



**Jim's Plain & Robbins Island**  
Renewable Energy Parks

## **Robbins Island Renewable Energy Park**

### **Appendix E**

### **Bat Utilisation Survey**

*UPC Robbins Island Pty Ltd*

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# **UPC Robbins Island Pty Ltd**

## **Robbins Island Renewable Energy Park Approvals Bat Utilisation Survey**

July 2018

# Executive Summary

This report presents the findings of a bat utilisation survey undertaken by GHD Pty Ltd for UPC Robbins Island Pty Ltd between 30 January and 11 February 2018. Bat call surveys, using Anabat SD2 detectors, were undertaken at four sites in the proposed Robbins Island Renewable Energy Park site.

No threatened bat species, listed under State or Commonwealth legislation, were identified. The most commonly recorded and active bat species / species-complex identified was the widespread and common Gould's wattled bat (*Chalinolobus gouldii*). This species is the most commonly identified bat impacted by wind farms in Tasmania, comprising the majority of bat fatalities recorded at the nearby Woolnorth wind farm.

Consistent with past surveys of Robbins Island, bat activity was relatively low compared to mainland Tasmania. A total of 573 bat call sequences were recorded across 12 nights. Of the sites surveyed, bat activity was greatest at Teal Lagoon and varied nightly and between species.

The relatively low bat activity recorded on Robbins Island, combined with lack of roosting habitat in the survey area, suggests that the sites surveyed do not represent important habitat for bats compared to other areas within Tasmania, which include national parks and conservation areas.

No further surveys are recommended at this stage in the development.

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# 1. Introduction

UPC Robbins Island Pty Ltd (UPC) are proposing the development of the Robbins Island Renewable Energy Park (the Project) on Robbins Island in north-west Tasmania. As part of the State approval process, bat utilisation surveys are required to be undertaken at the site, as specified in the Project Specific Guidelines issued for the Project from the Tasmanian Environmental Protection Authority (EPA). GHD Pty Ltd were engaged by UPC to undertake the baseline bat surveys.

## 1.1 Background

Wind farms are recognised as a threatening development to microchiropteran bats as a result of traumatic injury following collisions with moving turbines and possibly barotrauma (Baerwald et al. 2008; Kunz et al. 2007). Bat fatalities have been recorded at a range of wind farms on and off-shore in North America, Europe and Australia (Hull and Cawthen 2013; Kunz et al. 2007; Rydell et al. 2010a). Post-construction carcass surveys have found that bat species most at risk of fatalities at wind farms are those that roost in trees, migrate and/or are high-flying open-air foragers (Cryan and Barclay 2009).

Tasmania has eight species of tree roosting microchiropteran bats, including one endemic (Driessen et al. 2011; Koch et al. 2008). None are listed as threatened under State or Commonwealth legislation. Two of these species however are high-flying open-air foragers and are therefore considered at risk of wind farm fatalities: The Eastern falsistrelle (*Falsistrellus tasmaniensis*) and the Gould's wattled bat (*Chalinolobus gouldii*) (O'Neill and Taylor 1986). In Tasmania, only one of these species has been found during post-wind farm development carcass surveys, namely the Gould's wattled bat. Forest bats (*Vespadelus* spp.) have also been recorded during carcass surveys, but their risk of fatality is considered low because they do not regularly fly at height (Hull and Cawthen 2012). Two vagrant bat species are also at risk of fatality at wind farms. These are the White-striped freetail bat (*Austronomus australis*), which has been recorded in northern and south-eastern Tasmania (Cawthen 2013), and the grey-headed flying fox, which has been recorded in northern and southern Tasmania (Driessen 2010). The latter is listed as vulnerable under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.

Robbins Island has been surveyed twice for bats in the Autumn of 2004 and Summer of 2009 (Brett Lane and Associates 2010). Across four sites, five bat species / species complex were recorded. These were the Eastern falsistrelle (*Falsistrellus tasmaniensis*), long-eared bat (*Nyctophilus* spp.), large forest bat (*Vespadelus darlingtoni*), little forest bat (*Vespadelus vulturnus*) and Gould's wattled bat (*Chalinolobus gouldii*). Gould's wattled bats were recorded at three of the four survey sites, and were the most commonly recorded species. Overall, however, few calls were recorded across the two previous surveys, with a total of 25 calls recorded across 16 nights. Part of this work also included a survey at height to sample bat activity at the blade height of a wind turbine (Brett Lane and Associates 2010). All previous sampling of bats on the island indicates bat activity is relatively low on Robbins Island compared to mainland Tasmania (Cawthen 2014).

Bat fatalities at wind farms can occur throughout the year, though at Tasmania's Bluff Point and Studland Bay wind farm, the majority of fatalities have been recorded in late Summer / Autumn, coinciding with the bat mating season (Hull and Cawthen 2012). Similar findings have been found in North America and Western Europe and it is thought that this reflects increased risk of fatalities as a result of changes in flight behaviour and habitat use during migration and mating periods (Arnett et al. 2008; Cryan 2008; Rydell et al. 2010b). In North America, bat fatalities

have also been documented to a lesser extent in spring and summer and have included pregnant individuals (Arnett et al. 2008). It is unclear whether the number of, and patterns in, bat fatalities reflect pre-development bat utilisation of a site or whether bats are attracted to newly created habitat post-development.

## **1.2 Project Location and Survey Area**

Robbins Island is approximately 9900 ha in size and is located approximately 1 km off the north-west coast of Tasmania. The island is not permanently inhabited and is used primarily as cattle grazing pasture.

The island has only one permanent freshwater body, known as Teal Lagoon, located on the western coast of the island. The island's vegetation is predominately coastal heathland, with small patches of *Eucalyptus nitida* dry forest and woodland, as well as *Eucalyptus obliqua*. The latter is largely fire damaged from a fire in 2008 (North Barker Ecosystem Services 2018)

## **1.3 Purpose of this Report**

The aim of this report was to provide a baseline assessment of the bat utilisation of the proposed Robbins Island Renewable Energy Park site, and provide recommendations on how to mitigate the likely impacts of the proposed development on bats that utilise the site.

## **1.4 Scope and Limitations**

This report: has been prepared by GHD Pty Ltd (GHD) for UPC Robbins Island Pty Ltd and may only be used and relied on by UPC Renewables for the purpose agreed between GHD and UPC Renewables as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than UPC Robbins Island Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report;

GHD has prepared this report on the basis of information provided by UPC Robbins Island Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information. The opinions, conclusions and any recommendations in this report are based on conditions encountered, observations made and information reviewed at the date of preparation of the report. Due to the fact that GHD was only present at specific points within the relevant site(s) on specific dates and certain time periods, this report is only indicative (and not definitive) of bat utilisation on the site(s). Bat utilisation (whether in species or activity), can also change and fluctuate at different times throughout the year (due to factors including seasonal changes or external events), where it is not possible to observe such changes or fluctuations where only discrete site(s) visits have taken place. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

## 2. Methodology

### 2.1 Desktop Assessment

Roosting habitat assessments were conducted using the Forest Practices Authority 'Habitat Context Assessment Tool' which predicts the availability of mature forest habitat (containing hollow-bearing trees) in a pre-defined area (Forest Practices Authority. 2011). As bats roost and breed in areas of the highest hollow-bearing tree availability, this tool can identify potential important roosting and breeding habitat in an area. This was followed up by an on foot assessment of potential roosting habitat during field surveys.

### 2.2 Site Selection

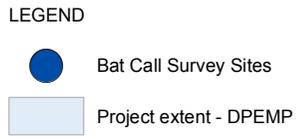
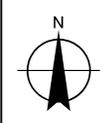
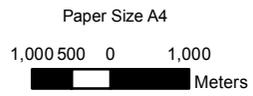
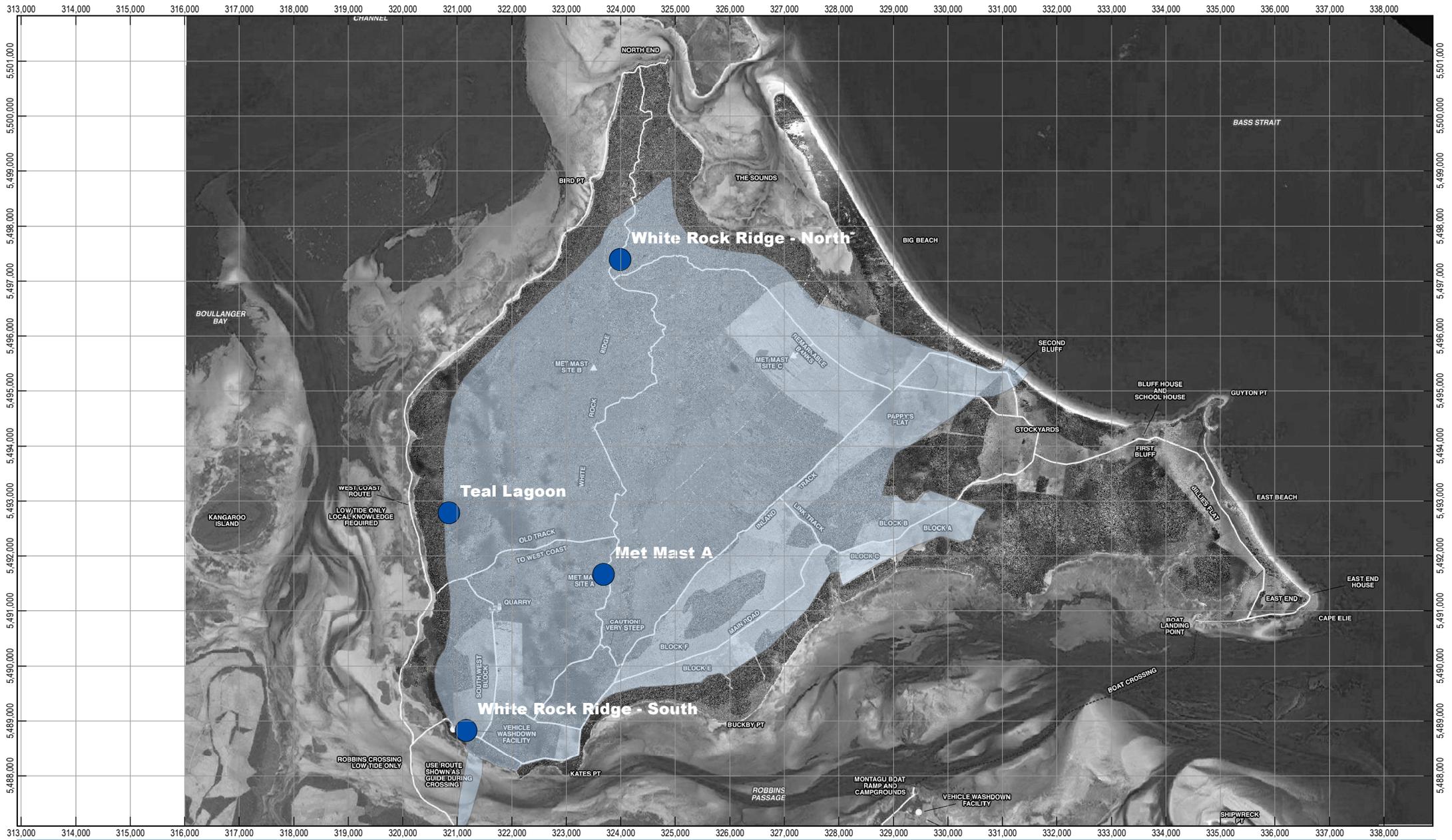
Four survey sites were selected representing a range of habitats within the development area, as detailed below in Figure 2 and Table 1.

### 2.3 Bat Call Surveys

Bat call surveys were used to identify bat species presence and relative activity patterns on Robbins Island between 30 January and 11 February 2018. This was undertaken using four bat call survey stations, set 1.5 metres above the ground using Anabat SD2, bat detectors.

Post-deployment, the files recorded by Anabats were identified as containing bat call sequences (a series of calls produced by a bat contained within a 15 second Anabat file) which were then identified to species and species complexes using Analook. Species complexes (a genus, or two or more species) were used during identification because not all bat call sequences can be identified to species level. This is because not all species exhibit marked variation in their call attributes (e.g. *Nyctophilus* spp.) and because some species overlap in their call attributes for particular suites of calls (e.g. *Vespadelus darlingtoni* - *regulus*). Poor quality bat call sequences (e.g. due to noise) or a low number of quality bat calls in a sequence can also prevent accurate identification to species level and such calls may be identified as unknowns but included in the overall measure of bat activity. Foraging calls were also identified.

Bat call sequences were processed in Analook and identified using a Tasmanian bat species key developed (Cawthen 2015). The key was developed using reference calls collected throughout Tasmania (n=12,004). This key includes a sub-key for low frequency calls between 10 and 15 kHz in the known range of *A. australis* (Churchill 2009). Identifications were only made when a minimum of 50% of bat calls within a sequence were identified to the same species/species complex and only sequences with a minimum of three calls were identified to a species/species complex. If neither of these specifications were met, the sequence was identified as an unknown.



UPC Renewables  
Bat Utilisation Survey

Bat Survey Sites

Job Number 321858801  
Revision A  
Date 04 May 2018

**Figure 1**

**Table 1 Robbins Island Bat Utilisation Survey Site Description**

Survey Site	Description
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Met Mast A</p> 	<p>Dominated by short coastal heathland, this site represented one of the highest points on the island off White Rock Ridge.</p> <p>This site was surrounded by suitable foraging habitat, with no potential roost sites identified.</p> <p>This site was also sampled by Brett Lane and Associates during previous bat surveys so was also chosen for comparative purposes.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">White Rock Ridge – North</p> 	<p>Dominated by tall coastal heathland, this site was located on the northern end of White Rock Ridge.</p> <p>This site was surrounded by suitable foraging habitat, with a scattering of small <i>E. nitida</i> providing possible roost sites under bark.</p> <p>As the northern most survey site, this site was closest to potential roosting habitat at Mosquito Inlet.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">White Rock Ridge – South</p> 	<p>This site was a mix of coastal heathland and <i>Leptospermum glaucescens</i> at the southern end of White Rock Ridge adjacent Robbins passage.</p> <p>The site was surrounded by suitable foraging habitat, with some potential roost sites under the bark of <i>E. nitida</i>.</p> <p>As the southern-most point on the island, with the shortest distance to mainland Tasmania, this site also represents potential transitory habitat of bats on and off the island.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Teal Lagoon</p> 	<p>Dominated by a mix of freshwater sedgeland and rushland, as well as <i>E. nitida</i> dry forest and woodland, this site represented the only permanent freshwater source on the island.</p> <p>This site provided optimal foraging and drinking habitat, with potential roost sites under the bark and in hollows of nearby trees.</p>

## 3. Results

### 3.1 Bat Call Surveys

A total of 573 bat call sequences were recorded across 12 survey nights. Of these, 73% could be accurately identified to a bat species / species-complex.

#### 3.1.1 Species Presence

Four groups of bats were identified – Gould’s wattled bat (*Chalinolobus gouldii*), Gould’s wattled bat - Eastern Falsistrelle species complex (*Falsistrellus tasmaniensis*), long-eared bat (*Nyctophilus* spp.) and forest bat (*Vespadelus* spp.) (Table 2).

The most commonly recorded bat call sequences were Gould’s wattled bat, followed by the Gould’s wattled bat (*Chalinolobus gouldii*) - Eastern Falsistrelle (*Falsistrellus tasmaniensis*) species complex. Combined, these bat call sequences, identifying high-flying open air foragers, comprised 40% of the calls identified.

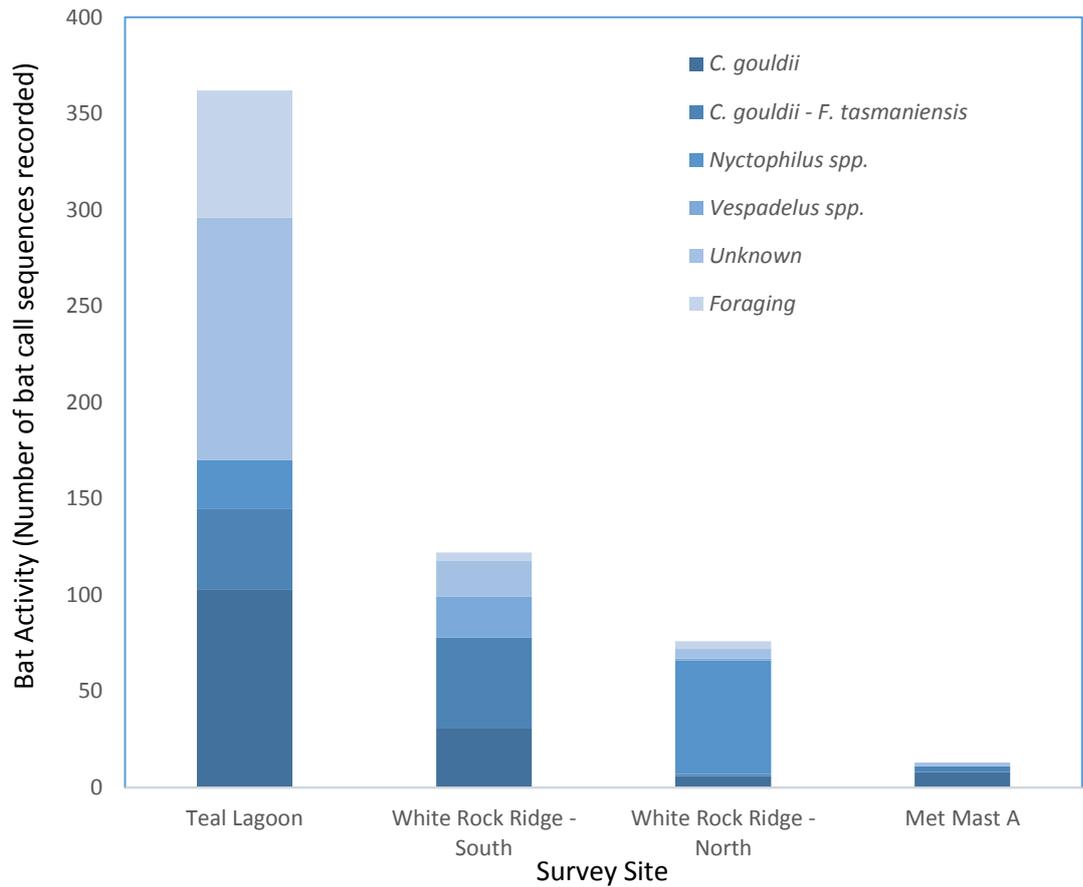
**Table 2 Bat activity and species / species-complex (including foraging calls) recorded across 12 nights at the proposed Robbins Island Renewable Energy Park**

Bat Species Species/Complex	Number of bat call sequences identified (% of total)	Survey Sites Recorded
Gould’s wattled bat ( <i>Chalinolobus gouldii</i> ),	148 (24%)	All sites
Gould’s wattled bat ( <i>Chalinolobus gouldii</i> ) - Eastern Falsistrelle ( <i>Falsistrellus tasmaniensis</i> )	93 (16%)	All sites
Long-eared bat ( <i>Nyctophilus</i> spp.)	84 (16%)	White Rock Ridge – North & Teal Lagoon
Forest bat ( <i>Vespadelus</i> spp.)	22 (4%)	White Rock Ridge – North and Met Mast A
Unknown	152 (27%)	All sites
Foraging calls	74 (13%)	All sites except Met Mast A

#### 3.1.2 Bat Activity Patterns Across the Site

Overall bat activity varied across the site (Figure 2). Bat activity was greatest at Teal Lagoon (30 bat call sequences per night) followed by White Rock Ridge- South (12 bat call sequences per night), White Rock Ridge-North and Teal Lagoon (both 4 bat call sequences per night). The higher number of bat call sequences recorded in any one night was 51 at Teal Lagoon. Teal Lagoon also recorded the highest number of foraging calls, with 89% of foraging calls recorded here.

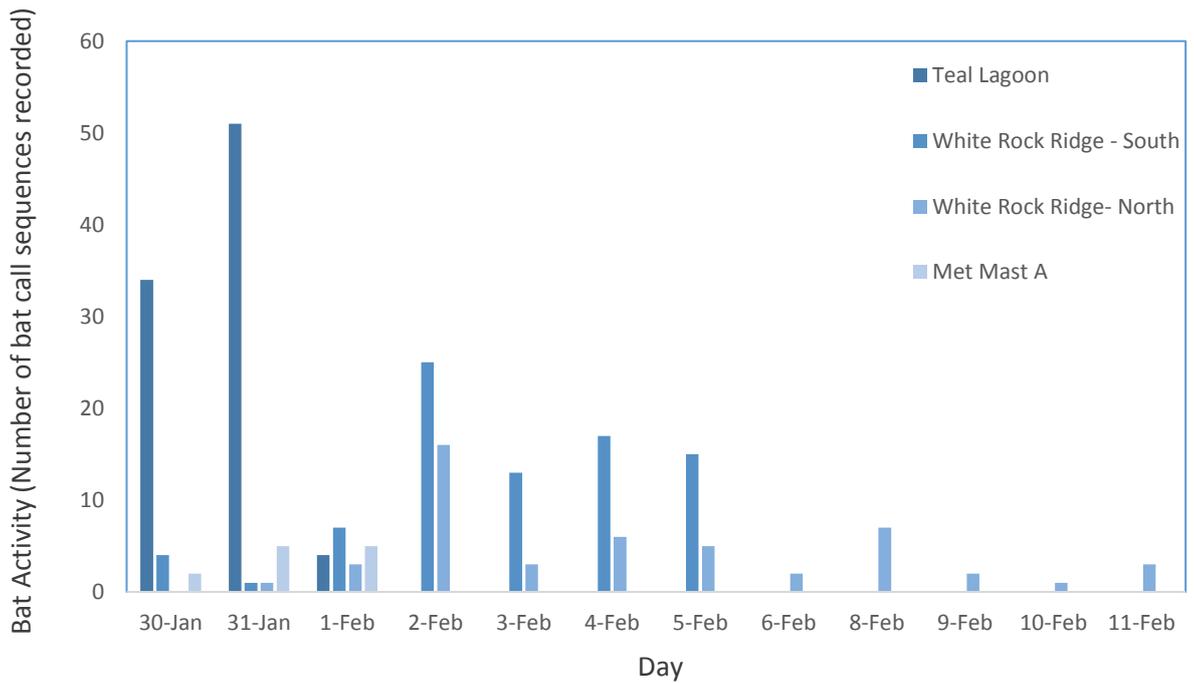
Activity by high flying bat species, recorded as *C.gouldii* and *C.gouldii* – *F. tasmaniensis*, was also greatest at Teal Lagoon, followed by White Rock Ridge – South. Relatively little activity was recorded at White Rock Ridge-North and Met Mast A for these bat species / species-complex. In contrast, a high proportion of long-eared bat calls (*Nyctophilus* spp.) were recorded at White Rock Ridge-North compared to the other sites.



**Figure 2 Composition of bat species / species-complex activity (including foraging calls) recorded across 12 nights at the Robbins Island Renewable Energy Park**

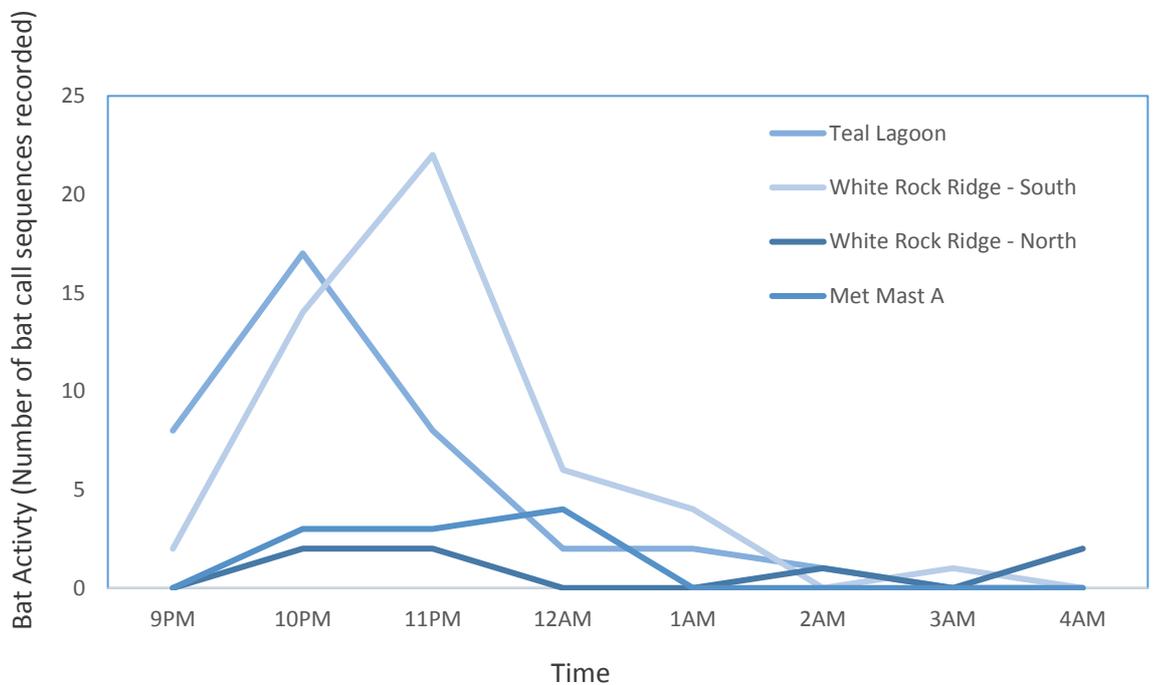
### 3.1.3 Timing of Bat Activity

Bat activity varied across the duration of the survey, and between sites. Bat activity was consistently recorded at White Rock Ridge-North, but varied nightly at all other sites (Figure 3).



**Figure 3 Bat activity recorded across 12 nights at the Robbins Island Renewable Energy Park**

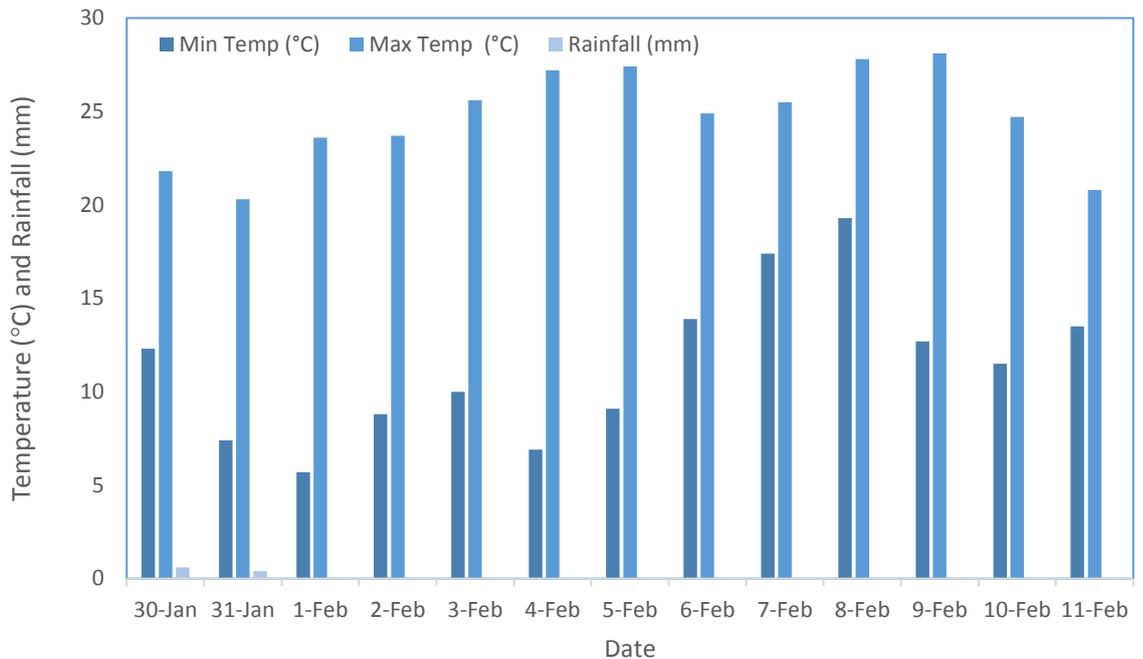
Activity by high flying bat species, recorded as *C.gouldii* and *C.gouldii – F. tasmaniensis*, was greatest at White Rock Ridge-South and Teal Lagoon between 10 – 12 pm each night. Relatively little activity occurred at White Rock Ridge-North and Met Mast A (Figure 4).



**Figure 4 High flying species bat activity throughout the night at the Robbins Island Renewable Energy Park**

### 3.2 Weather Conditions

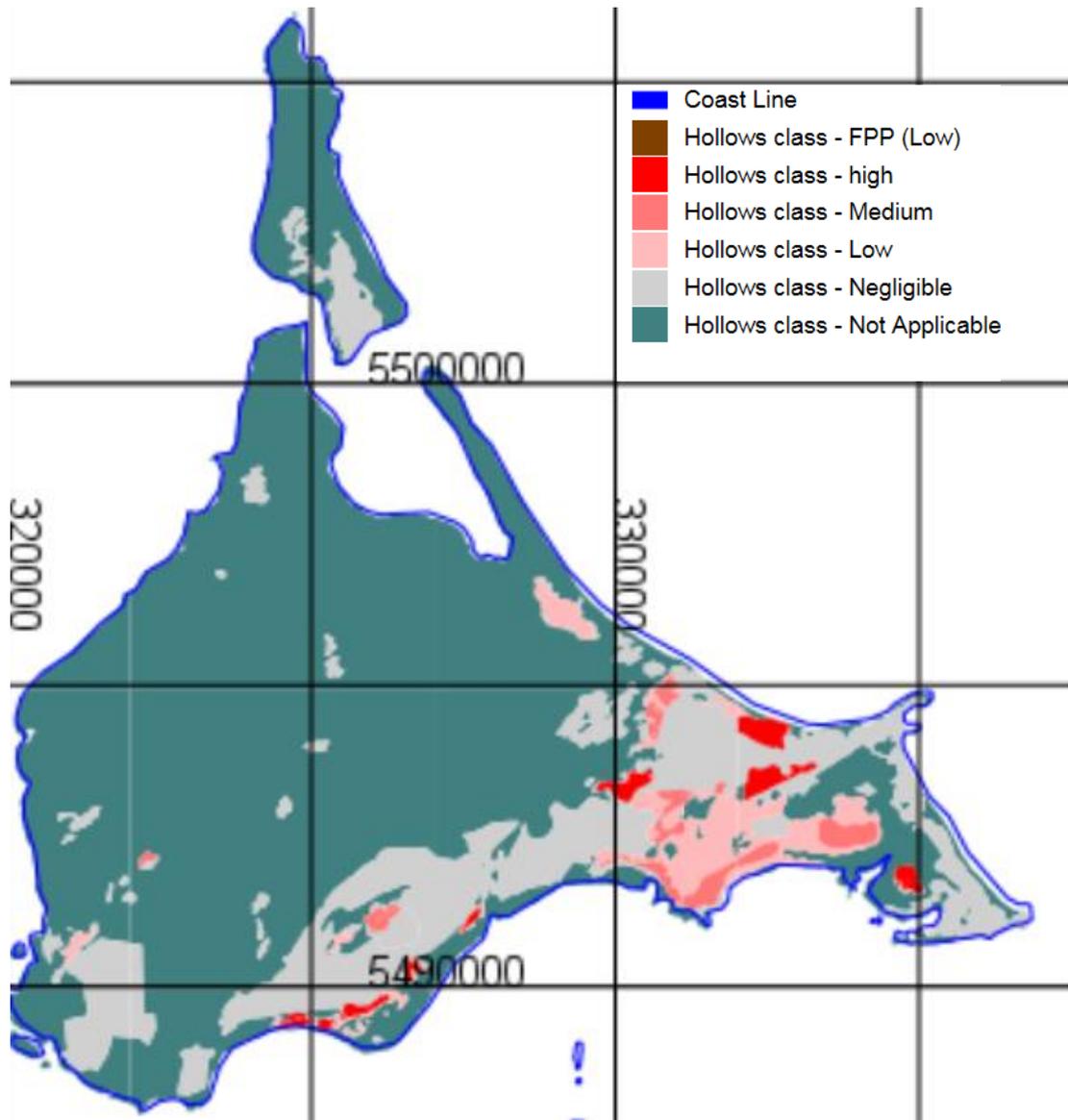
The Bureau of Meteorology (BoM) Smithton Aerodrome Station (091292) is approximately 13 km south-east of Robbins Island and is the nearest weather station with continuous data covering the survey period. Only two days of light rain were recorded during the survey. Temperatures were warm during the day and varied nightly (Figure 5). None of the survey conditions were considered prohibitive for detecting bat activity during a bat utilisation survey.



**Figure 5 Weather conditions during the Bat Utilisation Survey (Smithton Aerodrome Station, BOM, 2018)**

### 3.3 Roosting Habitat Assessment

Desktop assessment of the availability of mature forest habitat (containing hollow-bearing trees) on site predicted that the majority of mature habitat is located outside of the proposed development area on the north-east coast of the island (Figure 6). On-ground surveys confirmed there was very little mature forest habitat, containing hollow-bearing trees, in the proposed development area. Substantial habitat was located on the north-west area of the island at Mosquito Inlet, and in the form of isolated hollow-bearing trees located in paddocks on the eastern side of the development area.



**Figure 6 Predicted mature habitat availability map of Robbins Island. (Forest Practices Authority., 2016)**

## 4. Conclusions

### 4.1 Summary of Bat Utilisation across the Site

No threatened bat species listed under State or Commonwealth legislation were recorded in the proposed Project area during this or previous surveys. Gould's wattled bats (*Chalinolobus gouldii*), which are known to be impacted by wind turbines at the adjacent mainland Bluff Point and Studland Bay wind farms (Hull and Cawthen 2013), were the most commonly recorded species on site.

Bat utilisation of the proposed wind farm site, including by Gould's wattled bats, was greatest at Teal Lagoon. Teal Lagoon comprises an extensive area of aquatic habitat that likely provides bats with foraging and drinking habitat, as well as surrounding woodland that provides potential roost sites. Such habitat is likely to support relatively high bat activity compared to other areas on the island.

Other sites, particularly to the north and south of White Rock Ridge also provide habitat for bats, but far less than Teal Lagoon. White Rock Ridge-South was utilised by high flying bats to a much greater extent than White Rock Ridge-North and Met Mast A area. White Rock Ridge-South is adjacent to Robbins Passage, which likely provides bats with ample foraging habitat along the coast and at low tide, as well as transitory habitat to mainland Tasmania.

Gould's wattled bats are one of the most commonly recorded bat species in Tasmania (Cawthen 2014) and comprise at least 70% of the recorded bat fatalities at Bluff Point and Studland Bay wind farms (Hull and Cawthen 2013). At the adjacent operating wind farms on mainland Tasmania, bats are active year round, with Gould's wattled bats peaking in their activity in May and December (Woolnorth Wind Farm Holding 2017). This peak in bat activity does not necessarily correspond to bat fatalities at adjacent operating wind farms, which peak between late summer and autumn (Hull and Cawthen 2013). This suggests that seasonal patterns in behaviour may influence bat fatality risk at wind farms in north-west Tasmania, in addition to activity patterns, for the Gould's wattled bat. By surveying in late summer, this study has provided baseline information on the activity patterns of bats during periods of peak fatality risk.

There is no information available on the bat activity numbers at Bluff Point and Studland Bay wind farm to compare with Robbins Island to predict bat fatality risk based on this bat utilisation study. Compared to other sites where Gould's wattled bats are present in Tasmania, bat activity each night was relatively low at Robbins Island. It is not uncommon to record 300+ bat call sequences per night for Gould's wattled bats at an individual recording station in areas of optimal foraging or roosting habitat (Cawthen 2014), whereas less than 25 bat call sequences were recorded per night at Robbins Island. This suggests that the sites surveyed at Robbins Island do not support high bat activity, and therefore do not represent important habitat for Gould's wattled bats as a species compared to other areas within its Tasmanian range which include national parks and conservation areas.

### 4.2 Mitigation Considerations

At the time of writing, this report the final proposed layout of windfarm infrastructure on Robbins Island was not yet known. This report, therefore, focuses on baseline data for the development area, not specific turbine locations

Potential mitigation and monitoring measures to reduce the impact of the proposed wind farm on bats may include:

- When determining turbine locations, where possible establish exclusion zones around areas where bat activity is greatest (i.e. Teal Lagoon) and potential roosting sites (i.e. Mosquito Inlet).
- To limit impacts to bats, where possible retain and protect freshwater sources that provide drinking and foraging habitat as well as forest/woodland that contains hollows and exfoliating bark (which provides bat roosting habitat). Such habitat is best retained in one large patch and/ or strip rather than several small patches to provide optimal bat habitat.
- The bat breeding season is generally October to January and avoiding clearance in optimal habitat (e.g. Teal Lagoon) during this time, where possible, will help to limit overall impact to bats.
- During the operation phase, undertake regular monitoring of the wind farm development to measure the actual impacts of the wind farm on bats utilising the site (e.g. possible bat fatalities). If bat fatalities do occur further investigation and mitigation is likely to be required.

Further recommendations and mitigation measures may be developed once the proposed windfarm layout is confirmed.

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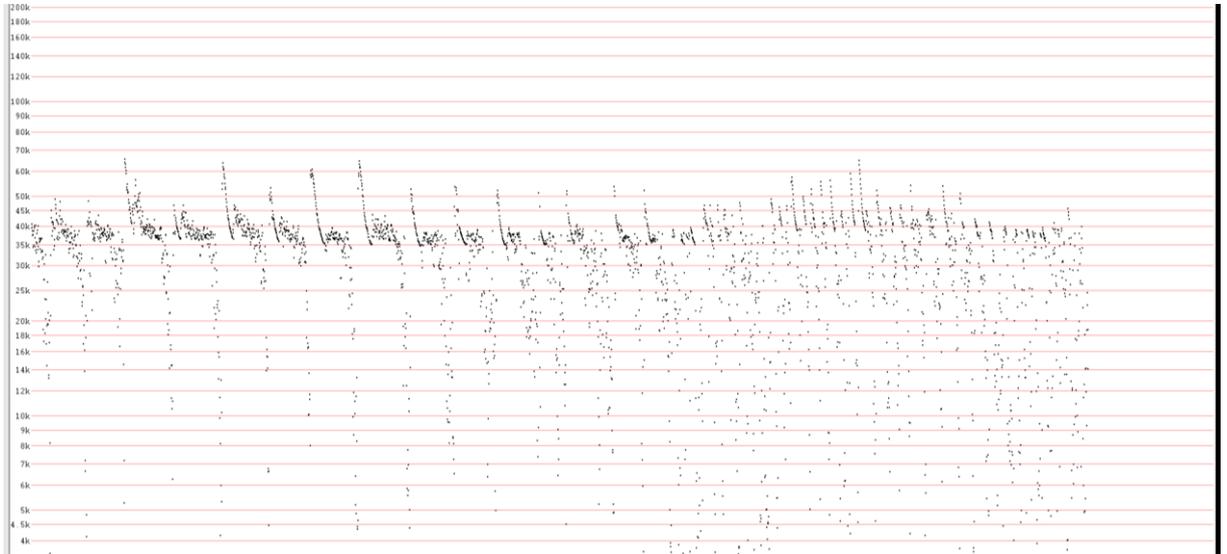
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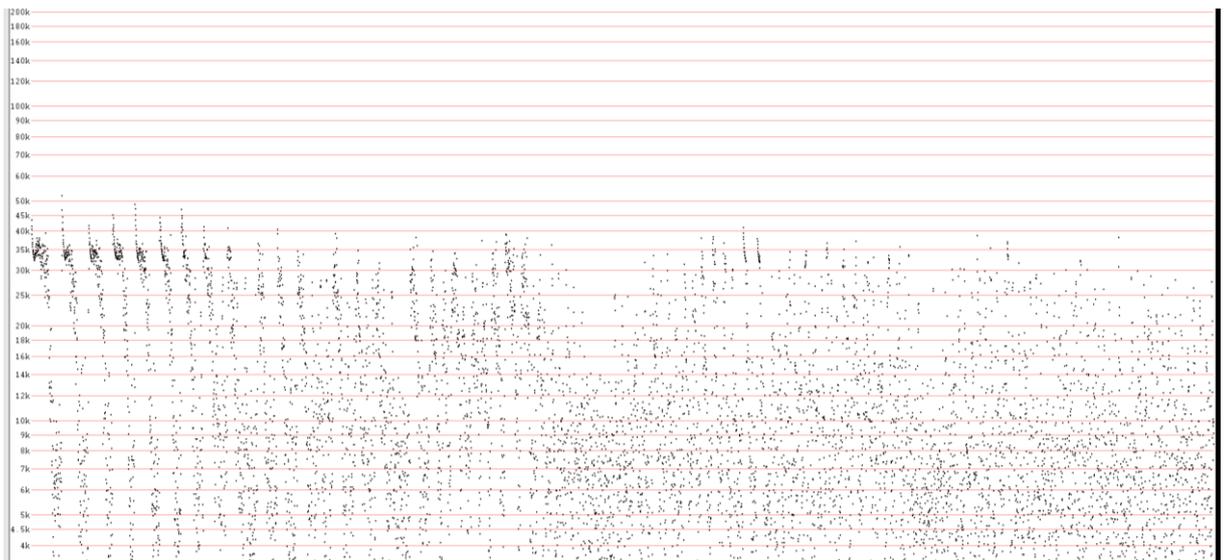
# Appendices

# Appendix A Example of bat call sequences recorded

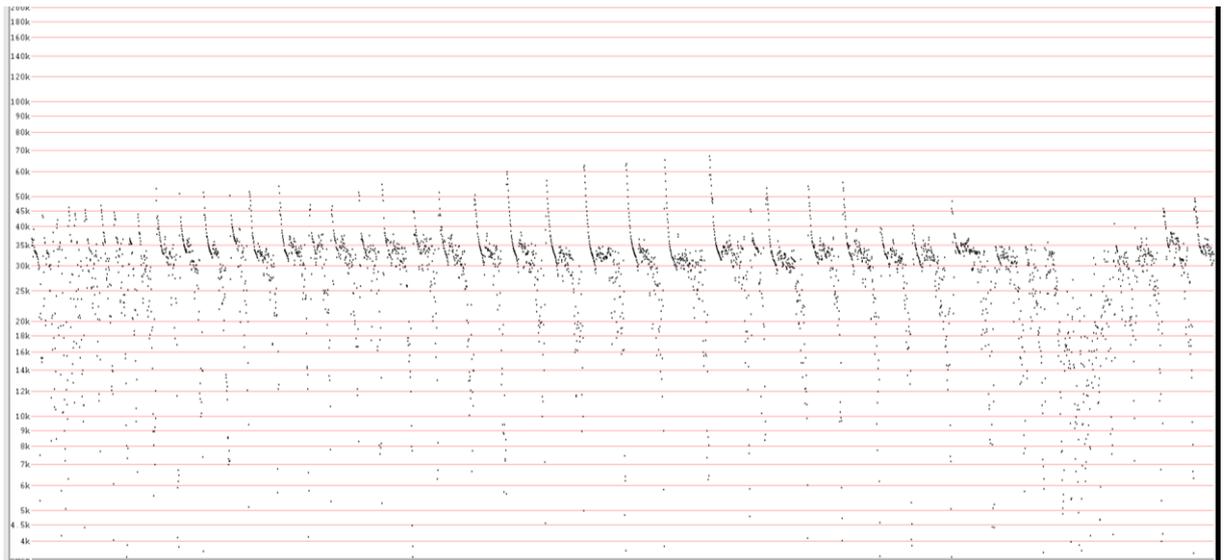
## Foraging calls



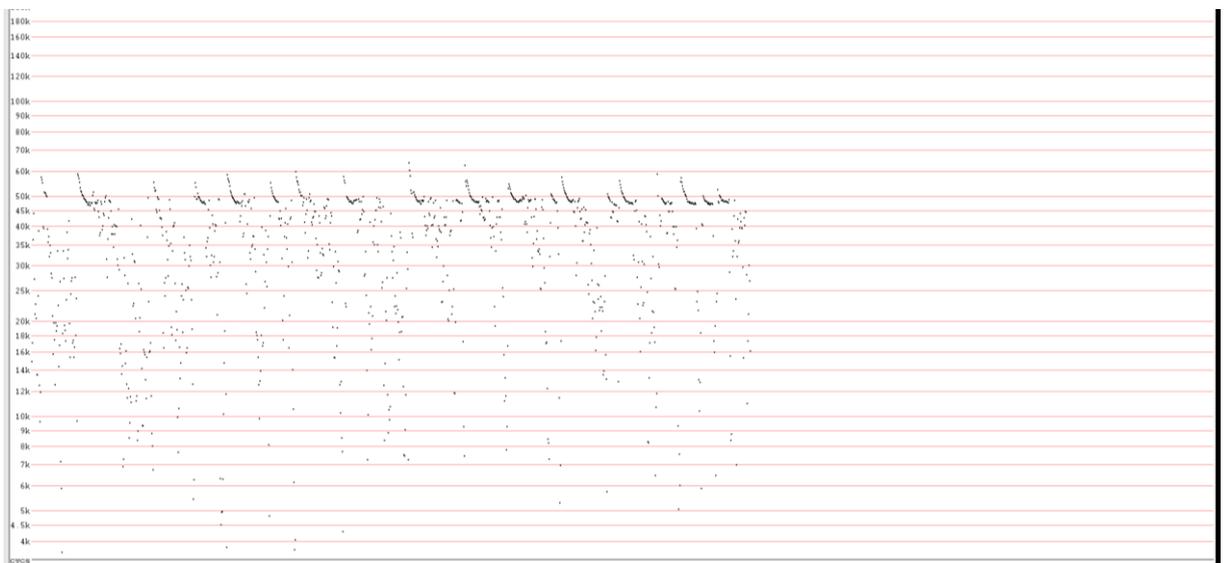
## Gould's wattled bat (*Chalinolobus gouldii*), - Eastern falsistrelle (*Falsistrellus tasmaniensis*)



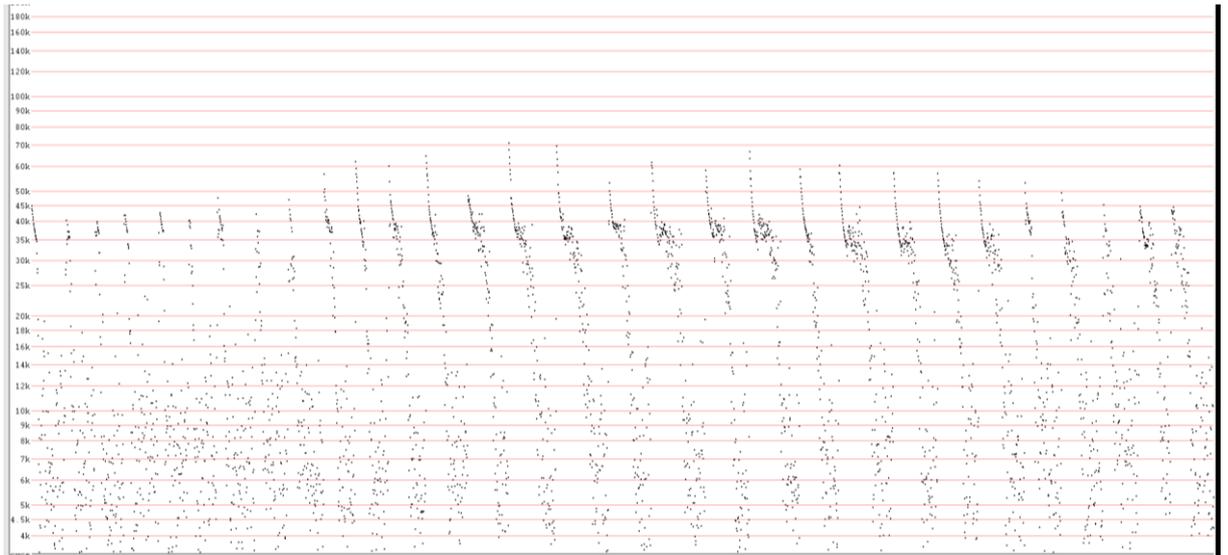
**Gould's wattled bat (*Chalinolobus gouldii*)**



**Forest bat (*Vespadelus spp.*)**



**Long-eared bat (*Nyctophilus spp.*)**



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24049/[https://projects.ghd.com/oc/Tasmania/robbinsislandrenewab/Delivery/Documents/UPC Robbins Island Pty Ltd\\_Bat Utilisation Survey\\_Jan 2018.docx](https://projects.ghd.com/oc/Tasmania/robbinsislandrenewab/Delivery/Documents/UPC%20Robbins%20Island%20Pty%20Ltd_Bat%20Utilisation%20Survey_Jan%202018.docx)

#### Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
RevA	Lisa Cawthen	Dan Elson	DRAFT	Anahita Jungalwalla	DRAFT	22/05/2018
Rev0	Lisa Cawthen	Dan Elson		Matt Davis		10/01/2019

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