

# VALE OF BELVOIR PURCHASED BY THE TASMANIAN LAND CONSERVANCY

– Denna Kingdom & Rolan Eberhard

*The Vale of Belvoir is a place of global significance for its rich and dense marsupial carnivore fauna. It is the only remaining example of the western Tasmanian lowland valleys hunted and burned by the Tasmanian people at the height of the last ice age. It is important for the many threatened plant and animal species that survive within it, for the threatened grasslands and herbfields that cover its floor, for its geodiversity values, and for its outstanding natural beauty. Many of the outstanding universal values that resulted in the listing of the Western Tasmanian Wilderness World Heritage Area are best expressed, or only expressed, in this valley. The securing of this valley would be the Tasmanian conservation triumph of the 21st century.* – Jamie Kirkpatrick, Professor of Geography & Environmental Studies, University of Tasmania.



A view of the Vale of Belvoir.

Earlier this year the Tasmanian Land Conservancy (TLC) successfully negotiated to purchase the 473 ha Vale of Belvoir property near Cradle Mountain in northern Tasmania. In addition to its biodiversity values, the Vale is significant as one of Australia's few subalpine karstlands.

It has an unusual and interesting geomorphology, due in part to an interaction of karst processes and cold climate effects associated with its elevation and proximity to the Central Plateau ice sheet, which covered much of central Tasmania in the recent geological past.

The Vale is both scientifically interesting and aesthetically stunning. A walk in the Vale on a clear winter day dodging iced over karstic ponds and the numerous wombats, or during the brief blooming of the alpine wildflowers in spring, sticks in the memory for a long time.

For those who have come across the TLC before, it is a non-government, not-for-profit organisation. The organisation was initiated in 2001 by three volunteers, with the goal of protecting Tasmania's biodiversity through conservation on private land.

From small beginnings, the TLC has grown dramatically, and is now recognised as one of Tasmania's leading conservation organisations. TLC has now protected about 50,000 hectares of land through three major programs: permanent reserves, a 'revolving fund' for the purchase, protection and on-sale of private land, and the facilitation of private conservation covenants.

The TLC became interested in the Vale of Belvoir in 2003, upon learning of its unique mosaic of conservation values, including threatened plant species, habitat for threatened animals, unusual geomorphology and wetland features. Subsequent negotiations saw the TLC purchase the Vale of Belvoir from the Charleston family, who had managed the property for summer-grazing of cattle since the 1860s.

The ecological disturbance provided by the low-levels of cattle grazing and mosaic burning has been linked to the presence of high-diversity grasslands and some threatened plant species.

Amongst other experts, Professor Kirkpatrick has noted the loss of diversity in other similar areas where grazing and burning were discontinued in the 1960s. The TLC is continuing scientific research investigating this correlation and will manage the property for its conservation values according to the results of the research.

In keeping with the management of the Vale of Belvoir for all of its conservation values, the TLC has noted and is managing the negative impacts of the cattle on the wetlands and karst. In April and October 2010, TLC staff and volunteers worked with fencing contractors to install cattle-proof fencing around 24 hectares of wetlands and karst outcrops. This will improve the water quality by reducing nutrification and sedimentation, and minimise the physical damage to sensitive soils around wetlands.

In addition to the Vale of Belvoir, the TLC has facilitated the purchase and subsequent reservation of a number of properties at Mole Creek, which were acquired with funding from the Commonwealth government under the Forest Conservation Fund.

The majority of these properties have been transferred to the Tasmanian Parks and Wildlife Service, which manages them as part of a suite of karst reserves around Mole Creek.

The TLC actively seeks support from the community, who can help by making tax-deductible donations or volunteer their time to support the organisations invaluable work. More information can be found on the TLC website <[www.tasland.org.au](http://www.tasland.org.au)> or by phoning (03) 6225 1399.

# PROTECTION STATUS OF KARST IN TASMANIA

– Rolan Eberhard



Roland Eberhard – in a hole, in Tasmania.

## INTRODUCTION

In a previous contribution to this newsletter I reviewed the protection status of Tasmania's karst estate with respect to land tenure arrangements (Eberhard 2007). I reported that about 74% of Tasmania's most highly karstic carbonate rocks (54% of all carbonate rocks including less karstic strata) were subject to varying degrees of statutory or administrative protection within the so-called CAR (Comprehensive, Adequate, Representative) Reserve System.

The earlier paper concluded that while this was an encouraging result, some outstanding karst features and systems still lacked adequate protection. The underlying GIS analysis was repeated in a more rigorous way for state of environment reporting in 2008. This article provides an update based on that analysis and other recent developments.

## THE CAR RESERVE SYSTEM

The CAR reserve system in Tasmania comprises a variety of formal and informal reserves on Crown and private land. The degree of protection conferred by reservation varies between reserve classes. Some classes of reserves are available for mineral exploration and mining, subject to the requirements of Tasmania's Mineral Exploration Code of Practice (Bacon 1999). Other extractive land uses may also be permitted. For example, Tasmania's newest karst reserve – Prime Seal Island in Bass Strait – is a Conservation Area leased for grazing.

The Tasmanian Reserve Management Code of Practice establishes standards for reserve management in Tasmania (PWS et al. 2003). The Code contains a range of prescriptions concerning karst. These apply to all reserves managed by the Tasmanian Parks and Wildlife Service and Forest Reserves managed by Forestry Tasmania. The Code does not formally apply in the case of Protection forest, an informal class of reserve on State forest. Protection forest is an administrative form of reservation that can, within certain

constraints, be varied by Forestry Tasmania as a matter of internal policy.

Although forestry operations are sometimes characterised as a threat to karst systems in Tasmania, in the overwhelming majority of cases people entering caves are a more significant and immediate problem. This is particularly true on reserved land, which contains some of Tasmania's most degraded caves, due to the effects of excessive visitation and/or inappropriate behaviour by some visitors. In some circumstances, the creation of new reserves can put caves at risk, as in the case of formerly closed private caves that become available for public access following acquisition by the Crown. Caves in this situation are vulnerable to damage unless the land manager takes the necessary steps to manage access following transfer to public ownership.

Private land within the CAR reserve system includes private sanctuaries and private nature reserves gazetted under the Nature Conservation Act 2002, as well as private land subject to conservation covenants. A conservation covenant is an attachment to the land title that protects specified conservation values. The majority are perpetual covenants, which cannot be revoked without approval of the Tasmanian parliament. This is an increasingly important form of reservation in Tasmania, with some 601 properties totalling 76357 ha protected (November 2010). A range of incentives are available for landowners considering reservation, which is coordinated through the Tasmanian government's Private Land Conservation Program.

## DATA SOURCES

Whereas Eberhard (2007) provided a breakdown of reserved karst based on Kiernan's (1995) Category A-D system for characterising degree of known and potential karstification, the present paper summarises reservation levels based on broad lithological types. This approach facilitates assessing the degree to which the reserve system encapsulates the diversity of Tasmania's karstlands, of which lithology is a key control. For the sake of consistency, all rock units considered by Kiernan (1995) have been included (Table 1). Tasmania's best developed karst is associated with Ordovician limestones (Gordon Group) and Precambrian dolomites (Weld River Group etc.). The actual presence of karst within some other rock units listed at Table 1 is rare or unconfirmed in some cases; therefore, the data potentially overestimate the true extent of the karst estate. On the other hand, this factor will be partially offset because new outcrops of limestone and dolomite continue to be discovered. Some karst areas are yet to be incorporated in the karst layer (the karst layer used in this analysis is the same as that used in 2007).<sup>1</sup> Examples include areas of carbonate rock that have been found on the west coast, Gordon River, Picton Range and Furneaux Group. The karst layer is very much a work in progress and aspects of it are overdue for review (Sharples 2003).

<b>Lithology type</b>	<b>Area (ha)</b>
<b>Cenozoic limestones</b>	
Holocene freshwater limestone (eg, recent spring mound or tufa deposits)	11.19
Pleistocene aeolian calcarenite	28975.36
Pleistocene freshwater limestone (eg, Pulbeena Limestone)	106.62
Tertiary marine limestone undifferentiated	21268.68
Tertiary limestone over Smithton Dolomite (near Redpa)	95.74
Cenozoic (mostly Tertiary) freshwater limestone (eg, Geilston Bay deposits)	14.44
<b>SUBTOTAL</b>	<b>50472</b>
<b>Permo-Carboniferous limestones</b>	
Parameener Supergroup (undifferentiated)	21952.62
<b>Siluro-Devonian limestones</b>	
Eldon Group (undifferentiated)	30740.52
<b>Ordovician limestones</b>	
Gordon Group (undifferentiated)	135778.33
<b>Precambrian/Cambrian magnesite</b>	
Arthur Metamorphic Complex (magnesite and interbedded magnesite/dolomite)	384.83
<b>Precambrian/Cambrian carbonates (mostly dolomites)</b>	
Cambrian carbonate rocks (mainly dolomites) undifferentiated	21.86
Cambrian Ragged Basin Complex dolomites and cherty dolomites	367.42
Precambrian Black River Dolomite, Savage Dolomite, Success Creek Group & correlates	31137.41
Precambrian Clark Group dolomites	12581.57
Precambrian dolomites undifferentiated	2932.03
Precambrian Kanunnah Subgroup/Crimson Creek formation dolomitic and calcareous units	5952.35
Precambrian Oonah Formation, Burnie Formation and correlated interbedded dolomite/clastic sequences	25208.32
Precambrian Rocky Cape Group interbedded dolomites (Irby Siltstone ù interbedded clastics and dolomites)	2117.06
Precambrian Smithton Dolomite	52405.62
Precambrian Weld River Group dolomite, Jane Dolomite, Hastings Dolomite and correlates	42906.68
Precambrian/Cambrian Arthur Metamorphic Complex sequences (eg, Keith Schist) not known to contain magnesite units but stratigraphically correlated with dolomitic sequences such as the Oonah Formation	4045.34
<b>SUBTOTAL</b>	<b>179676</b>
<b>TOTAL</b>	<b>419004</b>

**Table 1.** Karstic and potentially karstic lithological types considered in this analysis, with area totals for Tasmania. Source data: Tasmanian Digital Karst Atlas v3.0.

Of the data presented in this paper, the GIS analysis of reservation levels for karst across Tasmania as a whole was undertaken in August 2008 using the latest Tasmanian Reserves Estate digital layer available at that time. Since then, new reserves have been created, classification of existing reserves altered and reserve boundaries changed. This must be taken into account in considering the currency of the findings. The analysis of reserved area at Mole Creek was undertaken in November 2010 using the latest Tasmanian Reserves Estate digital layer, but also taking account of the fact that 315 ha of former Conservation Area in that area was recently gazetted as National Park.

## RESULTS AND DISCUSSION

Reservation levels for karst in Tasmania are summarised at Table 2. The results are broadly commensurate with those obtained in 2007, although some differences are apparent. The following reserve categories show an apparent increase in reserved area: Regional Reserve,

Forest Reserve, Informal Reserve on Other Public Land and Private Property Conservation Covenant. The following reserve categories show an apparent decrease in reserved area: Conservation Area, Informal Reserve on State Forest and Other Private Reserve. Further work would be required to establish the extent these differences reflect real changes in reserved area of karst, taking into account that there has been no repeat of major government initiatives such as the Tasmania-Commonwealth Regional Forest Agreement (1997) or the Tasmanian Community Forest Agreement (2005), both of which resulted in substantial increases in the area of reserved land in Tasmania.

Mole Creek in particular has benefitted from various programs leading to the creation of new private reserves, reservation of hitherto unallocated Crown land and purchase of private land for conversion to Crown reserves. This is good news as Mole Creek has been dogged for many years by an inadequate reserve system and complex land tenure arrangements generally.

	Cenozoic limestones	Permo- Carboniferous limestones (Parameener Supergroup)	Siluro- Devonian limestones (Eldon Group)	Ordovician limestones (Gordon Group)	Precambrian/ Cambrian Magnesite (Arthur Metamorphic Complex)	etc Other Cambrian/ Precambrian carbonates (mainly dolomites)	TOTAL
Dedicated Reserves							
National Park	44	1669	2976	63535	0	52720	131491
State Reserve	31	19	0	47	0	417	792
Nature Reserve	61	0	0	40	0	96	197
Game Reserve	65	0	0	0	0	0	65
Historic Site	0.6	0	0	493	0	0	493
Wellington Park	0	47	0	0	0	0	47
Other Formal CAR Reserves							
Conservation Area	408	316	8160	4876	0	3329	17088
Regional Reserve	0	421	13461	4376	13	9335	27607
Nature Recreation Area	165	0	0	1820	0	1194	3178
Forest Reserve	0	273	50	2686	48	16296	19353
Informal CAR Reserves							
Informal Reserve on State Forest or Forestry Tas managed land	108	236	1188	5917	211	8775	16435
Informal Reserve on other public land	673	20	93	154	0	2484	3423
Private CAR Reserves							
Private Nature Reserve and Conservation Covenant	0	0	0	33	0	0	33
Private Sanctuary and Conservation Covenant	0	21	0	15	0	0	36
Conservation Covenant (NCA)	102	125	0	288	0	60	576
Management Agreement	0.3	1.9	0	0	0	0	2
Private land within WHA	0	0	0	242	0	473	715
Other Private Reserve	11	49	0	293	0	682	1035
<b>TOTAL</b>	<b>1947</b>	<b>3196</b>	<b>25928</b>	<b>84815</b>	<b>272</b>	<b>95862</b>	<b>222567</b>

**Table 2:** Reservation levels for karstic and potentially karstic lithological types in Tasmania (August 2008). NCA = Nature Conservation Act 2002.

Karst Area	Features included	Reserve Class*	Area (ha)	Year	Program+
Mole Creek	Herberts Pot	CA	68	2000	-
Gunns Plains	Gunns Plains Cave	CA	55.4	2003	NHT
Mole Creek	floodplain and terraces	CC	40.9	2003	PFRP
Mole Creek	Den Cave	CC	130.2	2003	PFRP
Mole Creek	caves and other karst features	CC	76.7	2003	PAPL
Mole Creek	White Rabbit Cave	CA	2.6	2003	NHT
Mole Creek	Westmorland Cave	CA	27.3	2003	NHT
Mole Creek	Westmorland Cave access	CL	0.5	2003	-
Mole Creek	Kubla Khan (Divers' Entrance)	CA	17.7	2003	NHT
Mole Creek	Mersey Hill Cave	NR	43.1	2004	PFRP
Mole Creek	Mersey Hill Cave catchment (part)	CA	17.6	2004	NHT
Mole Creek	streamsinks and caves	PS	39.3	2004	PAPL
Loongana	Mostyn Hardy Cave	PNR	51.1	2004	PFRP
Mole Creek	karst features	CC	17.1	2005	PFRP
Mole Creek	Sassafras Creek catchment (part)	CC	12.0	2005	PAPL
Mole Creek	caves and other karst features	CC	73.0	2008	PAPL
Mole Creek	Flyover-Hangover Cave	NP	17.3	2008	CLAC
Mole Creek	Baldocks Cave access	NP	16.8	2008	CLAC
Mole Creek	Georgies Hall	NP	41.3	2008	FCF
Mole Creek	caves and other karst features	NP	17.8	2008	FCF
Mole Creek	Circular Ponds	NP	203.8	2008	FCF
Mole Creek	Spider-Cow Cave	NP	52.3	2008	FCF
Mole Creek	Herberts Pot (entrance), Georgies Hall	NP	41.0	2008	FCF
Vale of Belvoir	subalpine karstland	CC	473.7	2008	TLC
Prime Seal Is.	Mannalargenna Cave	CA	1360	2010	CLAC

**Table 3:** Selected recent reserve additions on karst in Tasmania.

NCA = Nature Conservation Act 2002. Note: caves and reserves listed in this table are not necessarily available for access. \*Land tenure: Conservation Area (CA), Conservation Covenant on private land (CC), National Park (NP), Nature Reserve (NR), Private Nature Reserve (PNR), Private Sanctuary (PS). +Program: Protected Areas on Private Land (PAPL), Private Forest Reserves Program (PFRP), Natural Heritage Trust Priority 1 Karst Program (NHT), Forest Conservation Program (FCF), Tasmanian Land Conservancy (TLC), Crown Land Assessment Classification Project (CLAC)

Historically, many cave reserves at Mole Creek only partially encompassed the passages and entrances of the caves which they ostensibly protected. In 2003 there were at least 14 examples of major caves which contained passages and/or entrances extending outside of the relevant reserves, mostly into adjacent private land. Moreover, a depth limitation on land titles came into effect under Tasmanian law in the early 20th century, adding further complexity to an already complex situation. The implication is that the Crown is responsible for cave passages below a certain depth underlying private land,

depending on the age of the title. Conversely, landowners with older titles legally own the land at the surface and to the very centre of the earth, including any cave passages within it.

From the early 1990s onwards, some Mole Creek landowners, including some holding title to unreserved portions of cross-tenure caves, applied to harvest timber or develop plantations on their land. Some were prevented from doing so due to constraints on logging karst under Tasmania's forest practices system. This caused considerable stress and bad feeling amongst some affected

landowners, which found expression in various ways including threats to damage the karst system. At the same time, sections of the community have become alarmed about the health implications of plantation development in the vicinity of Mole Creek's water catchment. The situation was, in short, a perfect dog's breakfast.

Progress has been made towards resolving some of these difficulties, principally through purchase of private land for reservation under various State and Commonwealth initiatives (Table 3). Figure 1 shows the current extent of reserves at Mole Creek; Table 4 provides a breakdown in terms of land tenure. Some 25% of the karst in the greater Mole Creek area is now protected in some form of reserve. Contiguous reserved forest now links up many formerly isolated reserves and extends from the Great Western Tiers to the Mersey River at several points.

On a more equivocal note, Forestry Tasmania has changed the zoning status of a sizeable area of State forest on the western portion of the Mole Creek karst area. A number of caves are affected, including Croesus Cave, Lynds Cave, Tailender Cave, Rat Hole, Shooting Star Cave, Little Trimmer Cave and Execution Pot. The area in question includes the Mill-Kansas catchment, the subject of an agreement between Forestry Tasmania and the Parks and Wildlife Service known as the Mill-Kansas Joint Management

Protocol. The purpose of the agreement is to facilitate a complimentary approach to cave management by the two agencies. It has provided a framework for managing access to cross-tenure caves and actively managing otherwise neglected caves on State forest since July 2000. At that time the Mill-Kansas catchment was zoned Conditional forest, which acknowledged special circumstances relating to karst values. The status of the Mill-Kansas Joint Protocol in the light of Forestry Tasmania's decision to alter the zoning is unclear.

All former Conditional forest in the Mill-Kansas catchment has now been allocated to either the Production or Protection forest zones. In addition, former Production forest on the limestone hill immediately west of Marakoopa Cave (containing Execution Pot and Little Trimmer Cave) has been re-zoned as Protection forest. The net result of the various changes is that the bulk of State forest directly underlain by limestone in the Mole Creek area is formally or informally reserved. Former Conditional forest in the vicinity of Urks Loop Rd is now classified as Production forest, while the zoning status of Production forest on parts of Solomons Dome and Standard Hill is unchanged. With minor exceptions these Production forest areas are not directly underlain by limestone, although they are a source of runoff that supplies limestone cave systems downslope, including Lynds Cave and Kubla Khan Cave.

Land tenure classification	Area (ha)
Reserved land	
National Park	890
Nature Reserve	40
State Reserve	10
Regional Reserve	134
Conservation Area	700
Forest Reserve	581
Informal Reserve on State Forest or Forestry Tas managed land	914
Informal reserve on other public land	37
Private Sanctuary and Conservation Covenant (NCA)	15
Other Private Reserve	35
Conservation Covenant (NCA)	345
Subtotal	3701
Un-reserved land	
Private land	6668
Other State forest	247
Other land	4070
Subtotal	10985

**Table 4:** Land classification on limestone in the greater Mole Creek area (November 2010)<sup>2</sup>.

## CONCLUDING REMARKS

This paper presents the results of an updated analysis of reservation levels for karst in Tasmania. Some 53% of carbonate rocks identified as karstic or potentially karstic are reserved, mostly in formal Crown reserves. The most comprehensively reserved rock unit considered in the analysis is the Siluro-Devonian limestones (Eldon Group), of which 84% are reserved (in fact these rocks are not highly karstic). Some 62% of the generally well-karstified Ordovician limestones (Gordon Group) are reserved, again mostly in formal Crown reserves. The least well reserved group is the Cenozoic limestones, of which less than 4% are reserved.

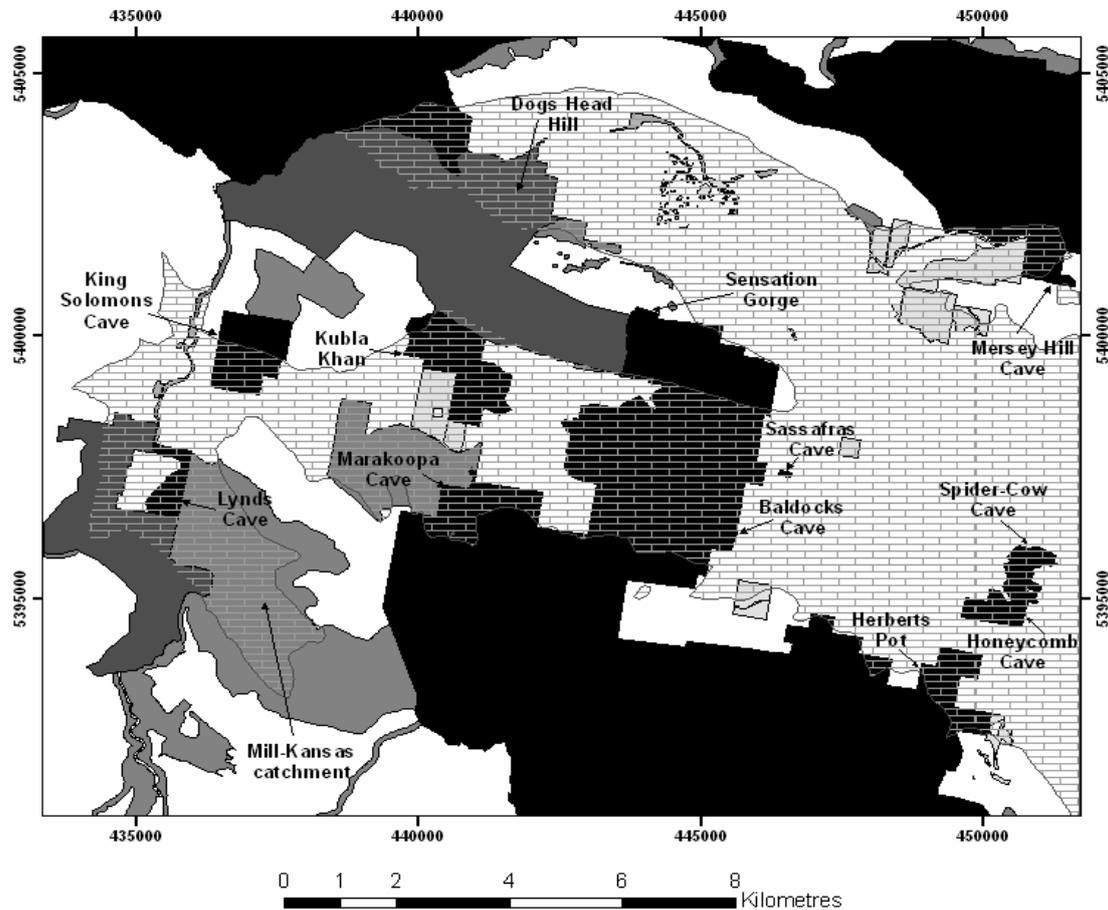
While acknowledging that more of Tasmania's karst estate is reserved than at any time in the past, the devil is in the detail and some critical gaps are still outstanding. It is outside the scope of this paper to review these gaps in a systematic way, but from a karst perspective it is important that they are considered in future initiatives involving land reservation in Tasmania. In the past this has not always been the case, with reservations often driven primarily by concern for wilderness and biodiversity values. To the extent that karst (and broader geodiversity) was captured in reserves established under programs such as the RFA, it could be argued that this was more-or-less a fortuitous bycatch to an agenda driven by other priorities. On the other hand, the subsequent Forest Conservation Fund explicitly

targeted karst on private land for purchase and reservation.

Parties involved in a process presently underway in Tasmania to resolve conflict over native forests have agreed a Statement of Principles which provides for the progressive implementation of a

moratorium on the logging of high conservation forests. Underpinning the process is an intention to a phase out of native forest logging in favour of plantation forestry, which itself engenders new environmental pressures. The full implications of these developments for karst are unclear at this stage but likely very significant.

### CAR Reserves at Mole Creek



#### Legend

##### Tas Reserve Estate

- Forest Reserve
- Informal Reserve on State Forest or Forestry Tas managed land
- Informal reserve on other public land
- Parks & Wildlife Service Reserve
- Private Land Reserve

Limestone



Data Source and map production: NRM Liaison and Information Management Section, Land Conservation Branch, DPI/PWE

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