016), which is available on the TLC website www.tasland.org.au.

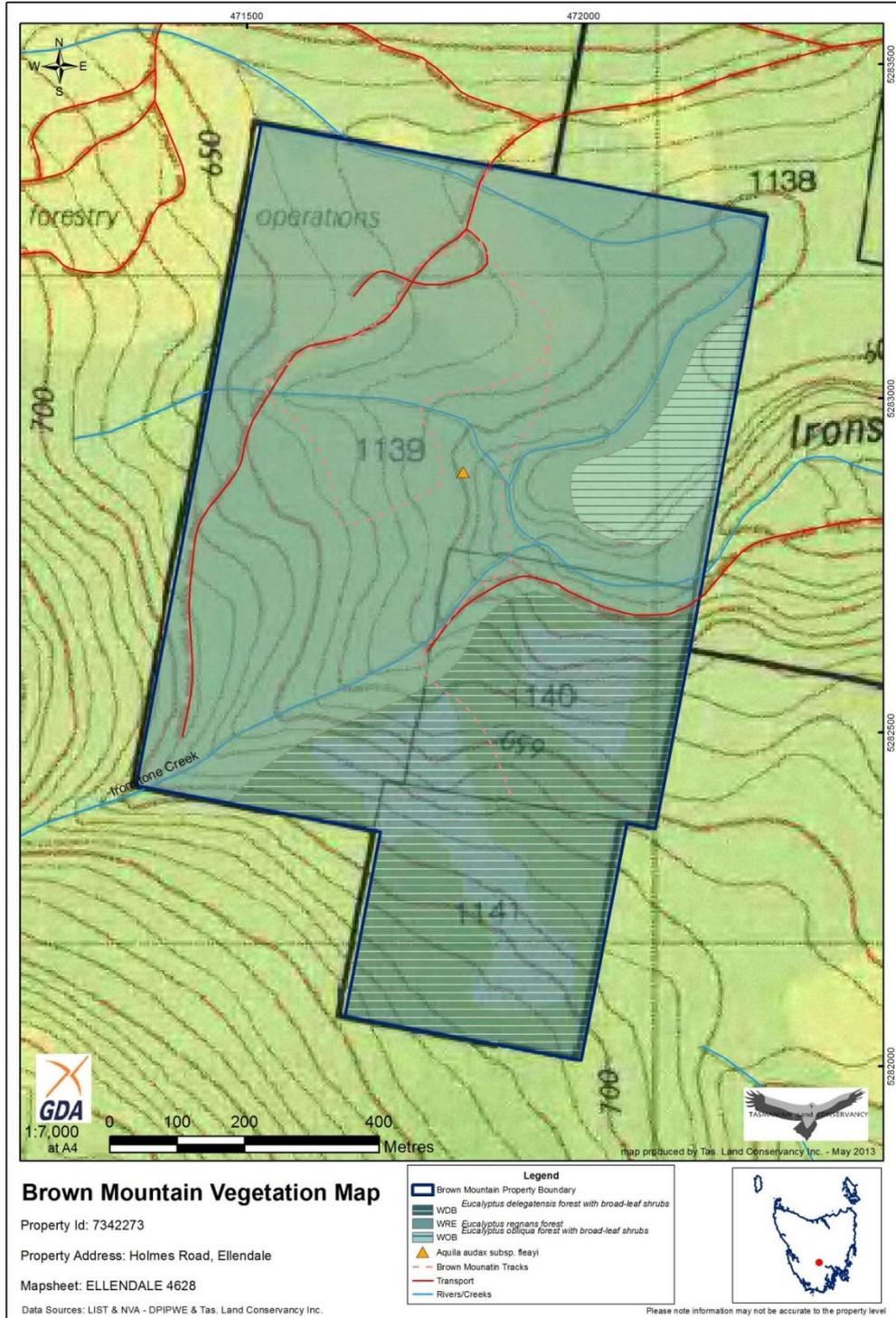


Figure 3 Vegetation and threatened species records, Brown Mountain Reserve

CONSERVATION TARGET

Wet Forest Ecosystem

Goal: Maintain or improve the 2016 condition of the forest

Tall, wet eucalypt forest occupies the entire area of the Reserve, with trees exceeding 50m in height in some areas. The canopy is variously dominated by Swamp gum (*Eucalyptus regnans*), gum-topped stringybark (*E. delegatensis*) and brown-topped stringybark (*E. obliqua*). The understorey varies with topography and disturbance history. Rainforest species such as myrtle (*Nothofagus cunninghamii*) and sassafras (*Atherosperma moschatum*) dominate in the riparian zone along Ironstone Creek and in wetter areas throughout the Reserve, with soft tree ferns (*Dicksonia antarctica*) also prominent. In drier areas and areas that have been disturbed by past logging activity the understorey is dominated by silver wattle (*Acacia dealbata*) and broadleaf shrubs such as dogwood (*Pomaderris apetala*) and musk (*Olearia argophylla*). Ground cover is typically dominated by ferns, sedges and mosses and can be extremely dense in areas where logging activity has created gaps in the canopy.

Wet eucalypt forest on the Reserve falls into three vegetation types under the TASVEG classification:

- *Eucalyptus obliqua* forest with broadleaf shrubs (WOB);
- *Eucalyptus delegatensis* forest with broadleaf shrubs (WDB); and
- *Eucalyptus regnans* forest (WRE).

Rationale for identification of a single conservation target:

- the area has vegetation that is structurally similar;
- the area shows little variation in the composition of understorey vegetation;
- the vegetation is expected to show a similar response to ecological events such as fire and drought;
- the target occupies an area with distinct and relatively uniform environmental conditions; and
- threats to the target apply equally to all areas where it occurs.

Viability

Wet Eucalypt Forest is in good condition at present. Approximately 30% of the property was logged in the 1990s and is now regenerating. Little management intervention is required to maintain the target in its present condition and the condition of the target is expected to improve over time as regeneration continues.

Key Environmental Attribute	Indicator
Vegetation condition	Floristic diversity Structural complexity Canopy recruitment
Fauna	Vertebrate fauna diversity

Threats and management

Illegal access

The access tracks into the Reserve are not gated and the boundary is not fenced, which creates the potential for unwanted vehicle access. Such access has the potential to act as a vector for a range of threatening processes, including: the introduction of fire or weeds; illegal wood-cutting or tree fern harvest; and rubbish dumping. Illegal vehicle access has not been an issue to date and arguably the Reserve is not a likely target given the range of alternative destinations in the surrounding landscape. However, given the significant tree fern resource on the Reserve, the presence of specialty timber species and the isolation of the site, it could become an attractive target for illegal harvest of these species in future.

Fire

The rainforest species in the understorey of the wet forest on the Reserve are highly sensitive to fire. Surrounding properties are managed for timber and woodchip production and the silvicultural practices include the burning of residue after harvest. As a result, there is the potential for fires to escape from neighbouring properties and to affect the Reserve. There is also an ongoing risk from wildfires in the broader landscape, whether they result from arson, accidental ignition or natural ignition sources such as lightning.

Invasive species

Blackberry (*Rubus fruticosus*) and foxglove (*Digitalis purpurea*) occur in surrounding areas and these species are known to affect disturbed areas of wet forest. The Reserve was selectively logged in the 1990s and there is the potential for weeds to establish in areas disturbed by logging.

The Reserve contains a healthy population of the introduced Superb Lyrebird (*Menura novaehollandiae*). While there has been speculation about how this species may impact negatively on native ecosystems in Tasmania, any impacts are currently not well documented or understood. Feral cats are also known to occur on the Reserve and have been identified on motion sensor cameras. Cats are known to impact on a range of ground-nesting birds and 'critical weight range' mammals, especially native rodents and small marsupials such as antechinus. Antechinus are likely to occur in the gully and forests of Brown Mountain Reserve and could be impacted by feral cats.

Threat	Impact	Threat rating	Management strategy
Lack of knowledge	Ineffective management	Low	<ul style="list-style-type: none">• Improve understanding of fauna and flora• Annual reserve assessment
Fire	Loss of species diversity and structural complexity	Medium	<ul style="list-style-type: none">• Access management• Neighbour relations
Invasive species	Displacement of native species Habitat modification Disruption of natural ecological interactions	Low	<ul style="list-style-type: none">• Management of invasive species• Access management• Neighbour relations

			<ul style="list-style-type: none"> Annual reserve assessment
Illegal access	Vector for introduction of threatening processes	Low	<ul style="list-style-type: none"> Access management Neighbour relations Annual reserve assessment

SOCIAL TARGET

Community connection to the landscape

Goal: Community are engaged with the Reserve and region

The TLC encourages connection to the landscape as an end in itself, and to ensure that reserve networks are valued and supported in the community. The TLC supports appropriate public access to all its reserves and aims to foster a community volunteer relationship with this Reserve. Where possible the TLC will enlist the help of the community to assist with onsite reserve activities such as assessment, monitoring, fencing and weed management to maintain connection with the landscape and its contribution to the region.

Viability

Viability for this target is rated as good, with a strong community connection to the Reserve through neighbours and former members of the Brown Mountain Association.

Key Attribute	Indicator
Community involvement	Number of events, activities and visitors.

Threats

The lack of knowledge, understanding and appreciation of this landscape are the primary threat to achieving this objective. This may arise from a lack of, or poor communication with stakeholders or the lack of opportunities for the wider community to become, or remain, engaged with the TLC.

Threat	Impact	Threat rating	Management strategy
Lack of knowledge	Lost opportunities to better understand and manage the Reserve	Low	<ul style="list-style-type: none"> Community engagement

MANAGEMENT STRATEGIES

Improve understanding of flora and fauna

Priority: Medium

Objectives: By 2020 species of conservation significance which occupy or utilise the Reserve have been identified and their habitat is being managed effectively.

There are a number of threatened fauna species that occur or are likely to utilise the Reserve (see Table 1), but targeted surveys are needed to improve our understanding so that their specific management needs can be taken into consideration in future planning.

Key actions:	Details
Targeted surveys for priority species	Surveys for threatened fauna listed in Table 1.
Monitoring:	Details
Annual reserve assessment	Undertake annual reserve inspection to identify ongoing or new threats.
Long term ecological monitoring	Install ecological monitoring in 2016 and ensure motion sensor cameras can also target lyrebird activity

Access management

Priority: Medium

Objectives: Ensure access arrangements are adequate to meet reserve management needs;
Exclude known threats, including fire, wood/fern-cutting and weeds.

There is currently a rough, unmaintained 4WD track used to access the Reserve from Holmes Road Ellendale, via land owned by Norske Skog. The TLC does not have a legal right of access across the Norske Skog land. While the lack of a secure legal right of access does not currently limit the ability of the TLC to manage the Reserve, it does create a risk which should be mitigated if possible.

Vehicle access is not currently required for management of the Reserve, although it is useful in reducing the time taken to reach the Reserve boundary. If the vehicle access track becomes overgrown, this effectively acts as a fence preventing unauthorised vehicle access.

The vehicle access tracks into the Reserve are not gated and the boundary is not fenced, which creates the potential for unwanted vehicle access which has the potential to act as a vector for a range of threatening processes, including the introduction of fire, weeds, illegal wood/fern-cutting and rubbish dumping.

Although the risk of vehicle trespass appears to be low at present, this situation could change very quickly and annual reserve assessments need to monitor for indications of vehicle activity. If illegal vehicle access becomes a problem in future then additional management actions can be undertaken to restrict or prevent it.

Key actions:	Details
Establish legal access to the Reserve	Negotiate Right of Way with Norske Skog
Signage	Maintain signs
Monitoring:	Details
Annual reserve assessment	Monitor signs, tracks and any evidence of recent wood/fern-cutting or rubbish dumping

Invasive species management

Priority: Medium

Objectives: Minimise the likelihood of introducing weeds and manage the impacts of any existing weeds;

By 2020 the impact of Lyrebirds is better understood including whether they pose a threat and require management.

Blackberry and foxglove occur in the surrounding landscape and have the potential to invade the Reserve, particularly in previously disturbed areas. The TLC will monitor the reserve annually and control and eradicate any weeds wherever necessary.

The Reserve contains a healthy population of the introduced Superb Lyrebird. A site inspection in 2015 to detect Lyrebird activity found several sites where males were recorded displaying on 'arena-mounds'. The impacts of this species on the natural values of the Reserve are unknown.

Key actions:	Details
Implementing TLC's hygiene policy	Wash-down of vehicles after visits, boot hygiene etc .
Lyrebird investigation	Develop a research project to determine lyrebird impact suitable for UTAS Honours or Masters students.
Monitoring:	Details
Annual reserve assessment	Monitor for weeds Record extent and abundance of any weed species found

Fire management

Priority: Low

Objectives: Minimise fire risk to the Reserve and to surrounding communities.

While fire can be a natural process, the two primary objectives of fire management on TLC land are to protect human life and property from fire and to maintain or enhance the natural diversity of species and communities through appropriate fire regimes, in so far as this is consistent with the first objective.

The rainforest species in the understorey of the wet forest on the Reserve are highly sensitive to fire and every effort should be made to exclude fire. To prevent fires starting on the Reserve, camp fires are not permitted and there is a 'fuel stove only' policy in effect. The TLC has limited capacity to influence the threat from fires started on adjoining properties or wildfires in the broader landscape, but working cooperatively with the TFS and neighbours, and engaging with the local community, can assist in preventing unwanted fire, excluding it from the Reserve and minimising the impact on the Reserve if it does occur.

Key actions:	Details
Fire planning	Work cooperatively with TFS and neighbours on fire planning and response for the area
Monitoring:	
Conduct annual fire risk assessment	Assess the fire risk that the Reserve poses to human life, property and the environment Recommend and implement actions for minimising risk to acceptable levels.

Community engagement

Priority: Low

Objective: Regular visits are made to the Reserve by staff, partners and volunteers

The TLC encourages visitors, especially supporters, to its reserves. The location of the Reserve means that it is unlikely to attract many supporters and bushwalkers, but walkers do occasionally use the Reserve to access Manny's Marsh in the Mt Field National Park and the historical relationship with the Brown Mountain Association creates a high potential for visitation by supporters with strong personal ties to the Reserve. A group of local supporters and residents has previously expressed interest in establishing a loop track to Manny's Marsh starting and ending on the Reserve, but this proposal has not progressed since 2010.

Visitors to the Reserve should be aware of conservation values, biosecurity protocols and conditions that apply to use and enjoyment of the Reserve. To facilitate this the TLC must make information available to visitors and other stakeholders on its web site and more widely.

Key Actions	Details
Communications	Develop and provide visitors with information on reserve values, use conditions, biosecurity protocols and seasonal constraints.
Community engagement	Foster interested groups through TLC communication channels to support and protect the Reserve
Key Monitoring activities	Details
Visitor numbers	Monitor visitor numbers and activities (no. of events, activities and visitors)

Annual reserve assessment

Priority: High

Objectives: Exclude known threats, including fire, wood/fern-cutting and weeds;

No new threats emerge from 2016

Annual reserve assessment and liaison with neighbours is routinely conducted by TLC Reserve Management Staff to identify any new or resurgent threatening processes that have the potential to reduce the viability of the targets. On the Reserve these threats include fire and weeds.

Key actions:	Details
Annual reserve assessment	Track any new threats, monitor success of existing strategies

MANAGEMENT PLAN PROCESS

Management Plan Status

The final draft of this Plan will be reviewed by the TLCs Science Council before being submitted to the TLC Board for approval. As part of the Open Standards adaptive management process, progress on target viability, management effectiveness and our understanding of biology and social impacts will be kept current.

Management Responsibilities

TLC staff are responsible for undertaking the management of the Reserve. This includes the co-ordination of contractors, consultants and volunteers where they are required to implement the management actions outlined in this Plan. Relevant experts from the TLC Board and Science Council will also be requested to provide advice and guidance where needed. Wherever possible, the TLC works with neighbours to manage cross-tenure threats. The TLC will endeavour to act as a good neighbour to all parties and, where possible, undertake co-operative or complementary management where both parties seek a similar outcome (e.g. weed control and fire management). The TLC will undertake every endeavour to ensure that management of this Reserve does not have a detrimental impact on the surrounding area.

Stakeholder Involvement

The major land management stakeholders to this plan are the Tasmanian Parks and Wildlife Service, DPIPWE and Norske Skog. The Private Land Conservation Program may help to monitor the status of the conservation values identified in the covenant. These stakeholders may be involved with practical implementation of management actions and any monitoring or adaptive changes needed.

Management Plan Review

This document will guide on-ground management of the Reserve over the coming years and be the basis to develop annual work plans and budgets. The plan identifies a range of conservation targets, threats, strategies and actions based on our best current knowledge but these may change over time as our information increases and monitoring data can better inform our activities. In implementing the adaptive management process identified by the TLC's Reserve Management Policy, progress towards meeting the objectives of this plan will be reviewed at regular intervals not exceeding every two years. These reviews may lead to minor amendments to the plan.

A full review of the plan will occur at a time no earlier than five years and no later than ten years from the date of adoption of this plan.

References

Tasmanian Land Conservancy (2016). Brown Mountain Reserve Background Report. Tasmanian Land Conservancy, Tasmania Australia.

Acronyms and abbreviations

DPIPWE	Tasmanian Government Department of Primary Industries, Parks, Water and Environment
EPBC Act	Australian <i>Environment Protection and Biodiversity Conservation Act 1999</i>
IUCN	International Union for Conservation of Nature
NC Act	Tasmanian <i>Nature Conservation Act 2002</i>
NVA	Natural Values Atlas database (DPIPWE)
PWS	Tasmania Parks and Wildlife Service
TASVEG	Tasmanian Vegetation Monitoring and Mapping Program (TASVEG 2.0, 19 February 2009)
TFS	Tasmania Fire Service
TLC	Tasmanian Land Conservancy
TSP Act	Tasmanian <i>Threatened Species Protection Act 1995</i>
UTAS	University of Tasmania