Appendix 3 – Mount Fyans Southern Bent-wing Bat (SBWB) Survey

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Mount Fyans Southern Bent-wing Bat (SBWB) survey

Supplementary report

Version	Date	Author
V0	21 August 2018	Gavin Thomas
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ECOLOGICAL CONSULTANT

Supplementary report

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Background

In 2012, Biosis was commissioned by Hydro Tasmania to undertake a flora and fauna assessment of the proposed Mount Fyans Wind Farm site for the purposes of describing the existing ecological conditions. The final consultant's report entitled *Mount Fyans Wind Farm: Flora and fauna existing conditions*[1], was provided to Hydro Tasmania in February 2017.

In the aforementioned report, the Southern Bent-wing Bat (SBWB; *Miniopterus orianae bassanii*) was listed among a group of EPBC and FFG fauna species and/or habitat as potentially occurring within or around the study area, as determined by the desktop study. The flora and fauna survey, along with historical information obtained during the desktop study, triggered the need for a targeted assessment of all potential SBWB habitat within and surrounding the proposed wind farm site.

A targeted assessment of potential SBWB habitat was carried out during September 2013 and the survey findings were included in the report entitled *Mount Fyans Wind Farm: Targeted surveys and impact assessment*[2]. The final version of this report was presented to Hydro Tasmania in April 2017.

As co-author of both above-mentioned reports, I have been engaged by Hydro Tasmania to provide supplementary information clarifying our assessment of potential SBWB habitat, with a focus on the Mondibili cone located on the Down Ampney property. Our previous conclusions regarding the potential habitat at the Mondibili cone 'as not providing suitable cave habitat for a major SBWB roost' have been questioned by the Department of Land, Water, Environment and Planning (DELWP) as part of the preparation of a SBWB assessment for the Mt Fyans Wind Farm project.

This supplementary report provides information and clarification regarding:

- the SBWB survey methodology, and
- justification for the assessment of the Mondibili cone as not providing suitable cave habitat for a major SBWB roost.

[1]Biosis 2017. Mount Fyans Wind Farm: Flora and fauna existing conditions. Report for Hydro Tasmania. Authors: Gibson, M., Arber, S., Thomas, G., & Cable, T., Byrne, A. & Venosta, M. Biosis Pty Ltd, Ballarat. Project no. 14369.

[2] Biosis 2017. Mount Fyans Wind Farm: Targeted flora and fauna survey report. Report for Hydro Tasmania. Authors: Gibson, M., Arber, S., Thomas, G., & Cable, T., Byrne, A. & Venosta, M. & Sofo, K. Biosis Pty Ltd, Ballarat. Project no. 14369.

Mount Fyans SBWB targeted survey

Survey field personnel

Biosis engaged three staff to conduct the fieldwork associated with the SBWB survey:

- Gavin Thomas (author of this report)
- Ken Grimes (deceased), and
- Janeen Samuel (provided technical surface support).

In my capacity of Consultant Zoologist, I (Gavin Thomas) was engaged to undertake the Mount Fyans SBWB survey due to my prior experience conducting SBWB surveys in the local area - such as the Byaduk caves, as well as other ecological assessments across the proposed Mount Fyans Wind Farm study area.

The late Ken Grimes was engaged to assist with the SBWB survey due to his extensive knowledge of the cave systems in the SBWB survey area, and prior involvement in assisting with ecological projects involving bats. Ken was recommended to Biosis by Dr Lindy Lumsden a key expert on the ecology of bats with the Victorian State Government. Ken was a geologist, geomorphologist and speleologist with more than 25 years' experience investigating and mapping south western Victoria basalt and limestone cave systems. Ken was also a prolific author of original scientific research articles for local and international peer-reviewed journals on a variety of speleological-related topics. A bibliography is provided as an appendix to this report that outlines Ken's work in Western Victoria.

Ken and I conducted fieldwork together on the Mount Fyans SBWB survey to undertake structural assessments of cave systems within and around the wind farm survey area, with the focus on identifying suitable SBWB roost sites. Prior to this, I had worked with Ken at the Byaduk cave system where we assessed and observed active SBWB roost sites over several years. These assessments included entry and exit counts, internal activity surveys, harp trapping, video surveys and acoustic surveys.

Survey scope and purpose

The above-listed personnel undertook a detailed speleological investigation of potential SBWB roost sites within and around the proposed Mount Fyans Wind Farm site, located in south western regional Victoria.

We recognised that a few individual SBWB may roost sporadically in a range of potential habitat features within and around the proposed Mount Fyans Wind Farm site. We were tasked, however with identifying sites that had the potential

to form a major roost site containing tens of individual SBWB, roosting infrequently over multiple years. Our initial survey effort was refined to focus the targeted surveys on structures that were considered to have the potential as a major roost site. Other than the presence of bats, major roost sites were considered likely to be identifiable through direct evidence of historical occupation, including guano and/or skeletal remains.

The purpose of this investigation was to provide detailed physical evidence and structural information about three volcanic landscape features to ascertain the presence or absence of historic and/or current occupation by SBWB.

During this investigation, Biosis surveyed three volcanic landscape features to assess their suitability as potential major roost sites, including:

- Mount Fyans,
- Mount Hamilton, and
- Mondibili cone on the property of Down Ampney.

There are a number of lava caves in south western Victoria, some of which are known to support roosting and overwintering SBWBs. The above-listed potential SBWB major roosting sites within and around the proposed Mount Fyans Wind Farm site were selected based on Ken's extensive speleological experience of the local area coupled with my prior experience conducting general and targeted fauna (including SBWB) surveys on the study site.

Since the Mondibili cone is the focus of this supplementary report, the Mount Fyans and Mount Hamilton sites will not be considered further.

Mondibili cone site survey

The Mondibili cone, located on the Down Ampney property, is typical of many cinder cones in south western Victoria. This comparatively small cone is several hundred metres in diameter and has a small quarry on the lower south-western flank. The face of the quarry is comprised entirely of highly-weathered scoria, while the summit of the cone is dominated by blocks of vertically and sub-vertically jointed basalt. Weathering of the crest has produced some wider joints that are larger in more exposed situations.

On the 5th of September, Ken and I spent a total of four hours surveying the entire breadth of the Mondibili cone to identify any openings and overhangs that may be suitable for more detailed investigation. We observed several small overhangs near the summit of the cone and on the eastern flank, however these overhangs were not typical of SBWB roosting habitat due to their small size and limited lateral extent. We also observed several openings on the southern flank of the cone, however these cavities were too small to be entered by us and it was clear from the surface that they did not extend inwards for any distance, nor did they develop into a larger chamber. We were able to

determine the spatial extent of these small openings using a handheld high-powered LED torch.

During the survey, we also observed one potentially larger cavity on the southern slope of the cone. This opening was a sub-horizontal cavity (i.e. angled downwards) with an opening of between 25–30 cm in diameter. Although the size of the opening did not allow entry into the cavity to conduct further survey work, we were able to observe the internal space using a handheld high-powered LED torch. Ken and I independently made our internal observations and agreed that the estimated cavity extended inwards approximately one metre. We also agreed that there was no indication that the cavity opened up laterally in any one direction.

In addition, we found no geological evidence in the face of the quarry that indicated the presence of basalt, and therefore rock with the potential to produce cavities large enough to potentially host a major SBWB roost site.

The basalt at the summit and on the northern flank of the cone contains a variety of different sized jointed basalt blocks and columns. We fully investigated all observable surface joints and fissures and all were found to be very narrow, pinching out towards their base with no observable cavities. We considered that the majority of joints and fissures would represent poor or unsuitable potential major roost sites due to a combination of their small size, shape and location. All joints and fissures observed provided poor protection from predators and/or the elements and had insufficient or unsuitable access. All joints and fissures were examined for evidence of current or historical use by SBWB.

In addition, all isolated rocky outcrops and loose boulders on the summit and flanks of the cone that were found to contain fractures were investigated and all were considered to be unsuitable as potential SBWB roost sites.

Any joints or fissures that may provide suitable habitat as a major roost were assessed with high-powered LED torches to examine current or historical use.

At no time while conducting surveys of the Mondibili cone did we observe any evidence of roosting bats, nor did we find any evidence of guano or skeletal remains to suggest any historical usage by bats.

This targeted survey and reporting process included an assessment of whether any additional observation methods should be recommended to the client to assist in identifying a major SBWB roost.

Ken and I considered that any further assessment of the Mondibili Cone was highly unlikely to provide any additional scientific evidence to indicate a major roost site for SBWB.

Review of SBWB Major Roost Sites

Prior to undertaking the field survey Ken prepared a short report on known caves that had reports of bats or may be a major roost for SBWB.

All known large major roost sites in Victoria's volcanic plains were in caves formed by lava tubes. No scoria cone volcanoes have been identified as having a cavity that is used as a major roost site.

Ken's report recognised that 'bats use caves that have entrances that are too small for humans to enter and the size of the entrance is no guide to the extent of the underground cavity'.

From this report, and my work with Ken on site, I believe he was aware of the need to assess the presence of underground cavities and did not base his findings on the size or appearance of entrances.

Conclusion

Based on the observations made during the site assessment, Ken and I agreed unanimously that the structural features of the Mondibili cone:

1. did not provide any fissures or joints in basalt that indicated current or historical use as a major SBWB roost, and;
2. did not provide any cavities or openings considered suitable habitat for a major SBWB roost site.

This conclusion was informed by Ken's extensive knowledge of cave systems and geomorphology of the local area, coupled with my experience in conducting SBWB habitat and activity surveys.

Appendix: Ken George Grimes Bibliography

Ken Grimes was an accomplished geologist with over 40 years' experience in the field. He held a national profile and was known and respected by his colleagues across Australia having 59 technical reports, articles and conference papers on ResearchGate the online professional network for scientists and researchers[3]. He had a lifelong passion for the outdoors and caving as demonstrated by his extensive catalogue of work and many organisational and academic affiliations.

[3] https://www.researchgate.net/profile/Ken_Grimes

Ken studied geology and geomorphology at the University of Queensland on a cadetship from the Queensland Department of Mines and graduated with a BSc (Hons) in 1968. From May 1968 to November 1990 Ken worked as a Geologist in the Regional Mapping Section of the Geological Survey of Queensland after which he moved to Western Victoria to work as a private geomorphologist consultant until December 2014.

Notable Academic works -

Grimes, K.G., White, S., & Pierce, M. (1994) Limestone caves of Southeast South Australia and western Victoria. Australian Caver 137: pp 7-14.

Grimes, Ken. (1995) Lava caves and channels at Mount Eccles, Victoria.

Grimes, Ken & Mott, Kevin & White, Susan. (1999) The Gambier Karst Province. 10.13140/2.1.1532.8648.

Webb, J., Grimes, K. & Osborne, A. (2003) Black Holes: caves in the Australian landscape.

Grimes, Ken G. (2005) The Volcanic Plains of Western Victoria, Hamilton Field Naturalists Club.

Grimes, Ken. (2006) A small cave in a basalt dyke, Mt. Fyans, Victoria, Australia. Helictite. 39. 17-20.

Grimes, Ken. (2008) Small Subcrustal Drainage Lava Caves; examples from Victoria, Australia. 35-44.

Associations and Awards -

Edie Smith Award in 2009 from the Australian Speleological Federation “for outstanding service to Australian speleology over a long period of time”

Fellow of the Australasian Cave & Karst Management Association

Honorary Research Fellow at the La Trobe University

Australian Speleological Federation convenor of the Surveying and Mapping Standards Commission and Queensland co-ordinator of the Australian Karst Index for the period 1975-1991

Co-editor of Helictite, the Journal of Australasian Speleological Research, since 1999

Member of the Hamilton Field Naturalists Club (HFNC) for 25 years during which time he served for 15 years as Treasurer