INVESTIGATION REPORT

LOGGING WITHIN

WARM TEMPERATE RAINFOREST

& VEGETATIVE RAINFOREST BUFFERS

AND

RAINFOREST SITE OF SIGNIFICANCE

(EG87 - Serpentine Creek)

Jack Two Track

VicForests logging coupe 867-502-0007

Abstract

Sections of VicForests scheduled logging coupe 867-502-0007 were investigated to assess the presence and extent of Warm Temperate Rainforest and to ascertain whether appropriate vegetative rainforest buffers had been provided and that logging had been excluded from these areas.

This report finds that areas of Warm Temperate Rainforest were identified within coupe 867-502-0007 and that logging was documented within areas of mandatory vegetative rainforest buffers.

This investigation also notes that coupe 867-502-0007 is located within a "Rainforest Site of Significance" (EG87 - Serpentine Creek).

Recommendations are made to the Department of Environment, Land, Water and Planning (the Department) to prosecute VicForests for logging areas of Warm Temperate Rainforest vegetative rainforest buffers and Warm Temperate Rainforest areas and that all remaining rainforest areas be excluded from logging and that no further logging is undertaken within the "Rainforest Site of Significance".

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

Organisations participant in breach

- VicForests
- Contractors operating within coupe 867-502-0007

Status of Site

Coupe 867-502-0007 has been logged in part and remains scheduled for logging

Date of Investigation

02-04/04/2016

Date of report

08/07/2016

Surveyors

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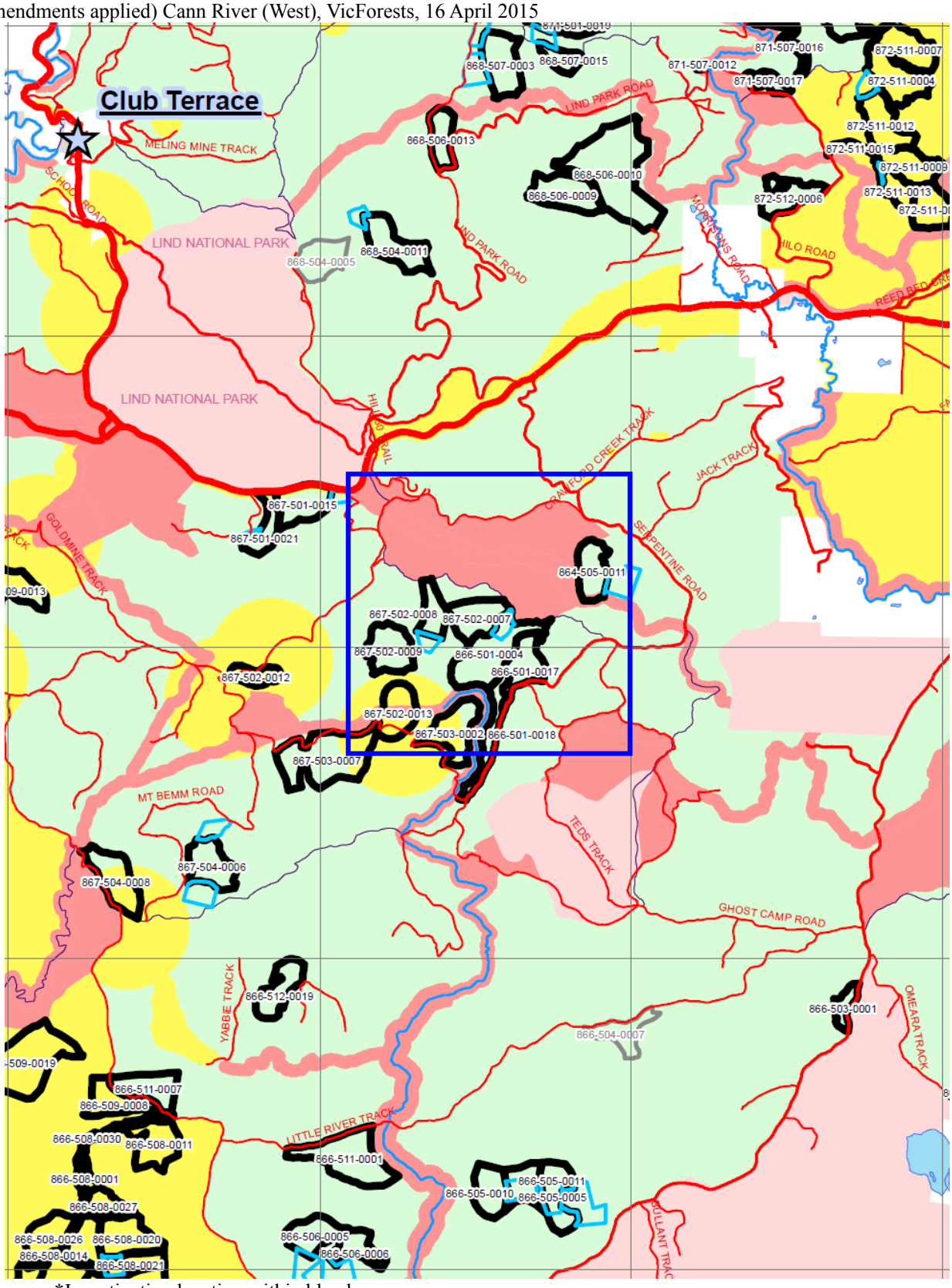
Study Location Overview

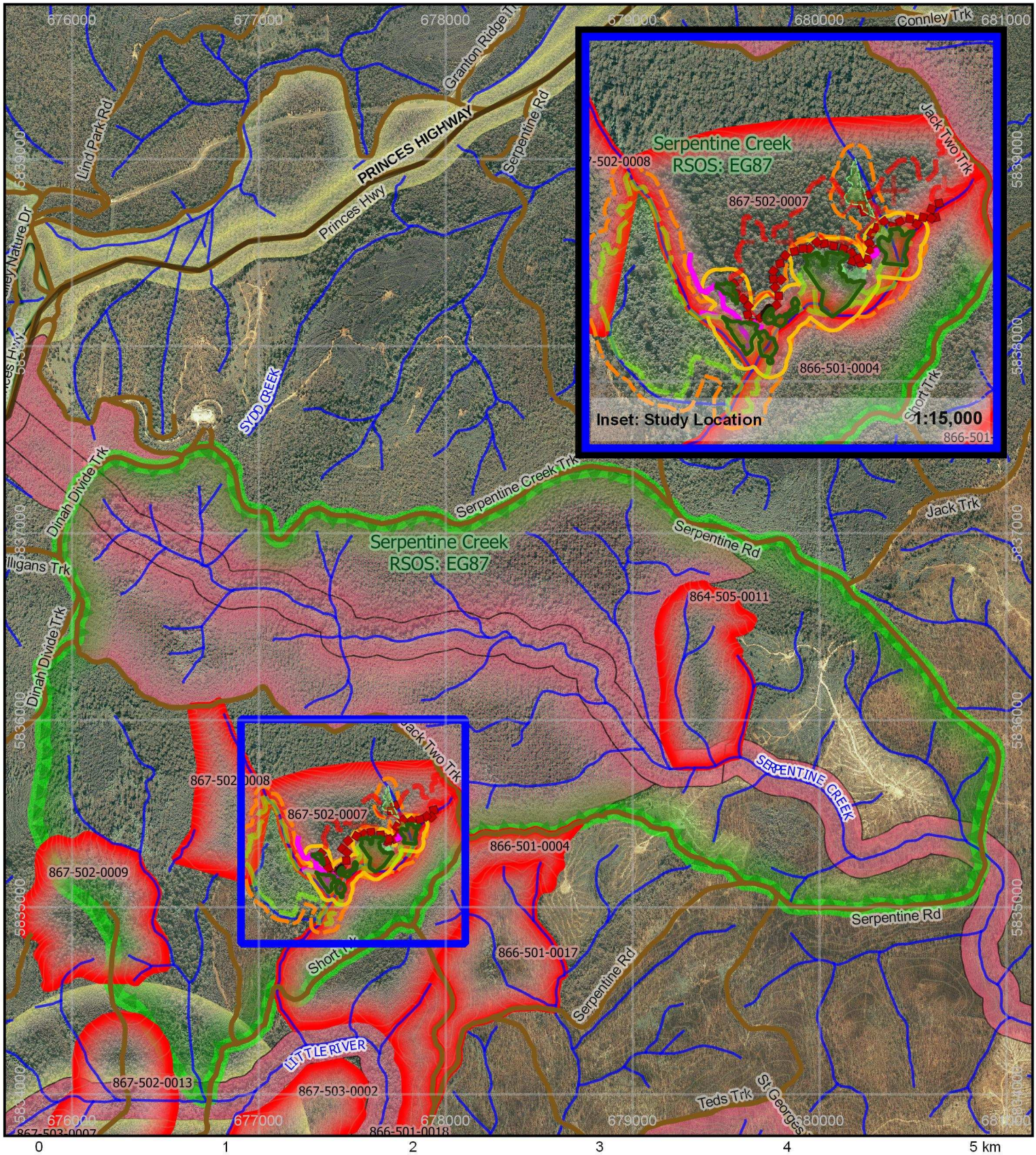
Within VicForests scheduled logging coupe 867-502-0007 off Jack Two Track in the Dinah Forest Block of East Gippsland and Rainforest Site of Significance "Serpentine Creek RSOS: EG87" (see following page).

Figure A(i). Detail from: "Approved Timber Release Plan 2013 - 2016 Change Map; April 2015 (with all approved amendments applied) Cann River (West), VicForests, 16 April 2015



*Investigation location within blue box

Figure A (ii) 867-502-0007 - Serpentine Creek Rainforest Site of Significance [EG87] - Study Location Overview



Legend

Rainforest Stand
- Minimum areas of mature rainforest or rainforest canopy species dominance
- Minimum Rainforest Differential Species Extent
- Rainforest canopy species presence/ transitioning with non-rainforest species
- Mature Rainforest canopy species connecting less disturbed rainforest areas
- Damaged Rainforest/ Damaged Rainforest Canopy Species
- Approximate rainforest extent estimate from on ground and aerial investigation
- Expexted rainforest extent estimate from on ground and aerial investigation
- 40m Buffer on "mature rainforest" etc. only
- 40m Buffer on all rainforest stand areas
- Rainforest Site of Significance

Logging Planning/Disturbance
- Coupe demarcation tapes
- Edge of logging disturbance/ logging snig track
- Logging disturbance within 40m
- Rainforest buffer
- Scheduled Logging Coupes [Approved_TRP_August_2015]

Forest Management Zones [DEPI; June: 2014; FMZ100]
- Special Protection Zone
- Conservation Parks and Reserves
- Special Management Zone
- Parks & Reserves [PARKRES]
- Roads [VMLITE_TR_ROAD]
- Roads
- Watercourses
- Contours

Projection: EPSG: 28355
GDA94/MGA Zone 55

Map Scale:
1:27,500

N

08 July 2016

Method 1 (Resources)

Identification resources and methodology:

Resources*:*

Cameron, D., A Field Guide to Rainforest Identification in Victoria: Differential species keys for the delineation of rainforest boundaries, Victorian Government Department of Sustainability and Environment, Melbourne, 2008 (**Differential Species Guide, 2008**)

Peel, B., Rainforest and Cool Temperate Mixed Forest of Victoria, Department of Natural Resources and Environment, Melbourne, 1999 (**Peel, 1999**)

"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 (**MSP, 2014**)

"Code of Practice for Timber Production 2014", Department of Environment and Primary Industries, The State of Victoria, 2014 (**Code, 2014**)

The "Differential Species Guide" approach for identifying rainforest boundaries

Excerpts from Cameron 2008:

"Where the two [forest differential species] signals are numerically equal is defined ecologically as the actual boundary between the two communities. The boundary is where the rainforest margin and the sclerophyll forest margin meet. This is the point at which the rainforest buffer commences and extends, typically upslope, into the sclerophyll forest."

1. "Select the key which best fits your rainforest region, elevation range and climate zone.
2. Ensure the target forest is EITHER rainforest or a sclerophyll forest type commonly associated with rainforest in the area.
3. Avoid grossly or recently disturbed sites such as timber harvesting coupes and associated tracks, road verges, fire lines or recently burnt sites.
4. Search the immediate vicinity for differential species specified in the selected key.
5. Exclude isolated, possibly vagrant, individuals – only count populations but allow for differences in size and density of each target species and the availability of suitable habitat.
6. Exclude seedlings and juveniles as these may not survive at the site.
7. Compare strength of rainforest and sclerophyll forest signals by the numerical count of differential species on each list.
8. If the signal is weak and the result unconvincing, extend area of search across the slope rather than up or down the slope.
9. Search for epiphytes on trunks of tree ferns and rainforest trees and on fallen logs, remember to look into the canopy of trees for elevated epiphytes.
10. Search for riparian species in wet or boggy sites.
11. When the signal is both strong and the result convincing decide whether you are standing on the boundary (equal strength of rainforest and sclerophyll forest signals).
12. If the rainforest signal is clearly stronger than the sclerophyll forest signal, move upslope and repeat the search until a strong signal is detected.
13. If the sclerophyll forest signal is clearly stronger than the rainforest signal, move downslope and repeat the search until a strong signal is detected.
14. Repeat the search up or down slope until a strong and clearly balanced signal is detected signalling that you are standing on the rainforest boundary.
15. Mark the elevation of the boundary and measure the horizontal distance (upslope) toward the sclerophyll forest to mark the minimum prescribed width of the rainforest buffer as required in your area."[1]

1 Cameron, David, A Field Guide to Rainforest Identification in Victoria: Differential species keys for the delineation of rainforest boundaries, Victorian Government Department of Sustainability and Environment, Melbourne, 2008, p. 17

Method 2 (Methodology for Rainforest Identification and Delineation)

On Ground Identification of Warm Temperate Rainforest Stand Areas

1. The presence of Warm Temperate Rainforest was identified where a combination of the following characteristics were observed:

    (a) The rainforest areas were characterised by a more or less continuous rainforest canopy including as composed of the following "Warm Temperate Rainforest canopy species" as listed in the "MSP, 2014" at section 4.4.7.2: Lilly Pilly (*Acmena smithii*), Kanooka (*Tristaniopsis laurina*), Sweet Pittosporum (*Pittosporum undulatum*), Blackwood (*Acacia melanoxylon*), Blue Olive-berry (*Elaeocarpus reticulates*), Muttonwood (*Myrsine howittiana*) and Jungle Grape (*Cissus hypoglauca*).

    (b) The persistent presence of Warm Temperate Rainforest "differential species" as listed in the relevant section of the "Differential Species Guide, 2008".

    (c) The persistent presence of other warm temperate rainforest (non-"differential") "character species" as listed in "Peel, 1999".

    (d) The persistent presence of other obligate warm temperate rainforest non-"differential"/non-"character" species also listed in Peel (1999).

    (e) The presence of rainforest regeneration and recruitment of juvenile rainforest species, within canopy gaps and areas in transitional and seral stages.

    (f) The absence of or limited presence of Eucalypt species presence within the areas found to be mature undisturbed rainforest.

    (g) The presence of Sclerophyll Forest "differential species" (as listed in the relevant section of "A Field Guide to Rainforest Identification in Victoria: Differential species keys for the delineation of rainforest boundaries" (2011)) at higher density than rainforest differential species at the edge of or exterior to the areas identified as rainforest.

2. Where rainforest areas (as differentiated in the following "Results 1a – Summary" section) were delineated in the field to their extent, waypoints were marked repeatedly on a GPS around the edge of each differentiated rainforest area usually at a distance of approximately 10m (and an accuracy $< {}^{+-}10$m).

3. Logging activity data proximate to rainforest areas was also recorded on site as "waypoints" on a GPS usually at a distance of approximately 10m (and an accuracy $< {}^{+-}10$m).

4. Where rainforest areas or logging activity data were modelled or estimated following one or a combination of on ground or aerial/satellite assessment (as differentiated in the following "Results 1a – Summary" section), on ground observation locations were compared with contiguous forest areas observed whilst viewing aerial and/or satellite imagery and were plotted using GIS mapping software (QGIS).

5. The information detailed above was then analysed using GPS and GIS mapping software (QGIS) and the results of this process are presented below in the following "Results", "Discussion" and "Conclusions" sections of this report.

Results 1 (Summary)

Warm Temperate Rainforest Stand – Differentiated Areas

1. Within and adjacent to VicForests logging coupe 867-502-0007 large areas of Warm Temperate Rainforest (**rainforest**) were identified. The rainforest areas identified and delineated at this location have been assessed using various criteria and methods in order to provide a detailed representation of rainforest present and impacted upon.

2. The map shown as Figure 2. of Results 3. within this report distinguishes between the following areas of the rainforest present:

   (a) *Minimum areas of mature rainforest or rainforest canopy species dominance*
   These areas show rainforest in its mature form or where rainforest canopy species are largely mature and dominant and with or without emergent eucalypts and where the rainforest areas clearly met the definition of rainforest as defined in the first part of the Code's glossary entry on rainforest or its treatment of transitional and seral rainforest. The rainforest canopy species observed as forming these areas were those set out in the MSP's at section 4.4.7.2.

   These areas are akin to the "rainforest core zones" similar to that set out in the Differential Species Guide (Cameron, 2008) at page 7.

   Multiple areas of the rainforest community were identified and delineated as such and they are shown in the map of Figure 2. as the "dark green solid-outlined" areas.

   (b) *Minimum Rainforest Differential Species Extent*
   One section of the larger stand of mature rainforest delineated in the eastern section of the map[2] was also assessed to distinguish between the mature areas of this rainforest and those areas where a mature, tall and/or persistent rainforest canopy was less dominant or continuous, where canopy gaps were greater or more numerous, where rainforest canopy species were more dispersed. Despite the rainforest stand persisting in this manner this area was strongly dominated by rainforest differential species (Cameron, 2008) with a clear and strong rainforest signal that persisted up until (or in some areas beyond) the extent of the area delineated as the "Minimum Rainforest Differential Species Extent". From this extent the sclerophyll differential species signal was equal to (or sometimes still less than) the rainforest signal.

   These areas are akin to the "rainforest margin" (and forming part of the "ecotone") similar to those set out in the Differential Species Guide (Cameron, 2008) at page 7.

   This area was assessed following the directions set out in “A Field Guide to Rainforest Identification in Victoria: Differential species keys for the delineation of rainforest boundaries”[3], in particular the section dealing with “East Gippsland Warm Temperate Forest Floristic Field Identification Key”. Species listed as either “Differential Species for East Gippsland Warm Temperate Rainforest”(WTRF) or species listed as “Differential Species for East Gippsland Warm Temperate Sclerophyll Forest”(WTSF) were searched for along topographical contours around the identified rainforest stand

2 NOTE: other areas of the rainforest present on site were not delineated to their full extent, i.e. to the point along their boundary, radiating from the "rainforest core zone" where the rainforest and sclerophyll differential species signals were of equal strength. As such, actual rainforest boundaries are likely to be greater than those shown in the maps contained within this report.

3 Cameron, D., 2008

in order to delineate its boundary.

Rainforest boundary delineation began by starting within the "rainforest core zone" (or "*Minimum areas of mature rainforest/rainforest canopy species dominance*" described above). From this location the rainforest boundary was found using the differential species approach; i.e. where there was an even ratio of sclerophyll and rainforest differential species present (i.e. 4/4; 1/1 ratio of differential species), or at least one more rainforest differential species, (i.e. 3 sclerophyll forest species and 4 rainforest species present), thus mapping a line closer towards the rainforest side of the "ecotone" than the sclerophyll forest. The ecotone was navigated along the rainforest boundary, repeatedly applying the above methodology whilst marking waypoints along the way.[4]

The extent of this area relating to the northern sections of the rainforest stand in the eastern section of the map is shown in the map of Figure 2. as the "light green shaded and dotted" area on the outskirts of that area of the rainforest stand.

(c) *Rainforest Canopy Species Presence/transitioning with non-rainforest species*
A section of the rainforest stand (the largest "*Minimum areas of mature rainforest/rainforest canopy species dominance*" polygon) in the centre of the rainforest areas shown in the map of Figure 2., was assessed to ascertain its boundary's transitional nature from rainforest species projected foliage cover to "nonrainforest" species projected foliage cover. The delineation of this area shows the presence along the rainforest stands border of a gradual transition over a distance greater than 10m akin to that described in the MSP's at section 4.4.8.7.

This area is shown in the map of Figure 2. as the "light green shaded and green triangled" area.

(d) *Mature Rainforest canopy species connecting less disturbed rainforest areas*
A section of the central-southern portion of the rainforest areas mapped has been identified as supporting very large mature rainforest canopy trees in an open structural formation believed in part to be the product of localised wind-throw as well as edge effects from prior logging history disturbance (from 1979-80 according to the Victorian Government's "LASTLOG25" spatial data-set) on the south-eastern edge of this section of rainforest (Note: this prior logging disturbance extends and has impacted on the rainforest present on site to varying degrees along most of the south-eastern edge of the rainforest community). This area of mature rainforest canopy species present in a relatively open structural formation extends for approximately 40 metres and is connected with less disturbed mature sections of the rainforest stand to its north and south.

This area is shown in the map of Figure 2. as the "light yellow-green shaded and yellow-green triangled" area.

(e) *Approximate rainforest extent estimate from on ground and aerial investigation*
This area encompasses all those areas noted on site as likely forming part of the full extent of the rainforest stand (but which were not specifically delineated in a way described in other items of this section) in conjunction with an estimate of the likely minimum delineation of rainforest presence following review of aerial and satellite

4 Note: Only the section of the *rainforest boundary* of the Rainforest stand described above was delineated. The rainforest stand was observed to persist in both directions beyond the start and end points of this area.

imagery of these areas. For example, this area of rainforest considers sections of the stand that were traversed and noted as rainforest, noted as likely rainforest presence, and then in some sections extends these identified areas on the basis of obvious likely consistency in vegetation type following consideration of satellite and aerial imagery covering these areas.

This area is shown in the map of Figure 2. as the "light green dashed-outlined" areas.

(f) *Expected rainforest differential species extent estimate (on ground/aerial investigation)*
This area in the north-eastern section of the rainforest present on site was also not specifically delineated to its extent in the field but was noted as forming a northern extension and expansion of the rainforest section described under the heading "*Minimum Rainforest Differential Species Extent*" above.

Rainforest differential species dominance and varying rainforest structural formations were clearly observed within this area and the expected minimum extent has been estimated and displayed to guide further rainforest investigations on site.

This area is shown in the map of Figure 2. as the "pale green dashed-outlined and shaded with a light green '?' mark" area.

(g) *Damaged Rainforest/Damaged Rainforest Canopy Species*
In the central-western section of the rainforest stand is an area where rainforest canopy species that were forming part of a rainforest section with an intact canopy structure have been damaged.

This area is shown in the map of Figure 2. as the "dark red-brown outlined" area.

(h) *40m Buffer on "Minimum areas of mature rainforest/rainforest canopy species dominance"*
This area (shown in the map of Figure 2. as the "yellow solid-outlined" area) displays the minimum 40m buffer that should have been applied only to those areas of the rainforest stand that were assessed on ground and described above as *"Minimum areas of mature rainforest/rainforest canopy species dominance".*

(i) *40m Buffer on all rainforest stand areas*
This area (shown in the map of Figure 2. as the "orange dashed- outlined" area) displays the minimum 40m buffer that should have been applied to all areas of the rainforest stand assessed following all the criteria described above.

Logging Disturbance Affecting the Warm Temperate Rainforest Stand

3. The large areas of Warm Temperate Rainforest identified and delineated (and detailed above) have been affected in various ways by logging disturbance that have already occurred including through the lack of minimum 40m vegetative rainforest buffers. The following areas are also shown on the map of Figure 2. of Results 3. within this report:

(a) Coupe Demarcation Tapes
(b) Edge of logging disturbance/logging snig tracks closest to rainforest
(c) *Logging disturbance within 40m Rainforest buffer on mature rainforest areas only*
(d) *Logging disturbance within 40m Rainforest buffer on all rainforest stand areas*
(e) Approximate Minimum logging disturbance extent

Results 2 (Rainforest areas damaged in coupe 867-502-0007; Figures 1(a-j).)

Figure 1(a). Rainforest & buffer areas damaged (~Eastern rainforest area. View ~SE from approx.: 55 H 677796 5835466

Figure 1(b). Rainforest & buffer areas damaged (~Eastern rainforest area. View ~W from approx.: 55 H 677773 5835469

Figure 1(c). Rainforest & buffer areas damaged (N-Eastern rainforest area. View ~NNE from approx: 55 H 677773 5835469

Figure 1(d). Rainforest & buffer areas damaged (N-Eastern rainforest area. View ~N from approx.: 55 H 677726 5835472

Figure 1(e). Rainforest & buffer areas damaged (Central rainforest area. View ~S from approx.: 55 H 677581 5835434

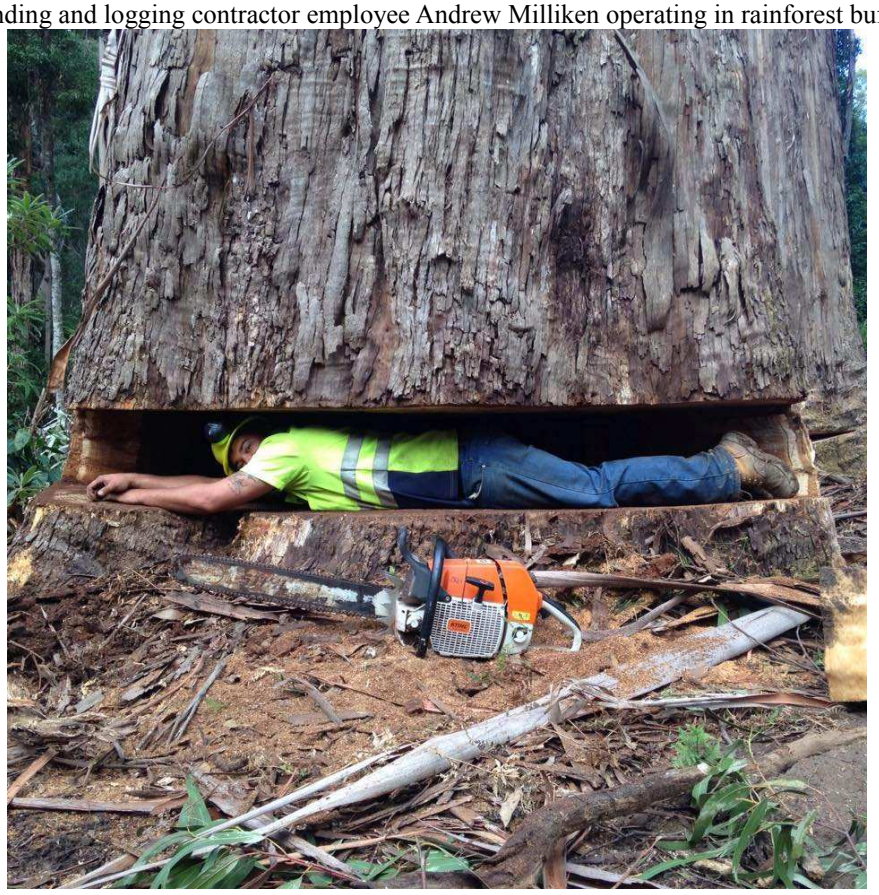
Figure 1(f). Rainforest & buffer areas damaged (Central rainforest area. View ~SE from approx.: 55 H 677482 5835437

Figure 1(g). Rainforest & buffer areas damaged (Western rainforest area. View ~SE from approx.: 55 H 677400 5835194

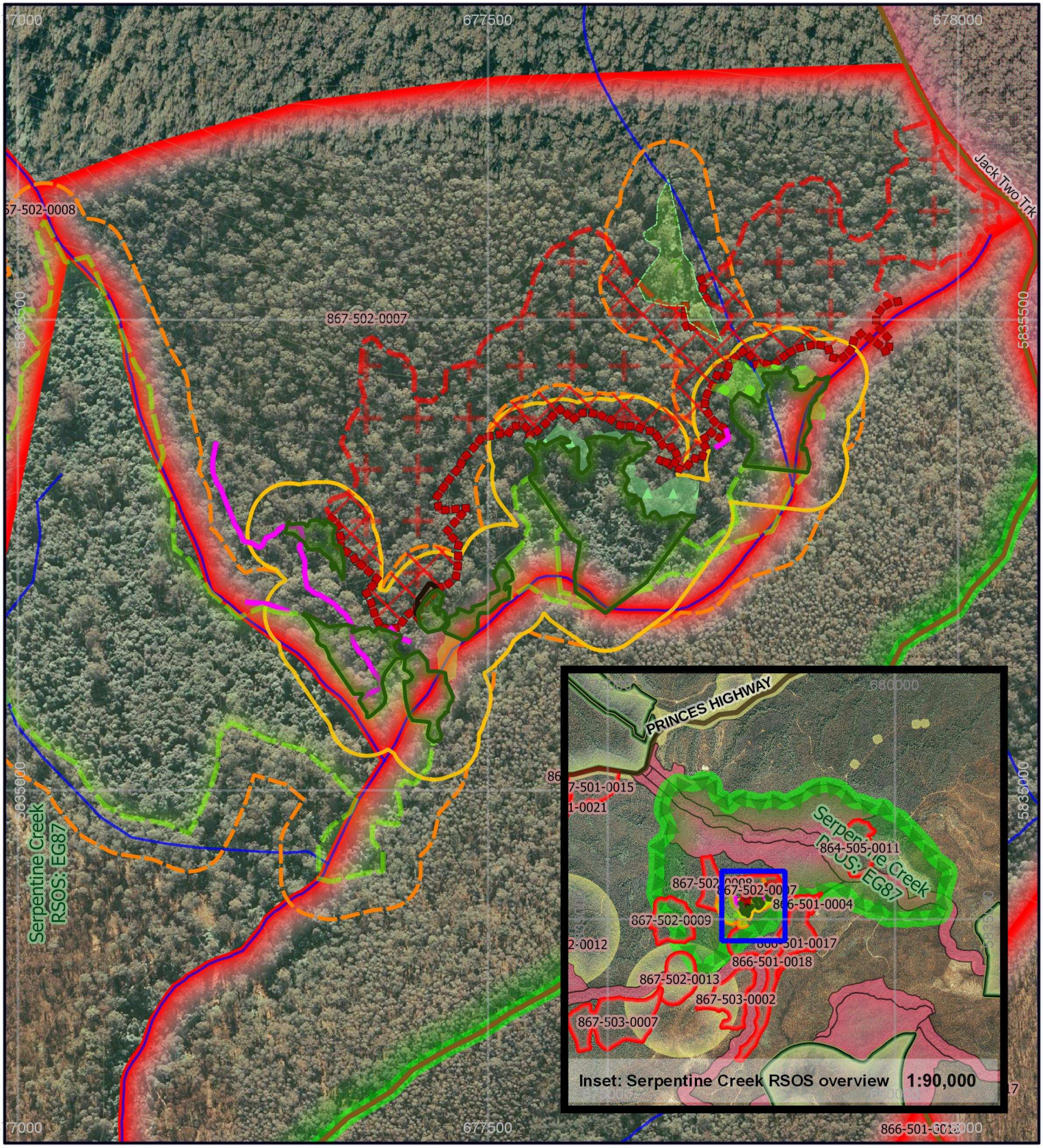
Figure 1(h). Rainforest & buffer areas damaged (Western rainforest area. View ~S from approx.: 55 H 677400 5835194

Figure 1(i). Log landing and logging contractors operating in rainforest and/or rainforest buffer areas

Figure 1(j). Log landing and logging contractor employee Andrew Milliken operating in rainforest buffer areas



Results 3. Figure 2. - Serpentine Creek Rainforest Site of Significance [EG87] - Logging of Rainforest and Minimum Rainforest Buffers



Legend

Rainforest Stand

- Minimum areas of mature rainforest or rainforest canopy species dominance
- Minimum Rainforest Differential Species Extent
- Rainforest canopy species presence/ transitioning with non-rainforest species
- Mature Rainforest canopy species connecting less disturbed rainforest areas
- Approximate rainforest extent estimate from on ground and aerial investigation
- Expexted rainforest differential species extent estimate (on ground/aerial investigation)
- Damaged Rainforest/ Damaged Rainforest Canopy Species
- 40m Buffer on "mature rainforest" etc. only
- 40m Buffer on all rainforest stand areas
- Rainforest Site of Significance

Logging Planning/Disturbance

- Coupe demarcation tapes (part)
- Edge of logging disturbance/ logging snig tracks closest to rainforest
- Logging disturbance within 40m Rainforest buffer
- Approximate minimum logging disturbance extent
- Scheduled Logging Coupes [Approved_TRP_August_2015]

Forest Management Zones [DEPI; June: 2014; FMZ100]

- Special Protection Zone
- Roads
- Watercourses
- Contours

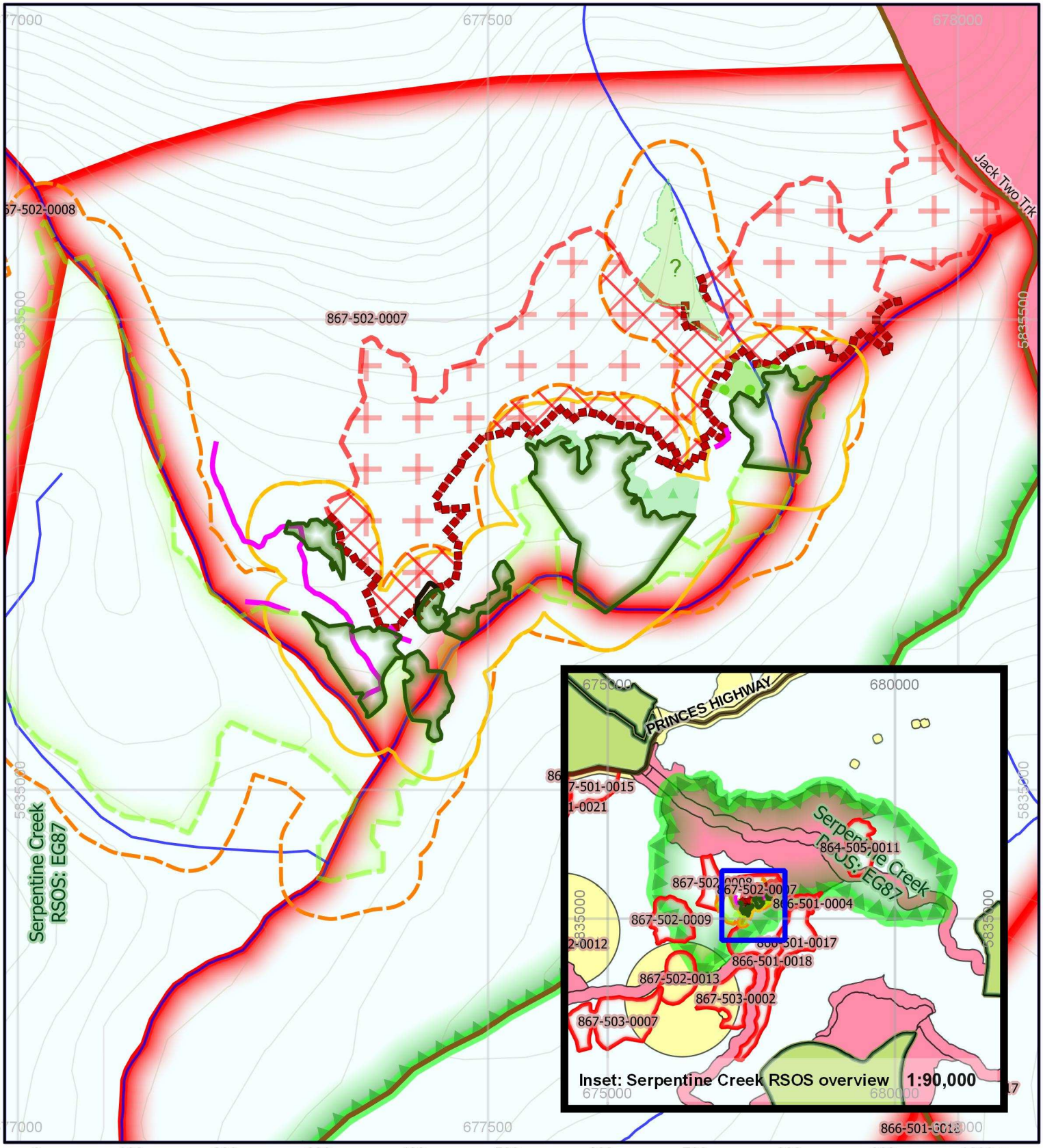
Projection: EPSG: 28355
GDA94/MGA Zone 55

Map Scale:
1:5,500

N

08 July 2016

Results 3. Figure 3. - Serpentine Creek Rainforest Site of Significance [EG87] - Logging of Rainforest and Minimum Rainforest Buffers



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Projection: EPSG: 28355
GDA94/MGA Zone 55

Map Scale:
1:5,500

N

08 July 2016

Considering the following regulatory provisions:

Excerpts from: "*Code of Practice for Timber Production 2014, Department of Environment and Primary Industries, The State of Victoria, 2014*" **(Code)**

1 General

1.2 The Code of Practice for Timber Production

...

1.2.6 Compliance on State forest

Under the *Sustainable Forests (Timber) Act 2004*, compliance with this Code is mandatory for any person planning for or conducting a timber harvesting operation on **State forest**. Penalties for noncompliance may apply if timber harvesting operations on State forest are not in accordance with the Code.

...

Incorporated Documents

The *Management Standards and Procedures for timber harvesting operations in Victoria's State forests* (Management Standards and Procedures) are incorporated into this Code to provide detailed mandatory operational instructions, including region specific instructions for timber harvesting operations in Victoria's State forests.[5]

The **Management Standards and Procedures** are consistent with the Operational Goals and Mandatory Actions of this Code and must be complied with for **timber harvesting operations** in Victoria's **State forests**.

...

2 Code Application – State Forests

2.2 Environmental Values in State forests

Timber harvesting operations in native forests may have local impacts on environmental values such as water quality and **biodiversity**. Appropriate planning and management through the lifecycle of the timber harvesting operation can minimise these impacts. This section includes requirements that must be observed during planning, roading, harvesting, tending and regeneration of native forests.[6]

...

2.2.2 Conservation of Biodiversity

Operational Goal

Timber harvesting operations in **State forests** specifically address **biodiversity** conservation risks and consider relevant scientific knowledge at all stages of planning and management. Harvested State forest is managed to ensure that the **forest** is regenerated and the biodiversity of the **native forest** is perpetuated.

The natural floristic composition and representative gene **pools** are maintained when regenerating native forests by protecting long-lived **understorey** species and using appropriate seed sources and mixes of dominant species.

Forest health is monitored and maintained by employing appropriate preventative, protective and remedial measures.

...

Mandatory Actions

Addressing biodiversity conservation risks considering scientific knowledge

2.2.2.2 The **precautionary principle** must be applied to the conservation of biodiversity values. The application of the precautionary principle will be consistent with relevant monitoring and research that has improved the understanding of the effects of forest management on forest ecology and conservation values.

2.2.2.3 The advice of relevant experts and relevant research in conservation biology and flora and fauna management must be considered when planning and conducting timber harvesting operations.

5 Code of Practice for Timber Production 2014 (Code) , p. 23

6 Code, p. 32

2.2.2.7 **Rainforest** communities must not be harvested.

Glossary

'rainforest' means closed (>70 per cent projected foliage cover) broadleaved **forest** vegetation with a more or less continuous rainforest tree **canopy** of variable height, and with a characteristic composition of species and life forms, of at least 0.1 ha in area and 20 metres width. Rainforest includes closed transitional and seral communities, with emergent eucalypts, that are of similar botanical composition to mature rainforests in which eucalypts are absent.

'**precautionary principle**' means when contemplating decisions that will affect the environment, careful evaluation of management options be undertaken to wherever practical avoid serious or irreversible damage to the environment; and to properly assess the risk-weighted consequences of various options. When dealing with threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.[7]

Excerpts from: "Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014, The State of Victoria Department of Environment and Primary Industries 2014" (**MSP's)**

Glossary

'rainforest' as per Code definition. It is recognised as a distinct community from **mixed forest**.

'Sites of Significance for Rainforest' means areas depicted by DEPI in a corporate spatial layer which includes the most significant rainforest stands defined as Sites of Significance for Rainforest.

4.4 Vegetation communities

4.4.7 Rainforest canopy species

4.4.7.1 **Rainforest** canopy species are defined as shade tolerant tree and vine species which are able to regenerate below an undisturbed canopy, or in small canopy gaps resulting from locally recurring minor disturbances, such as isolated windthrow or lightning strike, which are part of the **rainforest** ecosystem. Such species are not dependent on fire for their **regeneration**.

4.4.7.2 In East Gippsland, Warm Temperate Rainforest canopy species are: Lilly Pilly (*Acmena smithii*), Kanuka (*Tristaniopsis laurina*), Sweet Pittosporum (*Pittosporum undulatum*), Blackwood (*Acacia melanoxylon*), Blue Olive- berry (*Elaeocarpus reticulates*), Muttonwood (*Myrsine howittiana*), Jungle Grape (*Cissus hypoglauca*), Boobialla (*Myoporum insulare*) and Yellow-wood (*Acronychia Ablongifolia*).

4.4.7.7 In all areas, forest **stands** that are dominated by single (contain over 50%), nondiverse stands of the following species and which contain few other rainforest characteristics, are not considered rainforest: Blackwood (*Acacia melanoxylon*), Mountain Teatree (*Leptospermum grandifolium*), Sweet Pittosporum (*Pittosporum undulatum*), Errinundra Pepper (*Tasmannia xerophila subsp. robusta*) or Mountain Pepper (*Tasmannia lanceolata*).

4.4.7.8 Eucalypts are not classified as broad-leaved rainforest species and therefore Eucalypts do not contribute to the projected foliage cover. Therefore **mixed forest** is not considered to be rainforest.

4.4.8 Rainforest field recognition and delineation

4.4.8.1 **Rainforest** is recognised in the field as forest where the projected foliage cover of the broadleaved tree **canopy** is greater than 70 % and is contributed by 1 or more of the canopy tree species listed above in sections 4.4.6.2 to 4.4.6.6 and where section 4.4.6.7 is not met.

7 *Code of Practice for Timber Production 2014*, pp. 11, 21, 23, 31-32, 34-35

4.4.8.2 Projected foliage cover is the proportion of ground covered by the vertical projection of foliage and branches from rainforest canopy trees. Any potential contribution of **understorey** species such as tree ferns is not counted toward assessment of projected foliage cover.

4.4.8.3 Linear **stands** are defined as stands of rainforest which are elongated and which are between 20m and 40 m wide. Linear stands of rainforest usually occur along **drainage lines** or small streams. Linear stands may be "overshadowed" by eucalypts from the adjoining eucalypt forest.

4.4.8.4 The minimum area for recognition of a rainforest stand is 0.1 ha and the minimum narrowest width is 20 m. (i.e. 20 m by 50 m).

4.4.8.5 Special care is required when assessing the presence and extent of rainforest where disturbance such as fire has temporarily removed the rainforest canopy or has created temporary canopy gaps. In cases where the canopy disturbance is less than ten years old[8]and further guidance as to the boundary of rainforest is required, the 'differential species approach' is to be used (Differential species keys for the delineation of rainforest boundaries can provide reference photos)[9].

4.4.8.6 Where the rainforest canopy is absent and there is little or no evidence of the **regeneration** of a rainforest canopy after 10 years following disturbance the 'differential species approach' should not be used to identify rainforest and the stand should no longer be considered to be rainforest.

4.4.8.7 Where the 'differential species approach' is utilised, the rainforest boundary is the point where the number of rainforest species equals the number of eucalypt forest species i.e. the line along which the **floristic** signals are of equal strength. This approach would be used where the rainforest canopy tree cover reduces gradually from 70% projected foliage cover. (gradual transition is a transition from 70% rainforest species projected foliage cover to 70% nonrainforest species projected foliage cover over a distance greater than approximately 10 meters).

4.4.9 Rainforest protection measures

4.4.9.1 Protect all rainforest from **timber harvesting operations** as follows:

(a) Exclude non linear **stands** that are 0.1 ha or more in size but less than 0.4 ha from **timber harvesting operations**. These stands do not require a **buffer**.

(b) Exclude linear stands that are at least 0.1 ha but are less than 0.2 ha from timber harvesting operations. These stands do not require a buffer.

(c) Exclude linear stands that are at least 0.2 ha but are less than 0.4 ha from timber harvesting operations. Protect these stands with a 20 m buffer.

(d) Exclude all **rainforest** stands (including linear stands) equal to or exceeding 0.4 ha from timber harvesting operations. Protect these stands with a 40 m buffer except for rainforest stands in the **Central Highlands FMAs** and the **Gippsland FMAs** where 3.4.8.2 below must be complied with.

(e) Distribute slash away from retained rainforest stands or buffers.

4.4.9.2 In areas categorised as being of National, State or Regional significance in the Sites of Significance for Rainforest spatial layer where evidence of rainforest is found in the field and it isn't already classified as SPZ, application must be made to the Secretary or delegate prior to commencement of the timber harvesting operation to create a SPZ in accordance with table 6 in Appendix 5 the Planning Standards.[10]

8 While the rainforest might not have recovered sufficiently to meet the >70% projected foliage cover criterion within 10 years of disturbance, there will be sufficient evidence to indicate whether rainforest canopy species are regenerating in a manner likely to result in the re-establishment of rainforest as they mature. In cases where rainforest is likely to re-establish the differential species approach should be used to identify the boundary with the adjoining forest and the stand should be protected as if it were rainforest.

9 Cameron D. (2011) A Field Guide to Rainforest identification in Victoria. Department of Sustainability and Environment.

10 *Management Standards*, p. 40

Excerpts 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" (**Planning Standards**)

Table 6 Buffer widths for Rainforest Sites of Significance by category and priority.

Site of Significance category	Priority			
	1	2	3	4
National	See 4.6.1.1	100 m	60 m	60 m
State	60 m	60 m	40 m	40 m
Regional	40 m	40 m	40 m	40 m

Note: Priority areas are identified in the Sites of Significance for Rainforest spatial layer.[11]

11 *Planning Standards*, p. 114

Conclusions/Discussion/Recommendations

Warm Temperate Rainforest

1. Within and adjacent to VicForests 44.83ha scheduled logging coupe 867-502-0007 (with approximately 10.64ha now logged) large areas of Warm Temperate Rainforest were identified, which though differentiated for the purposes of this report, when taken together as an entire stand, were at least 19.80 hectares (with 6.35ha within the coupe).

2. This rainforest is displayed in Results 3. Figure 2 according to the Legend of that map and the descriptions outlined in the "Results – Summary" above. A summary of the differentiated areas (by hectares) is provided in Table 1. below.

3. Table 2. below shows the areas of the minimum 40m vegetative rainforest buffers that should have been protected surrounding the rainforest areas and the proportion of these areas that have been damaged through logging operations in coupe 867-502-0007. This logging disturbance has occurred over a distance of approximately 1km.

Table 1.

	Differentiated area of rainforest (See "Results – Summary")	Area (ha)
(a)	*Minimum areas of mature rainforest or rainforest canopy species dominance*	3.54
(b)	*Minimum Rainforest Differential Species Extent*	0.25
(c)	*Rainforest Canopy Species Presence/transitioning with non-rainforest species*	0.40
(d)	*Mature Rainforest canopy species connecting less disturbed rainforest areas*	0.09
(e)	*Approximate rainforest extent estimate from on ground and aerial investigation*	14.98
(f)	*Expected rainforest differential species extent estimate (on ground/aerial investigation)*	0.52
(g)	*Damaged Rainforest/Damaged Rainforest Canopy Species*	0.02
	Total:	**19.80**

Table 2.

	Differentiated area of rainforest (See "Results – Summary") [within entire scheduled coupe 867-502-0007 extent]	Area (ha)	Area of logging disturbance within 40m buffer areas (ha)	% of 40m buffer area disturbed	% of approx. area logged (10.64ha) that is within a rainforest buffer area
(h)	*40m Buffer on "Minimum areas of mature rainforest/rainforest canopy species dominance"*	7.44	1.60	22%	15%
(I)	*40m Buffer on all rainforest stand areas*	10.16	2.92	29%	27%

4. The requisite 40m protected vegetative rainforest buffer to be placed around the entire and differentiated Warm Temperate Rainforest stand identified within coupe 867-502-0007 is shown in Results 3 Figure 2. as the "orange dashed- outlined" and "yellow solid-outlined" polygons.

5. Results 3 Figure 2. shows that VicForests and the contractors operating within coupe 867-502-0007 have logged up to the edge of and including areas of Warm Temperate Rainforest.

6. Approximately 1.60 hectares (or 22%) of the 40m buffer on the identified "Minimum areas of mature rainforest/rainforest canopy species dominance" (where it falls within coupe 867-502-0007) has been logged. This represents approximately 15% of the total area logged as occurring within a rainforest vegetative buffer.

7. Approximately 2.92 hectares (or 29%) of the 40m buffer on all the identified and estimated rainforest stand areas (where it falls within coupe 867-502-0007) has been logged. This represents approximately 27% of the total area logged as occurring within a rainforest vegetative buffer.

8. **The Department of Environment, Land, Water and Planning must prosecute VicForests and the contractors operating within coupe 867-502-0007 for logging within the mandatory 40m vegetative rainforest buffer. The Department must also ensure that no further logging is undertaken within rainforest or rainforest buffer areas within coupe 867-502-0007 and that all areas of rainforest are protected from the effects of logging including "regeneration" burns.**

Rainforest Sites of Significance

1. Scheduled logging coupe 867-502-0007 is located within a Regional Rainforest Site of Significance (Serpentine Creek, RSOS: EG87). As such the rainforest stand identified within this report must be protected with a 40m buffer and application must be made to the Secretary or delegate prior to comm

2. The designation of these sites of significance is based on the identification for protection of rainforest stands, and the sub-catchments which they are contained within, that support the best examples of extant rainforest throughout Victoria's distinct management regions. Many of these Rainforest Sites of Significance have experienced high levels of disturbance from logging prior to their designation as well as after their recognition as been of such high conservation value to be signalled out from all other stands of rare and threatened rainforest.

3. According to the LASTLOG25 spatial dataset (current to the beginning of 2014) the 1,031 hectare Rainforest Site of Significance (Serpentine Creek, RSOS: EG87) has historically had logging in at least 25% of its catchment area from ~20 logging coupes. A further ~172ha of logging are scheduled (with some now already undertaken) on the current VicForests Timber Release Plan within this RSOS. The result of this logging will leave up to 42% of the Rainforest Site of Significance degraded and fragmented from logging (this figure does not necessarily take into account the fragmentary impacts of already existent roads or the edge effects of prior or planned logging operations or historic or future fire events).

4. **The remainder of Serpentine Creek, RSOS: EG87, as well as all of Victoria's 432 RSOS's, should be fully protected from future planned disturbance by the exclusion of any future logging operations including those of scheduled logging coupe 867-502-0007.**