TASMANIAN
LAND
CONSERVANCY

Annual Reserve Report

Vale of Belvoir Reserve 2014-15

www.tasland.org.au

INTRODUCTION

The Tasmanian Land Conservancy (TLC) protects important natural areas as permanent reserves and aims to demonstrate excellence in reserve management for biodiversity conservation. To achieve this aim, the TLC has adopted an adaptive management framework – the Open Standards for the Practice of Conservation. The framework comprises 6 key steps – planning, implementing, monitoring, reporting, review/adaptation and communication.

The Vale of Belvoir Reserve was acquired by the TLC in 2008 and protects 476 hectares of highland grassland, wetlands and rainforest in the Tasmanian highlands, northwest of Cradle Mountain National Park. The management of the Reserve is guided by the Vale of Belvoir Reserve Management Plan. The plan is implemented by TLC staff through an Annual Work Plan and Monitoring Plan. Details of ecological monitoring methods can be found in TLC's Ecological Monitoring Procedures Manual.

This report describes progress made towards delivery of the management plan in 2014-15, and is divided into three sections:

1. Reserve Scorecard – a table summarising the results of ecological monitoring to date;
2. Management Summary – providing details of the implementation of key management strategies and making recommendations for plan improvement;
3. Ecological Monitoring Summary – providing details of the status of conservation targets and trends of key ecological indicators

The recommendations made in this report are used to adapt and improve management of the Reserve, update the management plan, and revise work and monitoring plans for the coming year. Key findings of this report are communicated to TLC Board, supporters and other stakeholders.

VALE OF BELVOIR RESERVE SCORECARD

Monitoring			
Target	***Indicator***	***Status 2014-15***	***Trend***
Highland grassland	Floristic diversity	10.7	N/A baseline data
	Structural complexity	2.6	
	Leucochrysum albicans	14	
	Stackhousia pulvinaris	20.4	
	Oreixenica ptunarra	22	
Streams and wetlands	Floristic diversity	12.4 species/site	
	Structural complexity	2.3 strata/site	
	Water quality	Poor	
	Pugging	Most sites	
Highland forest	Floristic diversity	9.2 species/site	
	Structural complexity	5 strata/site	
	Canopy cover	2.1	
Vertebrate fauna	Total species	23	
	Richness per site	7.5	
	Abundance per site	171	
Community connection to landscape	# volunteer days on the Reserve	48	
	# visitors to the Reserve	100+	
Management Effectiveness			
Strategy	***Indicator***	***Status***	***Trend***
Grazing management	Grazing intensity	2.3 DSE / ha	Small decrease
	Grazing timing	Spring-Autumn	N/A
Fire management	Fire extent (ecological)	0	Flat
	Fire extent (unplanned)	0	Decrease
Weed management	Weed extent - Scotch thistle	100 m^2	Flat
	Treatment extent (m^2)	0	Flat
Wasp management	Trapping effort	2 traps	Flat
Access management	Unauthorised access	Infrequent	Flat
Waste water treatment	Treatment system installed?	No	
Visitor management	Condition of reserve infrastructure	Good	Flat
Community engagement	# events at the Reserve	1	Flat
	# of volunteer activities at the Reserve	4	Increase

MONITORING SUMMARY

Highland grasslands

Highland grasslands are the most significant conservation feature of the Vale of Belvoir Reserve and are a mosaic of communities with the dominant species highly dependent on drainage and geology. The most productive sites are dominated by grasses, wetter sites are dominated by sedges and cord rushes, and hills by native irises. The grasslands contain an outstanding diversity of wildflowers including many threatened species e.g. the grassland paper daisy *Leucochrysum albicans* and alpine candles *Stackhousia pulvinaris.* The grasslands also support diverse fauna, including high populations of native carnivores such as the Tasmanian devil, and grassland specialists such as the ptunarra brown butterfly and tussock skink – both threated species.

Goals

- Maintain the floristic diversity of highland grasslands within 25% (ongoing)
- Maintain the structural complexity of highland grasslands within 25% (ongoing)
- Maintain the extent of highland grasslands within 10% (ongoing)

Vale wildflowers

Ecological indicator	Current status	Trend
Floristic diversity (species per site) - All sites - Burnt area (2012) - Cattle grazing intensity – high (>50 pats/site) - Cattle grazing intensity – low (<10 pats/site)	 10.7 9.8 11.5 11.6	Unknown
Structural complexity (strata per site)	2.6	Unknown
Leucochrysum albicans (cm cover per site)	14	Flat
Stackhousia pulvinaris (cm cover per site)	20.4	Flat
Oreixenica ptunarra (# butterflies/100m transect)	22 (Sep 2015 burn area only)	Baseline data

Key findings

- The grasslands are generally in excellent condition and support important populations of threatened plants and animals. There is strong evidence now that cattle grazing has no effect on floristic diversity.
- An inverse relationship was observed between the occurrence of rare and threatened plants and cattle dung density (as a proxy for cattle grazing intensity), although this may not be causal. The 2012 fire had no statistically significant effect on floristic diversity
- Ptunarra brown butterflies occur throughout the grasslands with varying population densities possibly related to Poa density.

Recommendations

- Consider phasing out cattle grazing and investigate whether fire management alone can provide the necessary disturbance required for maintenance of grassland diversity.
- Increase monitoring of threatened plants to ensure the early detection and mitigation of any unexpected impacts associated with cessation of cattle grazing.
- Continue long-term ecological monitoring of vegetation

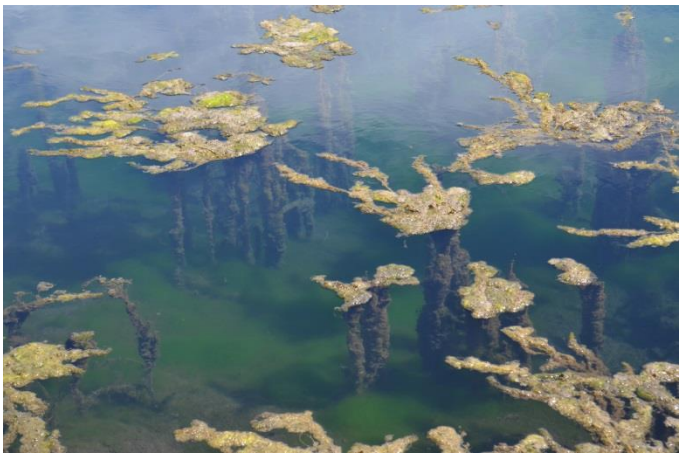
Streams and wetlands

The Vale of Belvoir forms the upper catchment of the Vale River, and is scattered with numerous streams and wetlands. Limestone underlies the whole valley and a range of karst features, including caves, sinkholes and outcroppings are scattered across the landscape.

In the summer of 2014/15 TLC conducted research at the Vale of Belvoir that examined effects of cattle grazing on the Reserve's biodiversity. This research has shown that grazing intensity is concentrated around streams and wetlands and is causing significant impacts on these sensitive areas.

Goals

- Improve the condition of wetlands at the Vale.



'The Octopus' Garden' mineral spring

Ecological indicator	Current status	Trend
Floristic diversity	12.4 species/site	Unknown
Structural complexity	2.3 strata/site	Unknown
Pugging	All unfenced wetlands	
Water quality	Data collection planned 2016	

Key findings

- Floristic diversity of riparian vegetation is high
- Observations show that pugging by cattle has affected the majority of wetlands across the Reserve. The impact ranges from moderate to severe, and some wetlands are in extremely degraded condition.
- Cattle are affecting water quality. Pugging causes increased turbidity in streams and wetlands. Cattle urine and faeces is also being deposited in large quantities into the wetlands.
- Cattle are trampling and defecating on sensitive vegetation and their impact on sphagnum peatland is of particular concern. Anecdotal evidence provided by Dr Jennie Whinam, an expert in sphagnum ecology and conservation, suggests that sphagnum at the Reserve has declined significantly and that this is due at least in part to cattle.

Recommendations

- Phase out grazing at the Vale of Belvoir in the short-term
- Continue long-term ecological monitoring of vegetation
- Implement water quality monitoring

Highland forest

Highland forest occurs on the eastern and western slopes of the Vale of Belvoir. Grassy woodland dominated by cider gum fringes the open grassy valley. These woodlands are exceptionally diverse in terms of flora, and are a hotspot of activity for fauna. Beyond the woodland fringe, fire has created a sharp boundary where the vegetation changes suddenly to closed rainforest dominated by mature myrtle, with a dark but open understorey covered in mosses, lichens and fungi.

Goals

- Maintain the approximate extent and condition of highland forests.
- Prevent eucalypts and shrubs from encroaching on grassland areas.

Highland rainforest

Ecological indicator	Current status	Trend
Floristic diversity	9.2 species/site	Unknown
Structural complexity	5 strata/site	Unknown
Recruitment		

Key findings

- The diversity of vascular plants in eucalypt woodlands is exceptionally high. Rainforests are low in vascular plant diversity, but may be high in bryophyte and fungi diversity.
- Forest areas are a hotspot for wildlife.
- Vegetation is in excellent condition.

Recommendations

- Continue long-term ecological monitoring
- Encourage a research project investigating non-vascular flora

Community connection with the landscape

The Vale of Belvoir Reserve provides the community with a range of recreational, educational, research and volunteering opportunities. Volunteers have made a fantastic contribution to TLC efforts to establish TLC's long-term ecological monitoring program over the past year. TLC hosts a biennial wildflower open day that attracts hundreds of people to the Vale to see its spectacular display of native species. The Vale has a long history of cattle grazing and the TLC maintains a good relationship with the previous owners who maintain strong ties to the place.

Goals

People visit the Vale of Belvoir every year

Volunteers contribute at least 50 workdays each year

At least one research project or educational activity is conducted on the Reserve each year

Volunteers monitoring threatened wildflowers

Community indicator	Current status	Trend
Volunteer days	50 volunteer days	Flat
Visitors	100+ visitors	Flat
Research and education	4 projects	Increase

Key findings

- Teams of volunteers installed long-term monitoring sites and collected data over the course of four field trips
- The biennial Vale of Belvoir Wildflower day was held in summer 2014 and was attended by over 100 people
- Ms Blanka Tengia from the University of Tasmania completed a masters research project investigating the impact of grazing on wetlands
- Jo Potter from the University of Tasmania is undertaking a PhD research project investigating the impact of wasps on ptunarra brown butterflies
- TLC partnered with UTAS and consultant Dr John Davies to re-assess grassland exclosure plots and a paper is being prepared
- A class of students from the University of Melbourne completed a two week intensive field course investigating the ecology of grasslands and rainforests.
- Numerous visitors to the reserve

Recommendations

- Continue to encourage community connections to the reserve by providing opportunities for research, education, recreation and volunteering

MANAGEMENT EFFECTIVENESS SUMMARY

Grazing management

There has been a long history of cattle grazing at the Vale of Belvoir and grassland ecologists have suggested that grazing may have helped maintain grassland diversity, by preventing grass species from outcompeting herbs and other minor species. Following the Reserve's acquisition, the TLC has continued to allow cattle grazing under a lease arrangement with the previous owners, while the effects of grazing on biodiversity values are determined.

Key objective(s)

Maintain good relationships with the Charleston family and the Parks and Wildlife Service.

Manage grazing in accordance with lease arrangements.

Assess the impact of cattle grazing on the Vale's biodiversity.

Outcome 2014

The historic grazing regime was maintained – cattle numbers were reduced by 30%

Several research projects investigated the impact of cattle grazing on a range of natural values.

Cattle grazing was found to be having an unacceptable impact on the wetlands at the Vale of Belvoir.

Further studies are required into managing disturbance in the grasslands without cattle grazing.

A wetland impacted by cattle grazing

Progress in 2013-14

Grazing management

- TLC continued to manage grazing at the Vale in accordance with lease arrangements. Approximately 120 cows and 60 calves were grazed at the Vale between mid-January and May, equating to a grazing intensity of 0.715 DSE per hectare.
- TLC continued to maintain good relations with the Parks and Wildlife Service and the Charleston family.

Grazing research

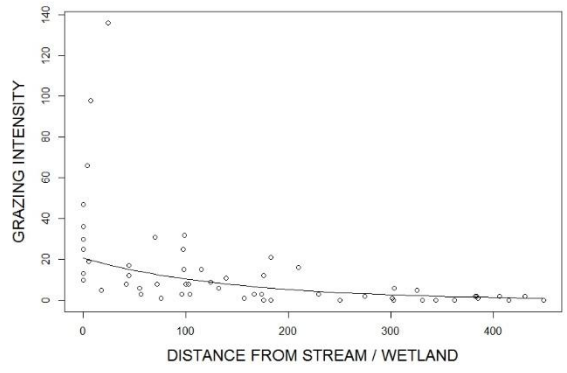
- A project assessing the effect of grazing intensity on wetlands, threatened species and vegetation condition was completed in summer 2014 and is being prepared for publication. Preliminary findings are that grazing is negatively impacting wetlands due to pugging,

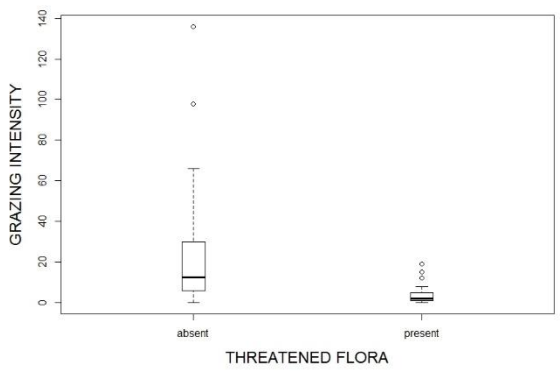
nutrient loading and sedimentation. An inverse relationship was observed between the occurrence of rare and threatened plants and cattle dung density (as a proxy for cattle grazing intensity), although this may not be causal. No significant relationship was found between grazing and floristic diversity.

- Cattle exclosures established in the 1990s were reassessed by Denna Kingdom and botanist John Davies, with data analysed by Prof. Mark Hovenden. No significant relationship was found between grazing and floristic diversity. The data raised questions about the impact of fire on the grasslands following a long-term lack of disturbance (i.e. fire or grazing). This will be the subject of ongoing monitoring and research
- A University of Tasmania research project investigated the impact of cattle on wetlands. The project was divided into two parts – an intensive floristic study of a single fenced wetland, and a rapid assessment of 36 wetlands distributed across the entire valley. While the intensive study found no significant impact of cattle on floristic diversity, the study site was located in an area where cattle grazing intensity was low. The widespread, rapid assessment of wetlands across the reserve found that cattle are causing significant degradation to wetlands, riparian vegetation and sphagnum peatland.

Recommendations

- Cattle grazing at the Vale of Belvoir should be discontinued due to the impact on wetlands, and due to the potential impact on threatened plant species.
- Options for removing cattle should be considered by the Reserves and Science Teams and could include immediate cessation of grazing or phasing out grazing.
- There is community sensitivity surrounding the cultural significance of highland grazing and this will need to be managed. Maintaining a good relationship with the Charleston family should be a priority.
- Communicate the findings of monitoring and research to stakeholders including relevant experts, conservation professionals, TLC supporters and the wider community. Publish findings in a peer reviewed scientific journal.
- Implement the ecological burning program to ensure that an appropriate disturbance regime is present that maintains the conservation values of the Reserve, in particular grassland floristic diversity and threatened species.
- Continue to take a precautionary approach by monitoring the Reserve annually, so that any potential adverse effects associated with grazing cessation are identified immediately. Particular focus should be on disturbance regimes, the role of fire in maintaining diversity, and threatened plant population dynamics.





Fire management

Fire has been an important ecological process at the Vale of Belvoir for thousands of years. The burning practices of aboriginal people and then graziers are largely responsible for the extent and condition of today's grasslands. Cool burns at the end of winter maintain the openness of grassy vegetation, which enables wildflowers to thrive. Fires also prevent the encroachment of trees and shrubs into grassland areas. The TLC commissioned two expert fire ecologists to prepare a fire management strategy in 2013, and began implementing a program of ecological burning in 2014, with the aim of maintaining the diversity and extent of grasslands at the Vale.

Key objective(s)

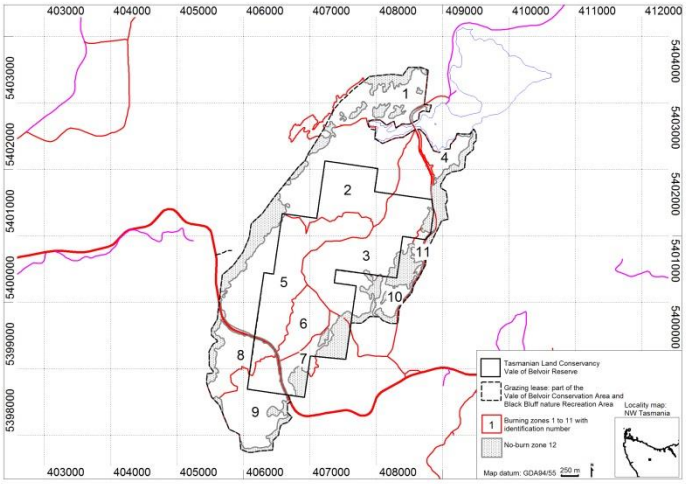
No unauthorised fires occur on the reserve (ongoing)

Ecological burns are used to maintain floristic diversity of grasslands

Outcome to 2015

One unplanned fire (92ha) in 2012

TLC's ecological burn program is now being implemented; an ecological burn planned for Sep/Oct 2014 did not occur due to poor weather and regulatory issues



Map showing ecological burn zones

Progress to 2014-15

- An unauthorised fire in 2012 burnt 92 hectares of grassland in the Reserve and a more extensive area of public land. The fire is likely to have had a positive impact on grassland diversity.
- A fire management strategy for TLC Reserves was completed in 2014
- TLC continues to maintain good relations with the PWS
  Denna Kingdom completed a fuel assessment with fire ecologist Jon Marsden-Smedley in Sep 2014 and identified area/s to burn. A burn planned for Sep/Oct 2014 did not occur due to poor weather and regulatory issues (permits for threatened species and covenant were not issued within the required timeframe). This burn was re-scheduled for September-October 2015.

Key recommendations for future management

- Implement the fire management plan prepared by John Marsden Smedley and Steve Leonard, including monitoring
- Install additional monitoring sites in the burn area.
- Request regulatory permits for burning 6 – 12 months before the planned burn timeframe, to ensure that permits are received in sufficient time.

Weed management

The Reserve is largely free of weeds. There are isolated patches of Scotch thistle, but these pose minimal threat to the natural values and are a low priority for management. Gorse, broom, blackberry, foxglove and ragwort occur in the local area and pose a more serious threat to the values. Ongoing monitoring will minimise the risk of these weeds becoming established.

Key objective(s)

Control existing infestations of scotch thistle.

Prevent establishment of other weed species.

Outcome to 2015

Monitoring has shown that weeds are largely absent from the Vale.

Progress in 2014-15

- Occasional thistles and exotic grasses are scattered over the property but don't present a threat to the natural values.
- Weeds are more prevalent in areas where cattle grazing intensity is higher, especially at cattle 'camps'.
- No new infestations of weeds were identified.

Key recommendations for future management

- Continue to monitor for priority weeds species such as ragwort
- Update weed mapping

Feral animal management

European wasps have been recorded preying on endangered ptunarra brown butterflies in areas nearby to the Vale of Belvoir, where butterfly populations have subsequently crashed. Postgraduate research is currently being undertaken by Josephine Potter to quantify the specific impact that European wasps have on ptunarra brown butterfly populations, and to determine how well wasp control measures limit the impact of the wasps. It is likely that, if wasps are present in high numbers, undertaking active wasp control during March when adult ptunarra brown butterflies are emergent, will restrict the impact that wasps have on this species.

Cats present a serious threat to native animals. At the Vale of Belvoir cats are in relatively low numbers.

Rabbits are also in low numbers.

Key objective(s)

Reduce the impact of European wasps on ptunarra brown butterflies.

Determine whether cats and rabbits present a significant threat to natural values.

Outcome to 2015

Research is being conducted into the impact of European wasps on ptunarra brown butterflies.

Wasps are in low numbers.

Trapping of European wasps has commenced.

Monitoring of feral animals has commenced.

A wasp trap set at nearby Surrey Hills grasslands

Progress in 2014-15

- Two wasp traps were set in March 2015.
- A UTas post-graduate research project investigating the impact of wasps on ptunarra brown butterflies commenced in 2011 and is continuing.
- Fauna monitoring has shown that cats and rabbits are in low numbers and do not constitute a threat to the targets at present.

Key recommendations for future management

- Continue to set wasp traps, and search for and destroy any wasp nests found. Collect data on the location and number of wasp nests controlled, to monitor changes in the relative abundance and distribution of wasps. If wasp numbers are found to be increasing then a systematic search for wasp nests should be considered.
- Continue to monitor feral cats and rabbits.

Community engagement

The TLC encourages and facilitates public access to reserves for a variety of purposes including recreation, research, volunteering and business. People are encouraged to visit the Vale of Belvoir to pursue a variety of low-impact recreational activities including walking, wildlife viewing, trout fishing and photography. Pets, hunting and off-road vehicle use are not permitted. Volunteers contribute to the management and monitoring of the reserve. A wide range of scientific research projects have been facilitated at the Vale, which presents a fantastic natural laboratory for the study of ecology and conservation.

Key objective(s)

TLC provides opportunities for the community to connect to the reserve through visitation, volunteering, research and education

Outcome to 2015

- Volunteers were involved in four monitoring and management trips.
- TLC facilitated two university research projects.
- Numerous people visited the Charleston's hut and recorded their visits in the visitor book.

Supporters enjoying a quiet moment on the Vale at lunch time

Progress in 2014-15

- A draft visitor guide has been prepared, to be finalised in 2015/2016
- A class of students from the University of Melbourne completed a two week intensive field course investigating the ecology of grasslands and rainforests.
- Volunteers assisted with scientific monitoring

Key recommendations for future management

- Continue to provide opportunities for people to connect with the Reserve.
- Continue to maintain relationships with neighbours.
- Record entries in the visitor book at the Charleston's hut to monitor ad hoc visitor numbers.