

INVESTIGATION REPORT

HIGH DENSITY RECORDING OF GREATER GLIDERS (*Petauroides volans*)

BACK SWAMP CREEK #01

VicForests' scheduled and proposed logging coupes:

892-507-0020, 892-507-0021 (scheduled);

892-507-0014, 892-507-0023 (proposed)

Abstract

Forest areas within and/or adjacent to VicForests proposed logging coupe 892-507-0020 (and surrounding scheduled and proposed coupes) were investigated to assess the presence and density of Greater Glider (*Petauroides volans*) individuals and other nocturnal fauna.

High numbers of Greater Glider (*Petauroides volans*) individuals were recorded from this location within a nocturnal spotlighting survey.

The locations of the Greater Gliders (*Petauroides volans*) recorded within this investigation were assessed using Geographic Information Systems (GIS) software which demonstrated that the forest areas surveyed supported "high densities of Greater Glider" requiring protection under the relevant mandatory biodiversity conservation measures set out in the regulatory framework governing logging operations in Victoria's State Forests.

Recommendations are made to the Department of Environment, Land, Water and Planning (DELWP) and to VicForests to ensure that the areas of high Greater Glider (*Petauroides volans*) densities are protected from logging through their inclusion in the "Special Protection Zone" of the "Forest Management Zone Scheme". The methodology, results, discussion and recommendations arising from this investigation are further detailed within this report.

Relevant Legislation

- Code of Practice for Timber Production 2014, Department of Environment and Primary Industries, The State of Victoria, 2014
- "Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014", Department of Environment and Primary Industries, The State of Victoria, 2014
- "Planning Standards for timber harvesting operations in Victoria's State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014", Department of Environment and Primary Industries, The State of Victoria, 2014
- Forest Management Plan For The East Gippsland Forest Management Area, Victoria Department of Conservation and Natural Resources, East Melbourne, December 1995

Organisations involved

- VicForests

Status of Site

Coupe 892-507-0020 and 892-507-0026 are "in progress" and 892-507-0021 is "taped" out in preparation for imminent logging.

Date of Investigation

10-11/03/2018

Surveyors

Andrew Lincoln
Owen Hanson
Jake Mckenzie
Haley Forster

Authors

Andrew Lincoln
Fauna and Flora Research Collective Inc.
asl80@hotmail.com

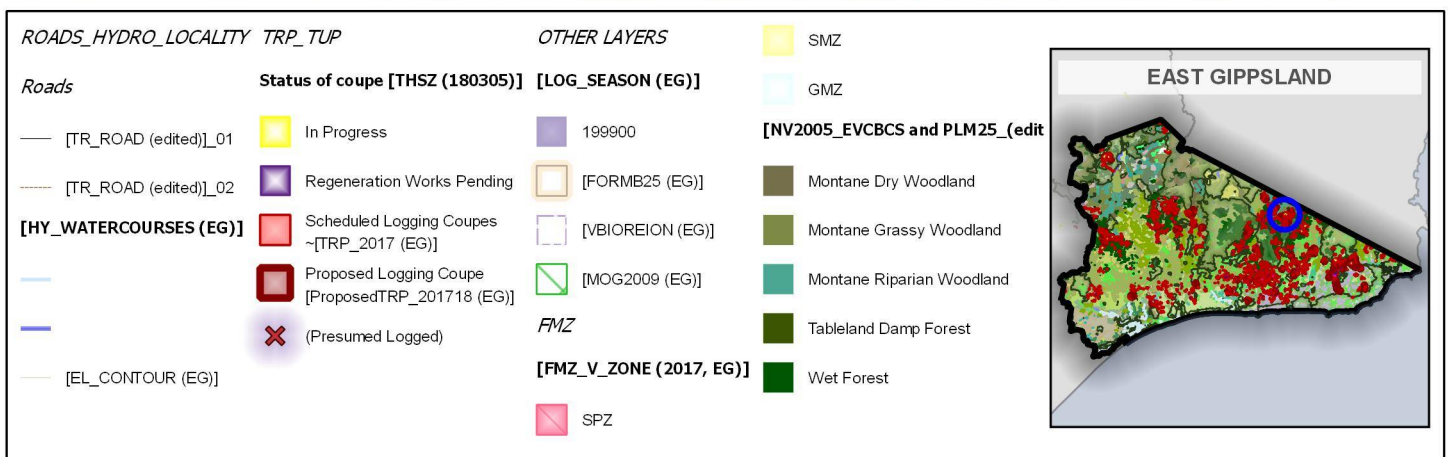
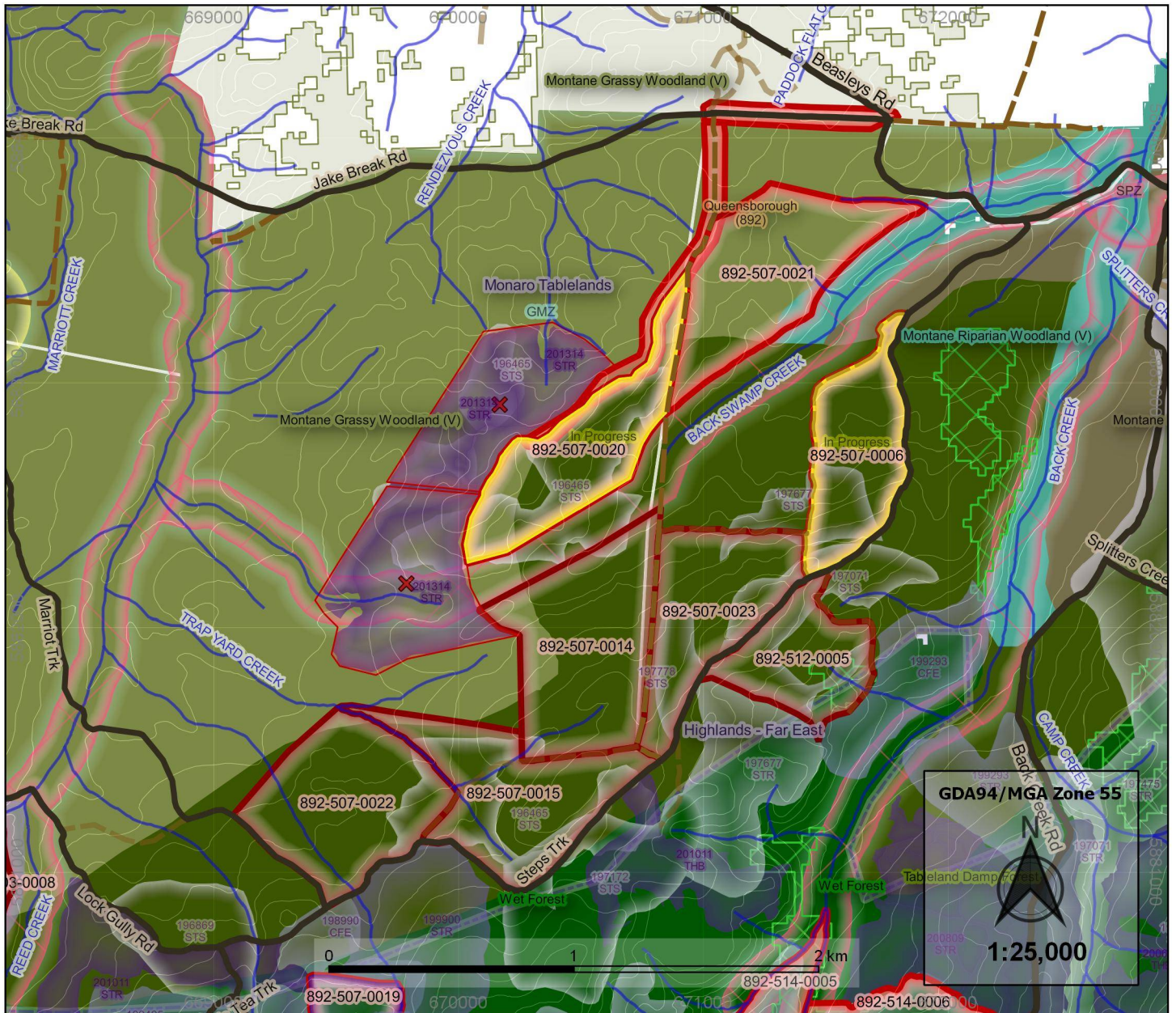
Date of report

14/03/2018

Ed Hill
Goongerah Environment Centre
geco@geco.org.au

Investigation Location Overview

Figure A. Investigation location: VicForests logging coupe 892-507-0021 north of Steps Track in the Queensborough Forest Blocks of East Gippsland ("East Gippsland FMA") ~5km South-east of Bendoc.



Method 1 (Nocturnal Fauna Spotlighting Survey)

Nocturnal Fauna Survey [10-11/03/2018]

Equipment Used

- Hand-held Spotlight
- Binoculars
- Digital Video Camera
- Global Positioning System (GPS)
[Garmin GPS]
- Compass, pen and paper

Method - General

1. On 10 and 11 March 2018 spotlighting surveys were commenced around the initial locations and times listed in the Table of the Results 2. section to the north of Steps Track in the Queensborough Forest Block.
2. Parts of the forest within and adjacent to these areas were searched for the presence of nocturnal fauna principally by shining a hand-held spotlight to detect fauna movement or “eye shine”.
3. As Greater Gliders were observed their locations were marked with a GPS and time, species, bearing from recording location, an estimate of the distance from observation location were noted and where possible video footage or photographs were taken.

(NB: where distance is recorded as "N/A" or 0, location coordinates of fauna species were recorded at or beneath the fauna location.)

See the Tables in “Results 2” below for details of the fauna encountered.

4. Fauna record location data were analysed using Geographic Information Systems (GIS) mapping software to determine compliance requirements with the regulatory framework governing logging operations in Victoria's State Forest with respect to fauna detection based biodiversity conservation measures.
5. Further presentation of these results, as well as conclusions and discussion arising from this investigations results are provided in their relevant sections below.

Method 2 (analysis/recommendations/legislation considered)

From: “Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014”, Department of Environment and Primary Industries, The State of Victoria, 2014.¹

“2. Planning and Record Keeping

2.1 FMZ and planning information

2.1.1.3 Where evidence of a value that requires protection via the establishment or amendment of an SPZ or SMZ is found in the field application must be made to the Secretary or delegate prior to commencement of the timber harvesting operation to create or amend an SPZ or SMZ in accordance with Appendix 5 the Planning Standards. SMZ applications must be accompanied by an SMZ plan and must be complied with during timber harvesting operations.

4. Biodiversity

4.2 Fauna

4.2.1.1 Apply management actions for rare and threatened fauna identified within areas affected by timber harvesting operations as outlined in Appendix 3 Table 13 (Rare or threatened fauna prescriptions).

Table 13 Rare or threatened fauna and invertebrate prescriptions.

FMA	Common name	Scientific name	Management action
East Gippsland	Greater Glider	<i>Petauroides volans</i>	Where evidence of this value is found in the field follow clause 2.1.1.3 of this document using table 4 in Appendix 5 the Planning Standards for information.

From: “Planning Standards for timber harvesting operations in Victoria’s State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014”²

“4. Biodiversity

4.2 Fauna – fixed zoning

4.2.1 Statewide

4.2.1.1 Plan management actions for rare and endangered fauna in accordance with Table 3 (Fixed FMZ rules for fauna) below.

4.2.1.2 Maintain FMZ schemes for rare and endangered fauna in accordance with Table 3 (Fixed FMZ rules for fauna) below.

4.3 Fauna - detection based zoning

4.3.1 Statewide

4.3.1.1 Apply the management actions outlined in Table 4 (Detection based FMZ rules for fauna) below for zoned rare or threatened fauna.

4.3.1.2 Implement FMZ amendments and reviews in accordance with Table 4 (Detection based FMZ rules for fauna) below for new verified rare or threatened fauna records and FMZ amendment requirements outlined in section 2.

Table 4 Detection based FMZ rules for fauna.

FMA	Common name	Scientific name	Zoning management actions	Management actions	Review
East Gippsland	Greater Glider	<i>Petauroides volans</i>	Establish a SPZ of approximately 100 ha of suitable habitat where verified records report more than 2 individuals per hectare, more than 10 individuals per km or more than 15 individuals per hour of spotlighting, or where substantial populations are located in isolated or unusual habitat.		

1 “Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014”, Department of Environment and Primary Industries, The State of Victoria, 2014, p. 23, 32, 36, 76, 79

2 “Planning Standards for timber harvesting operations in Victoria’s State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014”, Department of Environment and Primary Industries, The State of Victoria, 2014, pp. 16, 17, 20, 43

From: "Forest Management Plan For The East Gippsland Forest Management Area, Victoria Department of Conservation and Natural Resources, East Melbourne, December 1995".³

"Chapter 3 BIODIVERSITY CONSERVATION

3.4 - NATIVE FAUNA

CONSERVATION GUIDELINE Mammals

Arboreal mammals. For each of the following occurrences, approximately 100 ha of suitable habitat will be included in the SPZ:

- resident Koala populations.
- Greater Glider and Common Brushtail Possum - >2 individuals per ha, >10 per km, or >15 per hour of spotlighting.
- Yellow-bellied Glider - >0.2 per ha, >5 per km, or >7 per hour of spotlighting.
- Eastern Pygmy Possum - >5 per standard pitfall line over 5 days.
- substantial populations of the above species that are isolated or in unusual habitat.



³ Forest Management Plan For The East Gippsland Forest Management Area, Victoria Department of Conservation and Natural Resources, East Melbourne, December 1995, p. 12, 27, 29, 30

Results 1 (Summary – Nocturnal Spotlighting Survey Results)

Results 2 (Tables)

This section shows a Table that presents the summarised results from the spotlighting survey undertaken within the study location.

Results 3 (Maps)

Following the table detailed above are two maps (Figures 1-2.) displaying the Greater Glider detection records detailed in Results 2. Also shown is the location of the “High Density of Greater Glider” configurations formed by the relevant Greater Glider records detailed below.

In Figure 1. 11 Greater Glider records are shown as the uniquely labelled "dark blue pentagons". These 11 Greater Glider records were present within a 5.42ha polygon area. In Figure 2. the 11 Greater Glider records are shown along a 1003.64m line connecting the locations where each of the 11 Greater Gliders were recorded.

Results 4 (Images)

Following the maps are a series of still images taken from video footage captured of the Greater Gliders listed in Table 1. These images are labelled according to the “Waypoint id” and “Video file id” columns within the table.



mountain brushtail possum observed during survey

Results 2 (Tables)

Table 1. 10-11 March 2018_Nocturnal Fauna Spotlighting Records

Time	Way-point id.	Recording Location	Species	Common Name	Type	Bearing	Distance	Projected Animal Location	Video file id.	Selected unique individuals (Cumulative GG Tally)
10/03 20:33	ST01	55 H 670742 5881612	<i>Petauroides volans</i>	Greater Glider	Visual	300°	30m	55H 670716 5881627	ST01_vid	
10/03 20:46	ST02	55 H 670798 5881667	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670798 5881667	ST02_vid	
10/03 20:48	ST03	55 H 670809 5881689	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670809 5881689	ST03_vid	
10/03 20:53	ST04	55 H 670728 5881601	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670728 5881601	ST04_vid	
10/03 20:59	ST05	55 H 670863 5881747	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670863 5881747	ST05_vid	
10/03 21:21	ST06	55 H 670819 5882606	<i>Petauroides volans</i>	Greater Glider	Visual	340°	30m	55H 670809 5882634	ST06_vid	
10/03 21:31	ST07	55 H 670837 5882708	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670837 5882708	ST07_vid	
10/03 22:40	ST08	55 H 670631 5882482	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670631 5882482	ST08_vid	
10/03 22:52	SX01	55 H 670521 5882464	<i>Petauroides volans</i>	Greater Glider	Visual	160°	20m	55H 670528 5882445	-	
10/03 22:58	ST09	55 H 670351 5882545	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670351 5882545	ST09_vid	
10/03 22:59	SX02	55 H 670461 5882456	<i>Petauroides volans</i>	Greater Glider	Visual	280°	20m	55H 670441 5882459	-	
10/03 23:15	ST10	55 H 670318 5882527	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670318 5882527	ST10_vid	
11/03 00:31	ST11	55 H 670536 5882063	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670536 5882062	ST11_vid	
11/03 02:17	ST12	55 H 670259 5882037	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670259 5882037	ST12_vid	
11/03 02:26	ST13	55 H 670089 5882094	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670089 5882094	ST13_vid	01
11/03 02:32	ST14	55 H 670057 5882137	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670057 5882137	ST14_vid	02
11/03 02:37	ST15	55 H 670077 5882222	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670077 5882222	ST15_16_vid	03
11/03 02:38	ST16	55 H 670077 5882223	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670077 5882223	ST15_16_vid	04
11/03 02:45	ST17	55 H 670031 5882296	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670031 5882296	ST17_vid	05
11/03 03:04	ST18	55 H 670024 5882349	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670024 5882349	ST18_vid	06
11/03 03:11	ST19	55 H 670087 5882480	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670087 5882480	ST19_vid	07
11/03 03:24	ST20	55 H 670208 5882702	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670208 5882702	ST20_vid	
11/03 03:39	ST21	55 H 670338 5882575	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670338 5882575	ST21_vid	08
11/03 03:55	ST22	55 H 670314 5882470	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670314 5882470	ST22_vid	09
11/03 04:10	ST23	55 H 670318 5882389	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670318 5882389	ST23_vid	10
11/03 04:24	ST24	55 H 670479 5882388	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670479 5882388	ST24_vid	11
11/03 04:53	ST25	55 H 670488 5882298	<i>Petauroides volans</i>	Greater Glider	Visual	0°	0m	55H 670488 5882298	ST25_vid	
11/03 04:59	ST26	55 H 670573 5882313	<i>Petauroides volans</i>	Greater Glider	Visual	150°	60m	55H 670603 5882261	ST26_vid	
11/03 05:14	ST27	55 H 670792 5882145	<i>Petauroides volans</i>	Greater Glider	Visual	145°	70m	55H 670833 5882087	ST27_vid	

Results 3 (Maps)

Figure 1. Back Swamp Creek >2 Greater Gliders p/ha

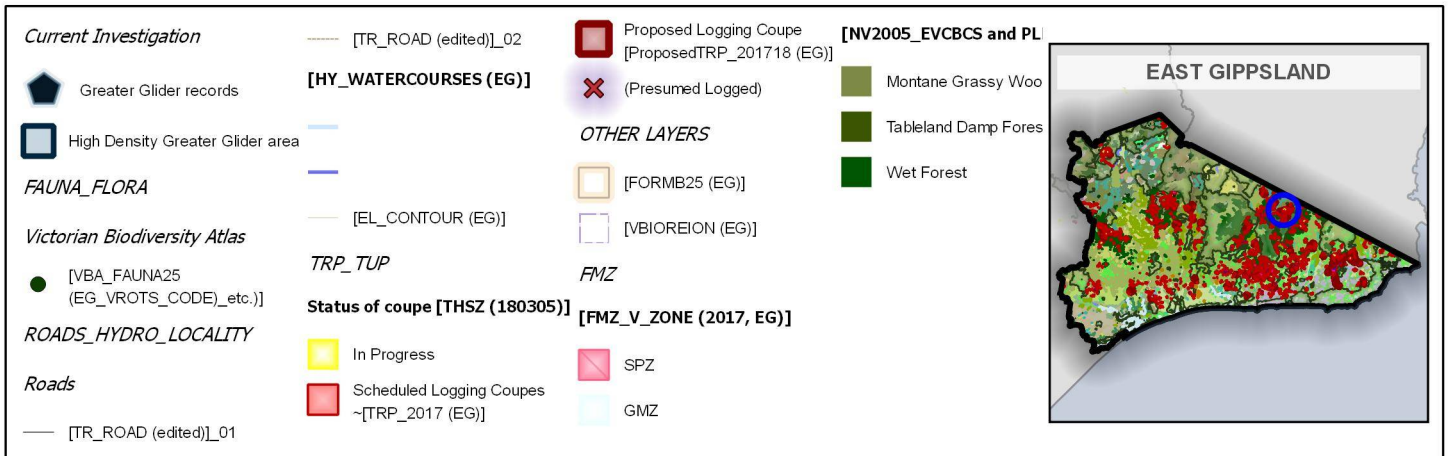
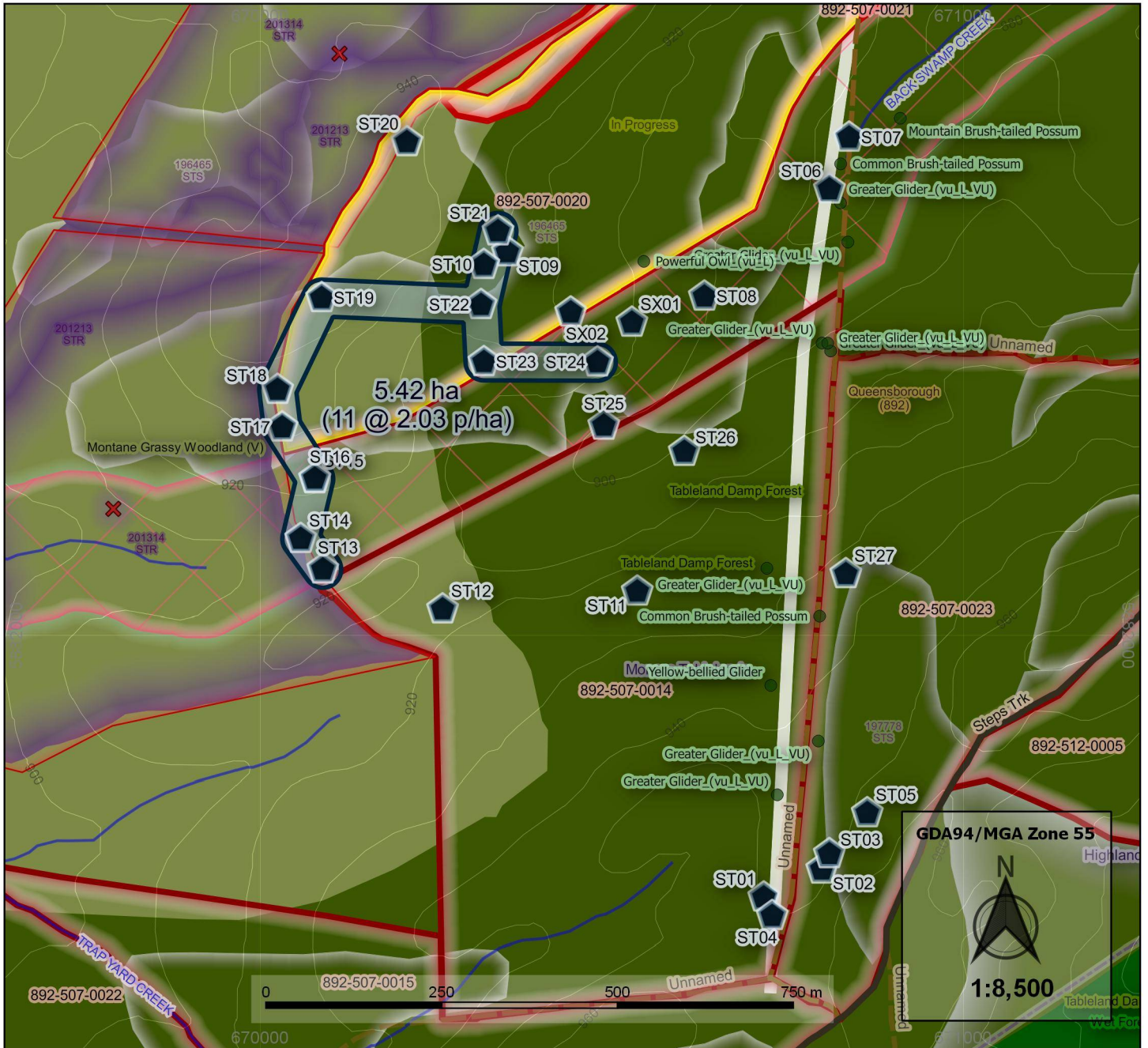
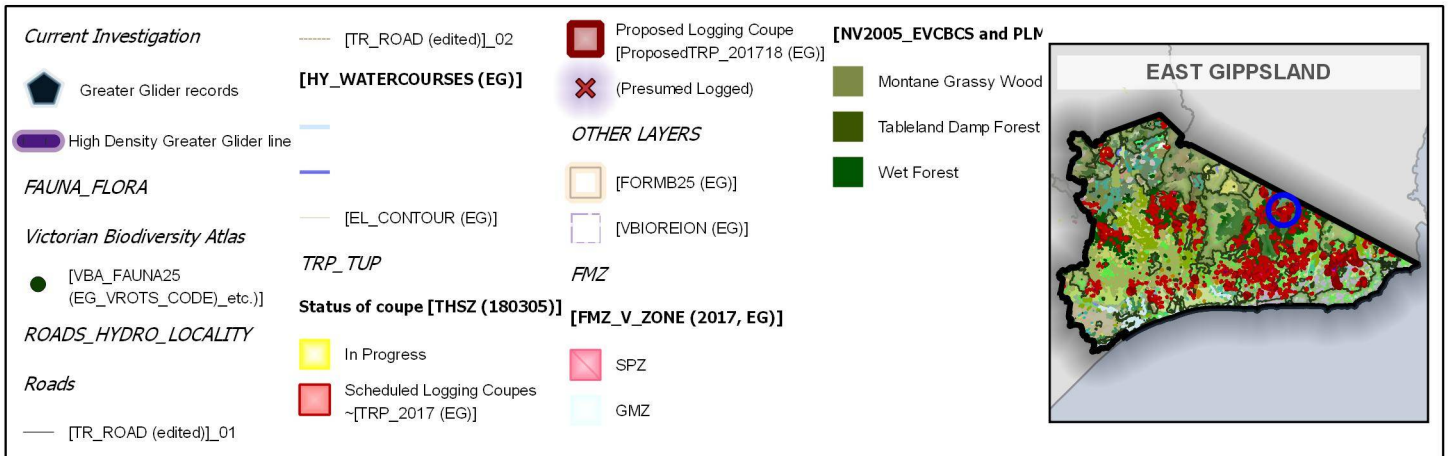
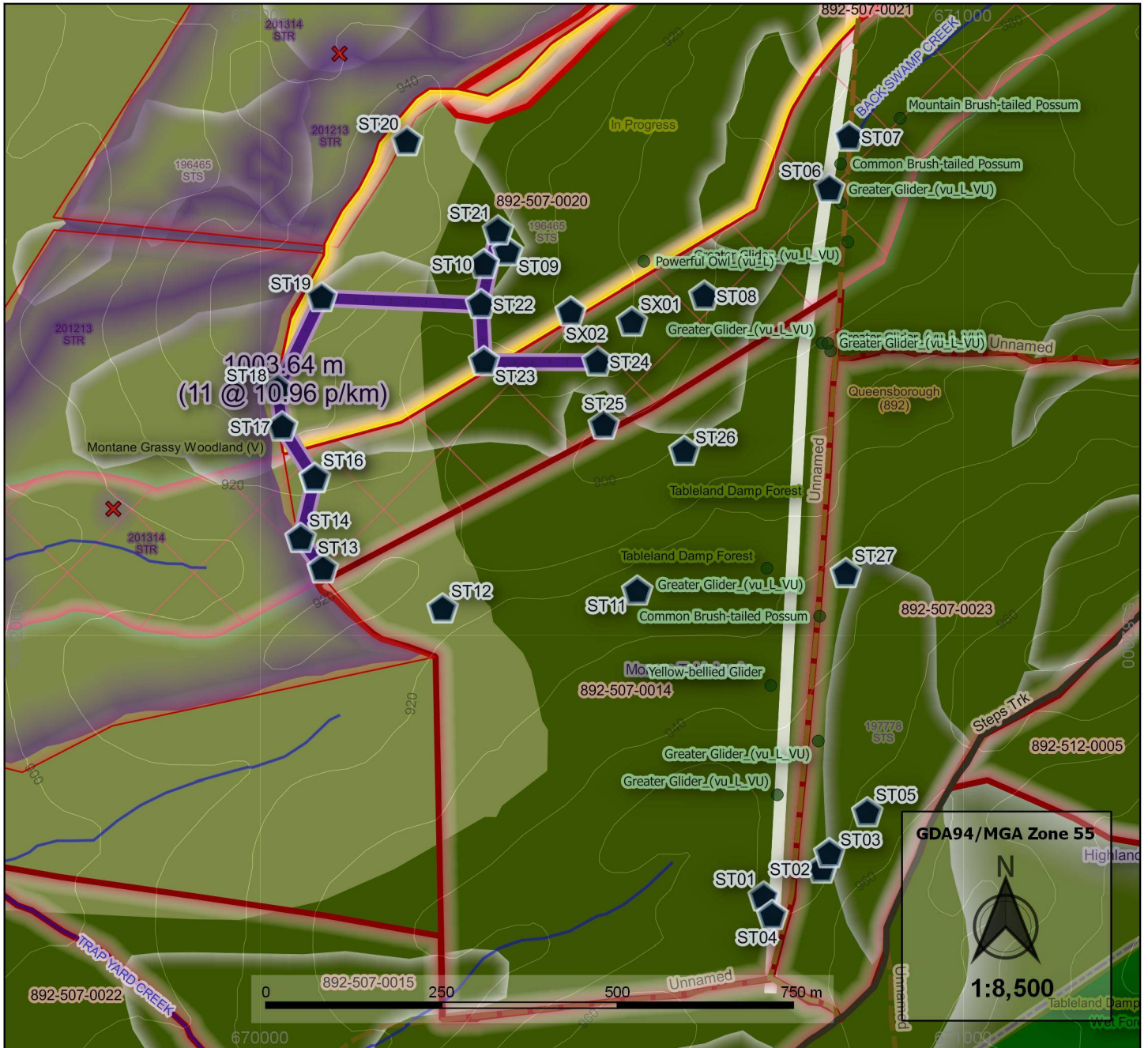


Figure 2. Back Swamp Creek >10 Greater Gliders p/km



Results 4 (Images)

Figure 3(a). Still image of Greater Glider [ST01 (ST01 vid)]



Figure 3(b). Still image of Greater Glider [ST02 (ST02 vid)]



Figure 3(c). Still image of Greater Glider [ST03 (ST03 vid)]



Figure 3(d). Still image of Greater Glider GG [ST04 (ST04 vid)]



Figure 3(e). Still image of Greater Glider GG [ST05 (ST05 vid)]



Figure 3(f). Still image of Greater Glider GG [ST06 (ST06 vid)]



Figure 3(g). Still image of Greater Glider [ST07 (ST07 vid)]



Figure 3(h). Still image of Greater Glider [ST08 (ST08 vid)]



Figure 3(i). Still image of Greater Glider [ST09 (ST09 vid)]



Figure 3(j). Still image of Greater Glider [ST10 (ST10 vid)]



Figure 3(k). Still image of Greater Glider [ST11 (ST11_vid)]



Figure 3(l). Still image of Greater Glider [ST12 (ST12_vid)]

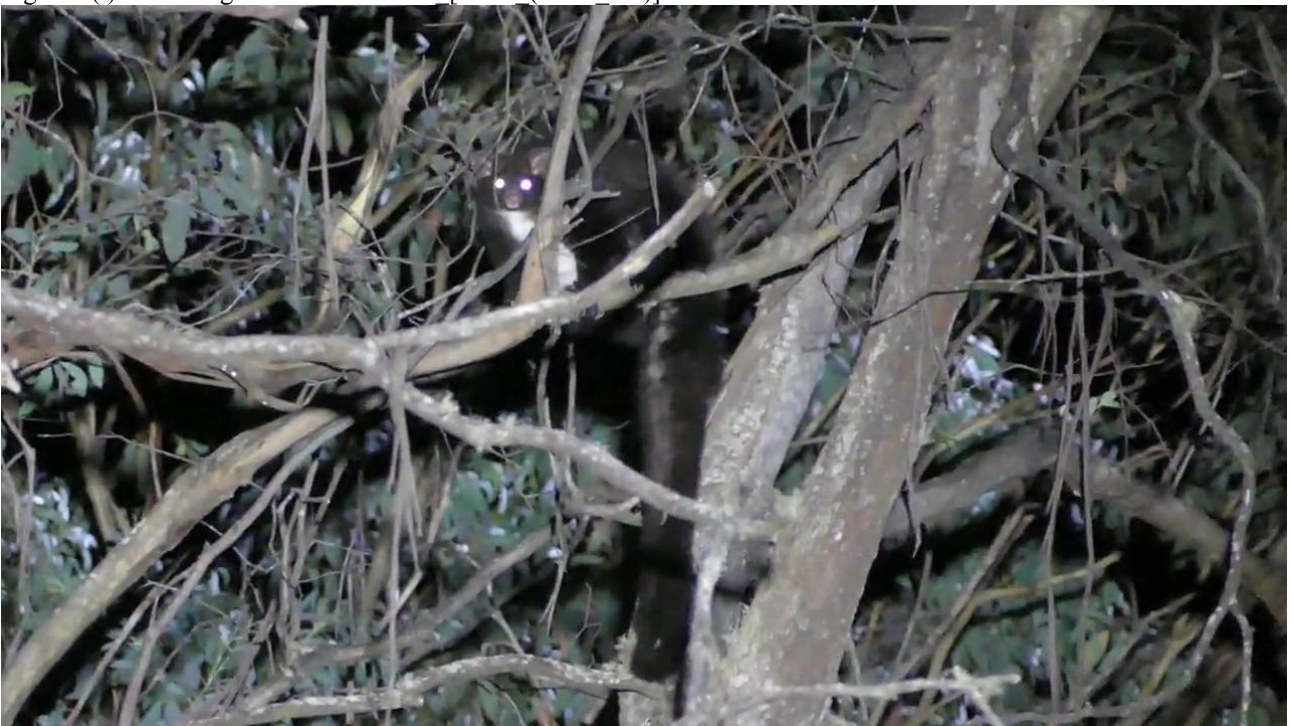


Figure 3(m). Still image of Greater Glider [ST13 (ST13_vid)]



Figure 3(n). Still image of Greater Glider [ST14 (ST14_vid)]



Figure 3(o). Still image of Greater Glider [ST15 (ST15_16_vid)]



Figure 3(p). Still image of Greater Glider [ST15 (ST15_16_vid)]



Figure 3(q). Still image of Greater Glider [ST17 (ST17_vid)]



Figure 3(r). Still image of Greater Glider [ST18 (ST18_vid)]

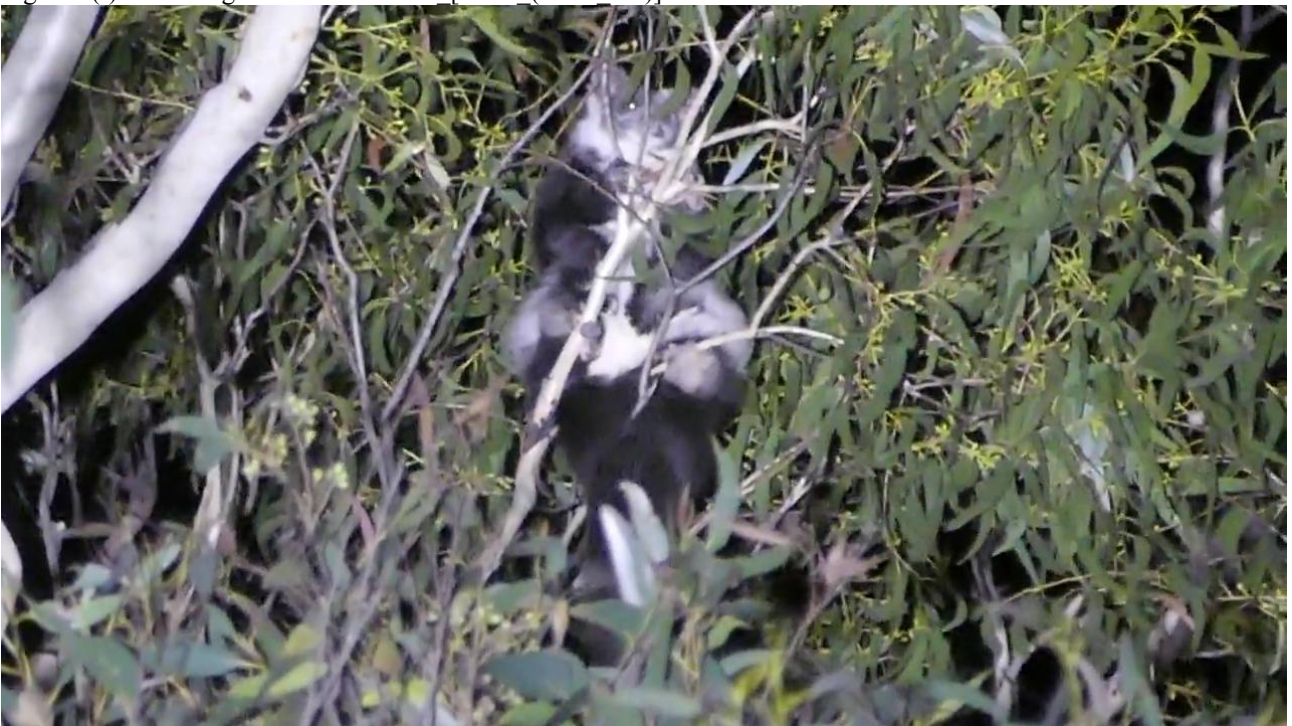


Figure 3(s). Still image of Greater Glider [ST19 (ST19 vid)]



Figure 3(t). Still image of Greater Glider [ST20 (ST20 vid)]



Figure 3(u). Still image of Greater Glider [ST21 (ST21 vid)]



Figure 3(v). Still image of Greater Glider [ST22 (ST22 vid)]



Figure 3(w). Still image of Greater Glider [ST23 (ST23 vid)]



Figure 3(x). Still image of Greater Glider [ST24 (ST24 vid)]



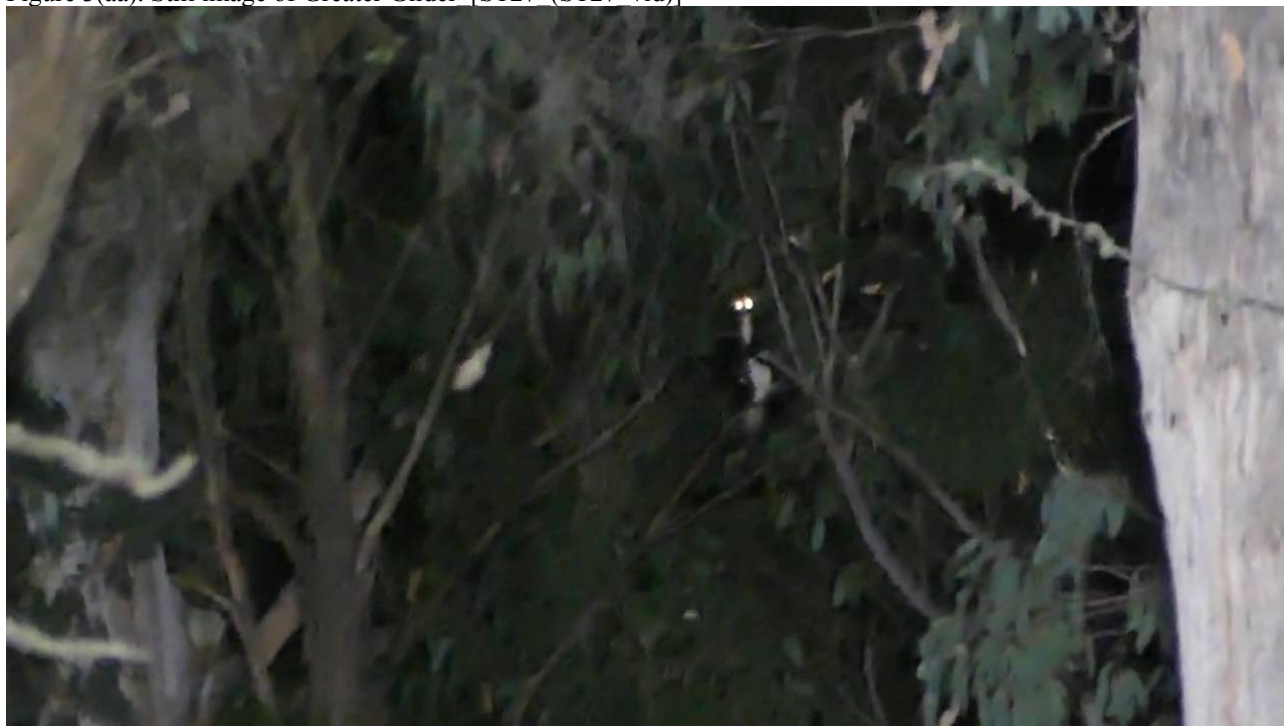
Figure 3(y). Still image of Greater Glider [ST25 (ST25 vid)]



Figure 3(z). Still image of Greater Glider [ST26 (ST26 vid)]



Figure 3(aa). Still image of Greater Glider [ST27 (ST27 vid)]



Summary/Conclusions/Discussion

Detection of Greater Gliders (*Petauroides volans*)

1. Within and adjacent to VicForests proposed logging coupe 892-507-0020 high numbers of Greater Gliders (*Petauroides volans*) were observed and recorded within a nocturnal fauna spotlighting survey on the evenings of 10-11/03/2018. These record locations are displayed in the Table and Maps of this report.
2. On 10 November 2016 the Victorian Flora and Fauna Guarantee Scientific Advisory Committee (SAC) received a nomination for listing as a threatened species for the Greater Glider (*Petauroides volans subsp. volans* Kerr 1792). A preliminary nomination supporting the listing of the Greater Glider was made on 21 November 2016 and on 16 March 2017 the SAC made its final nomination recommending the Greater Glider be listed as threatened.⁴
3. In the SAC's final nomination they noted that "Wood production practices are known to substantially deplete Greater Glider populations and gliders usually die if all or most of their home range is intensively logged or cleared (Menkhorst op. Cit.)".⁵
4. The SAC found that the Greater Glider satisfied their criteria for listing on the basis that:
 1. The Greater Glider is "in a demonstrable state of decline which is likely to result in extinction";
 2. The Greater Glider is "significantly prone to future threats which are likely to result in extinction", and;

4 Final Recommendation on a nomination for listing, *Petauroides volans subsp. volans* Kerr 1792 - Greater Glider (Nomination no. 879, Item no.: 11133), Flora and Fauna Guarantee Scientific Advisory Committee (SAC), March 2017, p. 1

5 *ibid.*, p. 3

3. The threat to the Greater Glider is “currently operating and is expected to operate at a level in the future which is likely to result in the extinction of the [greater glider]”⁶
5. The SAC note that:
“Timber harvesting in greater glider habitat has been proven to cause declines and/or local extinctions of greater glider populations (Lindenmayer et al. 2011, Kavanagh and Webb 1998, Lunney 1987, Dunning and Smith 1986, Tyndale-Biscoe and Smith 1969). Timber harvesting practices reduces the number of hollow bearing trees available for denning by tree removal or as a result of regeneration burns after the logging (Lindenmayer et al. 2011, 2002; Lunney 1987). In addition, the species does not cope well with habitat change (Kavanagh and Wheeler 2004, Tyndale-Biscoe and Smith 1969). Although all animals may not die from the initial impact they will die shortly afterwards. This is due to life history traits: affinity with home range, small home ranges, attachment to hollow bearing trees they use for denning and their specialist diet (Tyndale-Biscoe 2005).
- In Victoria timber harvesting is widespread in the eastern and central parts of state. This is also the main distribution and habitat of the greater glider. Considering the known impacts of timber harvesting on gliders (Kavanagh and Webb 1998, Lunney 1987, Tyndale-Biscoe and Smith 1969, Dunning and Smith 1986), it is likely that other local extinctions of this species have already occurred and will continue to occur in the future.” ...*
- “Local extinctions from fire, timber harvesting, drought or predation across the range of the greater glider will lead to a loss of habitat connectivity. McCarthy and Lindenmayer (1999) and Possingham et al (1994) found small patch sizes (McCarthy and Lindenmayer: less than 500 ha; Possingham et al. less than 1000 ha) of habitat are unviable for the greater gliders long-term viability. Lindenmayer and Taylor (2003) found evidence of genetic erosion in the species after 5-6 generations in small forest patches (approximately 20ha) near Tumut in southern New South Wales.”⁷*
6. The SAC also highlight that “Greater Gliders have recently been classified as ‘Vulnerable’ under the Environment Protection and Biodiversity Conservation Act 1999 (Department of Environment and Energy 2016)”⁸
7. On 08 June 2017 in General Government Gazette “GG2017G023” Lily D’Ambrosio, Minister for Energy, Environment and Climate Change, and Jaala Pulford, Minister for Agriculture “decided to recommend to the Governor in Council that the [Greater Glider] be added to the Threatened List for the reasons that [the Greater Glider] ... is in a demonstrable state of decline which is likely to result in extinction[, the Greater Glider] is significantly prone to future threats which are likely to result in extinction [and] the threat is currently operating and is expected to operate at a level in the future which is likely to result in the extinction of the taxon.”⁹
8. On 14 June 2017 the Greater Glider was added to the “Threatened List” under the Flora and Fauna Guarantee Act, and notice was given of this on 15 June 2017 in the Victorian Government Gazette no. G24.¹⁰

6 *ibid.*, p. 1-2

7 *ibid.*, p. 3

8 *ibid.*, p. 3

9 Victoria Government Gazette, By Authority of Victorian Government Printer, GENERAL No. G 23 Thursday 8 June 2017, <http://www.gazette.vic.gov.au/gazette/Gazettes2017/GG2017G023.pdf> (accessed 08/06/2017)

10 Victoria Government Gazette, By Authority of Victorian Government Printer, GENERAL No. G 24 Thursday 15 June 2017, <http://www.gazette.vic.gov.au/gazette/Gazettes2017/GG2017G024.pdf> (accessed 23/06/2017)

9. **Given the presence of Greater Gliders within and/or adjacent to coupes 892-507-0020, 892-507-0021, 892-507-0014 and 892-507-0023 as detailed in this report, the Department of Environment, Land, Water and Planning should restrain and VicForests should refrain from scheduling and logging this coupe including to comply with the precautionary principle as required by the Code of Practice for Timber Production 2014.**

High-density of Greater Gliders (*Petauroides volans*)

10. Both the “*Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014*” (Department of Environment and Primary Industries, The State of Victoria, 2014) through its “*Planning Standards for timber harvesting operations in Victoria’s State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014*” and the Forest Management Plan For The East Gippsland Forest Management Area (Victorian Department of Conservation and Natural Resources, East Melbourne, December 1995) require that an SPZ (Special Protection Zone) of approximately 100ha of suitable habitat be established for records of > 2 individual Greater Gliders per hectare and > 10 individual Greater Gliders per kilometer.
11. 11 of the 27 uniquely labelled "large white outlined dark blue pentagon" Greater Glider records shown in the map of Results 3. Figure 1. fall within the corresponding 5.42 hectare “dark blue solid outlined and light grey filled” polygon. These 11 Greater Glider individuals are present at a density of 2.03 Greater Gliders per/ha.
12. 11 of the 27 uniquely labelled "large white outlined dark blue pentagon" Greater Glider records shown in the map of Results 3. Figure 2. along the 1003.64 metre "purple and white outlined" line show these 11 Greater Glider individuals at a density of 10.96 Greater Gliders per/km.
13. Each of the two configurations of 11 Greater Gliders described above constitute a "High-density of Greater Gliders" according to the density and frequency triggers contained within the relevant sections of the regulatory framework described above.
14. In order to meet the requirements of the High Density of Greater Glider prescriptions contained within the regulatory framework governing logging operations in Victoria's State Forests, Special Protection Zones to protect these Greater Glider configurations must be established and fully implemented prior to any logging operations in this area.
15. **VicForests must refrain from and the Department of Environment, Land, Water and Planning must restrain VicForests from scheduling and logging within any of the forest areas proposed for logging within coupes 892-507-0020, 892-507-0021, 892-507-0014 and 892-507-0023.**