

INVESTIGATION REPORT

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

DARTMOOR TRACK

VicForests' Logging Coupes:
895-505-0012, 895-505-0013

Abstract

Forest areas within and/or adjacent to VicForests scheduled logging coupes 895-505-0012 and 895-505-0013 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 Glider (*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

Relevant Organisations

- VicForests

Status of Site

Coupe 895-505-0012 and 895-505-0013 are scheduled for logging.

Date of Investigation

12-13/08/2016

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Method 1 (Nocturnal Fauna Spotlighting Survey)

Nocturnal Fauna Survey [12-13/08/2016]

Equipment Used

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

Method - General

1. On the 12 August 2016 a spotlighting survey was commenced around the initial locations and times listed below in the Table of the Results 2. section in the Cottonwood Forest Block.
2. The forest within logging coupes 895-505-0012 and 895-505-0013 and along Dartmoor Track was searched for the presence of nocturnal fauna principally by shining a hand-held spotlight to detect fauna movement or “eye shine”.
3. As fauna were observed their locations were marked with a GPS and time, species, bearing from and a rough estimate of the distance from observation location were noted.

(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 [as at August 2015])

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.

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 three maps (Figures 1-3.) 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. 16 Greater Glider records are shown as the uniquely labelled "large white outlined dark blue pentagons". These 16 Greater Glider records were present within a 7.81ha polygon area. 14 of the 16 Greater Glider records are shown along a 1299.33m line connecting the locations where each of the 14 Greater Gliders were recorded.

Greater Glider records and other nocturnal fauna species detection locations from this and other surveys (though not included in the density analysis described above) are also shown and displayed according to the maps legend. Additional Greater Glider records demonstrate the minimum encountered Greater Glider occupancy of the forest area surveyed.

Results 4 (Photos)

The "Results 4. (Photos)" section presents photographs of Greater Glider (*Petauroides volans*) individuals and other species encountered and photographed throughout the study location and recorded within the "Surveys" (Spotlighting Transects) detailed above. See the note beside each photo for further detail.

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 2 (Tables)

Table 1. 12-13 August 2016_Nocturnal Fauna Spotlighting Records

Time	Waypoint	Recording Location	Species	Common Name	Type	Bearing	Distance	Projected Animal Location (approx.)	Unique Individuals (Cumulative Tally)^
20:43	DM01GGV255X30	55H 661120 5885376	<i>Petauroides volans</i>	Greater Glider	Visual	255°	30	55H 661091 5885369	(1)
20:53	DM02GGV355X20	55H 661161 5885343	<i>Petauroides volans</i>	Greater Glider	Visual	355°	20	55H 661159 5885364	(2)
21:27	DM03GGV285X20	55H 661488 5885425	<i>Petauroides volans</i>	Greater Glider	Visual	285°	20	55H 661469 5885431	(3)
21:40	GG4B0D5	55H 661485 5885294	<i>Petauroides volans</i>	Greater Glider	Visual	0°	5	55H 661485 5885300	(5)
21:41	DM04GGVNA0	55H 661563 5885466	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661563 5885466	(4)
21:48	DM05GGVNA0	55H 661593 5885454	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661594 5885454	(6)
21:52	DM06GGVNA0	55H 661605 5885433	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661606 5885433	(7)
22:05	DM07MBPNA0	55H 661566 5885469	<i>Trichosurus cunninghami</i>	Mountain Brushtail Possum	Visual	N/A	N/A	55H 661567 5885470	N/A
22:30	GG8B180D0	55H 661773 5885398	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661773 5885399	(?)*
22:36	DM08GGV10X20	55H 661595 5885553	<i>Petauroides volans</i>	Greater Glider	Visual	10°	20	55H 661599 5885573	(8)
22:59	DM09GGVNA0	55H 661713 5885606	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661714 5885607	(9)
23:07	YBGB90D30	55H 661895 5885656	<i>Petaurus australis</i>	Yellow-bellied Glider	Aural	90°	30	55H 661925 5885656	(?)*
23:21	DM10GGVNA0	55H 661873 5885592	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661874 5885592	(10)
23:53	DM11GGVNA0	55H 661891 5885680	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661892 5885681	(11)
23:57	DM12YBGA70X200	55H 661887 5885676	<i>Petaurus australis</i>	Yellow-bellied Glider	Aural	70°	200	55H 662075 5885745	(?)*
00:11	YBG2B100D2	55H 662000 5885796	<i>Petaurus australis</i>	Yellow-bellied Glider	Visual	100°	2	55H 662002 5885796	(1)
00:23	YBG3B90D30A	55H 661980 5885805	<i>Petaurus australis</i>	Yellow-bellied Glider	Aural	90°	30	55H 662010 5885805	(2)
00:36	YBG4B90D10V	55H 661987 5885808	<i>Petaurus australis</i>	Yellow-bellied Glider	Visual	90°	10	55H 661997 5885808	(3)
00:42	DM13GGVNA0	55H 661871 5885716	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661872 5885716	(12)
01:50	DM14GGVNA0	55H 662072 5885672	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 662073 5885672	(13)
02:03	DM15GGVNA0	55H 662010 5885556	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 662011 5885556	(14)
02:12	DM16GGVNA0	55H 661988 5885458	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661989 5885458	(15)
02:22	DM17GGVNA0	55H 661869 5885387	<i>Petauroides volans</i>	Greater Glider	Visual	N/A	N/A	55H 661870 5885388	(16)

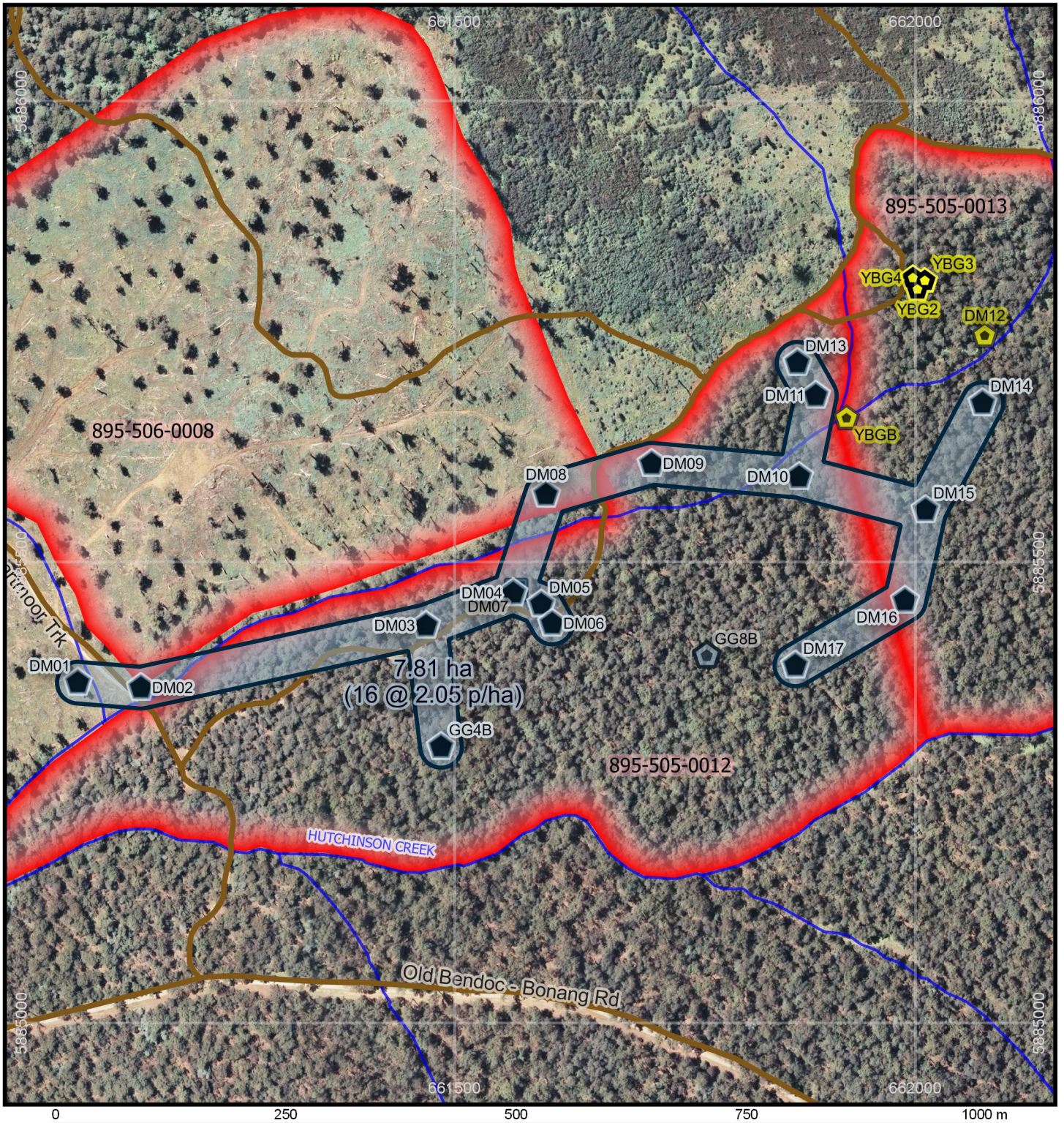
^ Green = Greater Glider; Yellow = Yellow -bellied Glider

* Not included in results analysis



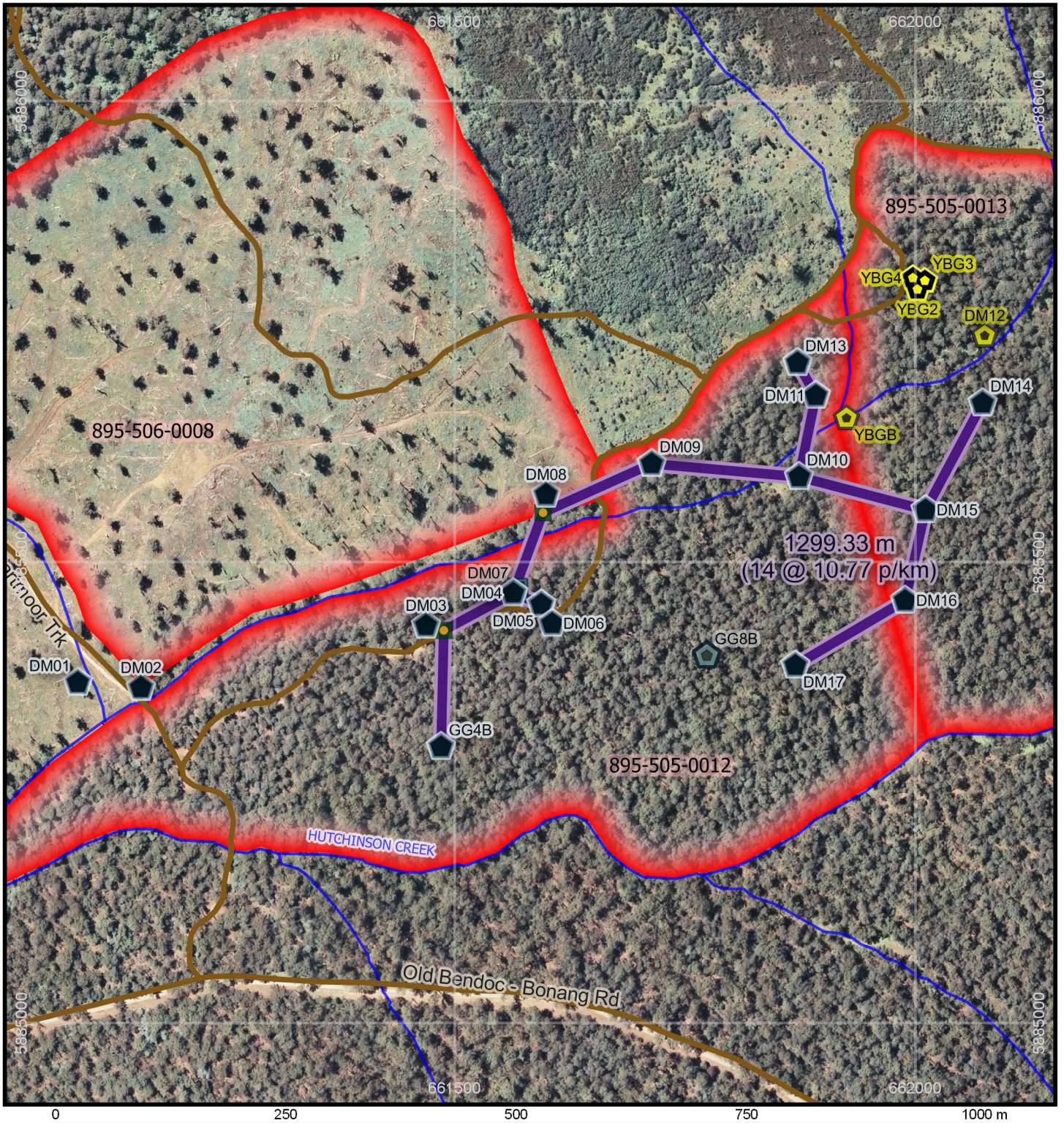
Results 3 - Maps

Figure 1. Dartmoor Track >2 Greater Gliders p/ha



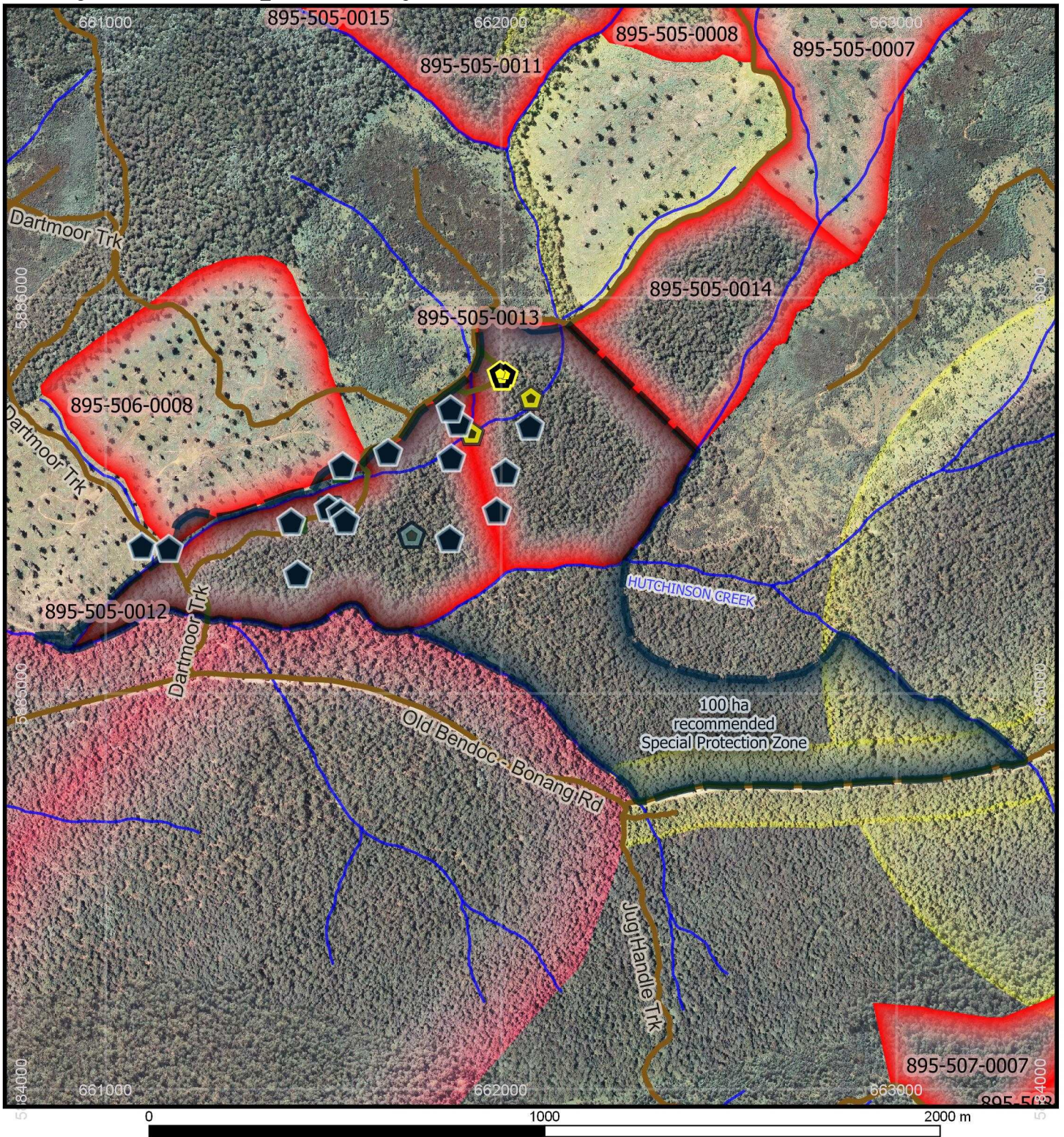
Legend			GDA94/MGA Zone 55 1:6,000
<ul style="list-style-type: none"> Greater Glider animal locations (included in analysis) Greater Glider (not included in analysis) Yellow-bellied Glider (included in analysis) 	<ul style="list-style-type: none"> Yellow-bellied Glider (not included in analysis) Mountain Brushtail Possum High Density of Greater Glider Area [16 GG's in 7.81ha @ 2.05 p/ha] 	<ul style="list-style-type: none"> Scheduled logging coupes Timber Release plan (TRP) [VicForests: August 2015] Roads Watercourses 	

Figure 2. Dartmoor Track >10 Greater Gliders p/km



Legend			GDA94/MGA Zone 55 1:6,000
<ul style="list-style-type: none"> Greater Glider animal locations (included in analysis) Greater Glider (not included in analysis) Yellow-bellied Glider (included in analysis) 	<ul style="list-style-type: none"> Yellow-bellied Glider (not included in analysis) Mountain Brushtail Possum Greater Glider Recording Locations (where fauna distance >0m) High Density Greater Glider Line [14 GG's in 1299.33m @ 10.77 p/km] 	<ul style="list-style-type: none"> Scheduled logging coupes Timber Release plan (TRP) [VicForests: August 2015] Roads Watercourses 	

Figure 3. Dartmoor Track_Recommended Special Protection Zone



Legend Greater Glider animal locations (included in analysis) Greater Glider (not included in analysis) Yellow-bellied Glider (included in analysis) Yellow-bellied Glider (not included in analysis)		Mountain Brushtail Possum Greater Glider Recording Locations (where fauna distance >0m) 100ha Special Protection Zone for High Density Greater Glider Area Scheduled logging coupes Timber Release plan (TRP) [VicForests: August 2015]		Forest Management Zones [FMZ100; DEPI; June 2014] Special Protection Zone Special Management Zone Roads Watercourses	
			GDA94/MGA Zone 55 1:14,000		

Results 4. - Photos

Figure 4a. DM01 (Greater Glider)



Figure 4b. DM02 (Greater Glider)



Figure 4c. DM03 (Greater Glider)



Figure 4d. GG4B0D5 (Greater Glider)



Figure 4e. DM05 (Greater Glider)



Figure 4f. DM06 (Greater Glider)



Figure 4g. DM07 (Mountain Brushtail Possum)



Figure 4h. DM08 (Greater Glider)



Figure 4i. DM09 (Greater Glider)



Figure 4j. DM10 (Greater Glider)



Figure 4k. DM11 (Greater Glider)



Figure 4l. YBG2B100D2 (Yellow-bellied Glider)



Figure 4m. DM13 (Greater Glider)



Figure 4n. DM14 (Greater Glider)



Figure 4o. DM15 (Greater Glider)



Figure 4p. DM16 (Greater Glider)



Figure 4q. DM17 (Greater Glider)



Summary/Conclusions/Discussion

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

1. Within and adjacent to VicForests scheduled logging coupes 895-505-0012 and 895-505-0013 high numbers of Greater Gliders (*Petauroides volans*) were observed and recorded within a nocturnal fauna spotlighting survey transects on the evenings of 12-13/08/2016. These record locations are displayed in the Tables and Maps of Results 1. as “pentagon” shaped points.
2. 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.
3. The 16 uniquely labelled "large white outlined dark blue pentagon" Greater Glider records shown in the map of Results 3. Figure 1. and falling within the corresponding 7.81 hectare “dark blue solid outlined and light grey filled” polygon recorded these 16 Greater Glider individuals present at densities of 2.05 Greater Gliders per/ha.
4. 14 of the 16 uniquely labelled "large white outlined dark blue pentagon" Greater Glider records shown in the map of Results 3. Figure 2. along the 1299.33 kilometre "purple and white outlined" line shows the presence of 14 Greater Glider individuals at a density of 10.77 Greater Gliders per/km.
5. Each of the two configurations of 16 and 14 Greater Gliders described above constitutes a "High-density of Greater Gliders" according to the density and frequency triggers contained within the relevant sections of the regulatory framework described above.
6. 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 created and fully implemented prior to any further logging operations within this area.
7. In order to ascertain the full extent and density of Greater Glider occupancy all areas of forest that are, and are adjacent to, forest scheduled for logging within and around the Dartmoor Track forests, must be thoroughly surveyed for Greater Glider presence. The results of this investigation demonstrate that large areas of forest within the Cottonwood Range forests contain High-densities of Greater Gliders that must be adequately protected through the implementation of appropriately designed Special Protection Zones.
8. The map of Results 3. Figure 3. demonstrates a "Recommended Special Protection Zone" of approximately 100ha that takes into account the most suitable habitat available for transfer into the Special Protection Zone that must be protected as a minimum responsive management action.

9. VicForests must refrain from and The Department of Environment, Land, Water and Planning must restrain VicForests from logging within any of the forest areas scheduled for logging displayed in the maps of Results 3. until all areas have been adequately surveyed with any additional "High Density" areas included in the Special Protection Zone.
10. Further to the high densities of Greater Glider area detailed above at least 3 Yellow-bellied Gliders were observed in close proximity to each other and additional surveys to assess the density of Yellow-bellied Gliders at this location should also be undertaken.

