

## CONSERVATION COMMISSION OF WESTERN AUSTRALIA – REPORT ON THE OLD-GROWTH NOMINATION WITHIN ELLIS CREEK FOREST BLOCK

### **Summary**

- A request for a review of old-growth status over all of Ellis Creek forest block was received from a local conservation group in February 2007.
- It was determined at the time of receipt of the nomination to await the results of the Department of Environment and Conservation (DEC) dieback interpretation prior to accepting the public nomination (areas infected with *Phytophthora cinnamomi* do not comply with the definition of jarrah old-growth forest). Also undertaken at the time of the dieback interpretation was a survey of stump locations from previous logging disturbance.
- The dieback interpretation has now been undertaken. The area designated as 'dieback free' within the interpreted area constitutes the majority of the coupe area.
- The stump data provided by FPC has allowed a general distribution of past logging intensity to be mapped, this area is identified on the report maps as the 'Disturbed Area' (approximately 166 hectares). A significant proportion (approximately 185 hectares) of the proposed coupe appears to have no (or minimal) evidence of harvesting. Field assessment was undertaken by the Conservation Commission in a sample of approximately 50 hectares of the 'Disturbed Area'. The assessment yielded the following results:- 37% mature senescent proportion in the upper canopy and an estimated 13 stumps per hectare. The 'Disturbed Area' as mapped in this report does not meet old-growth requirements, and is therefore available for harvesting activities.
- The remainder of the coupe area which is outside the 'Disturbed Area' has no or minimal evidence of disturbance and with the exception of those patches which have dieback infection, this area does meet the uncut or minimal disturbance requirements for jarrah old-growth forest. This area has therefore been determined as unavailable for logging.

### **Background**

The basis for, and general description of, the Conservation Commission's role in assessing old-growth forest is provided in the Conservation Commission's paper *Assessment criteria and process for the Conservation Commission review of old-growth amendments*.

Of most relevance to consideration of old-growth within this forest type is the following old-growth definition for jarrah and jarrah/tingle forest:

"uncut forest or forest subject to minimal disturbance which is not known to be affected by *Phytophthora cinnamomi*".

The effects of disturbance are considered more than minimal where changes to the structure of the overstorey caused by these disturbances are still evident or where changes to the overstorey or understorey are irreversible.

### **Public nomination of old-growth**

As required in the Forest Management Plan 2004-13 (FMP) and further detailed in the Conservation Commission's paper *Assessment criteria and process for the Conservation Commission review of old-growth amendments*, there is a process for persons to request the Conservation Commission to assess whether areas on an indicative timber harvest plan should be classified as old-growth in DEC's corporate database. Such a request was received from the Bridgetown Greenbushes Friends of the Forest on 12<sup>th</sup> February 2007. Preliminary fieldwork was undertaken by the Conservation Commission and a dieback interpretation and stump analysis of the area was provided by FPC. This information indicated a variable level of logging and dieback disturbance, but with a clear indication of some old-growth. Notwithstanding the lateness of the nomination the Conservation Commission determined to accept the nomination and undertake detailed field assessment to ensure compliance with the State Government's *Protecting our old-growth forests policy* and the FMP.

This report summarises the Conservation Commission's findings based on its consideration of available records and inputs, and its own field survey.

### **Selection of sample locations and sampling process**

The coupe area was cross-checked and reviewed and a sample area was defined using the following background information:-

- Digitised aerial photos and data layers were utilized to remotely confirm obvious forest and non-forest structural boundaries and general observations in relation to forest structure;
- Conservation Commission sampling was not undertaken in the informal reserve buffer areas of the Bibbulmun Track, stream reserves and an area of less-well reserved vegetation complex as these informal reserves are unavailable for harvesting;
- Conservation Commission sampling was also not undertaken in the very steep section on the eastern side of the coupe as the FPC indicated that any proposed harvesting activities would be restricted to the central-western and elevated sections of the coupe (this area also incorporates regrowth forest over an old lease area which was apparently cleared for plantation establishment and not established);
- Stump survey locations as provided by FPC/DEC;
- Dieback mapping undertaken in 2007.

In accordance with the definitions for old-growth ("uncut forest or forest subject to minimal disturbance which is not known to be affected by *Phytophthora cinnamomi*"), the areas mapped as dieback infected were not sampled as these areas do not satisfy the old-growth definition.

Sampling incorporated the process outlined in the document *Assessment criteria and process for the Conservation Commission review of old-growth amendments*. The area was sampled at the higher of the documented intensities (approximately 25 sample point/plots per two hectares).

While DEC records in relation to harvesting indicate that the entire area of the coupe has been subject to harvesting, the stump analysis indicates that disturbance activities have been largely restricted to the elevated and less steep portions of the coupe area. The stump distribution also indicates that there is some variation in the

intensity of logging activities. The stump analysis map has been utilized as a primary data source for determining the need for further detailed field analysis including canopy sampling.

### ***Data analysis***

As shown in Map 1, an area has been derived from the stump data and field analysis and identified as the 'Disturbed Area' (approximately 166 hectares). It should be noted that the Conservation Commission inspection was undertaken with the aid of the stump location data and that during the inspection it was observed that while most stump locations had been accurately recorded it appeared that in a number of locations the presence of stumps had not been recorded. Following the Conservation Commission inspection supplementary stump location data was supplied for specific areas of the coupe by the FPC. The stump distribution shown in Map 1 includes all the stump data provided by FPC, however it is considered from the Conservation Commission's own inspection that this representation is likely to be an underestimate of the stump numbers within the 'Disturbed Area'. The difficulty in surveying the area for stump locations is acknowledged due to the very dense undergrowth and poor visibility in some parts of the area. Nonetheless, the overall distribution of the stump locations provided by FPC appears to accurately delineate the extent of past logging activity based upon the observations and sampling by the Conservation Commission, and for this reason the stump distribution map has been utilized to determine the boundary of the 'Disturbed Area'. Some small areas within the coupe area have few or no stumps due to a naturally very open canopy and should be more accurately represented as Diverse Ecotype Zones (a different category of informal reserve from old-growth forest).

After the inspection and sampling process it was determined to utilize the stump estimates derived from the Conservation Commission sampling process (detailed below and shown on Map 2) as it was considered that these estimates would provide a more reliable dataset for this analysis. This is important for the implementation of the Conservation Commission's old-growth assessment methodology as the presence of on-ground disturbance (e.g. between two and ten stumps per hectare) is the trigger for the requirement to undertake a detailed canopy analysis. Therefore, utilising the stump estimates for the overall analysis from the Conservation Commission sampling was considered the best available approach in this situation because of the poor visibility and the likelihood that:-

- the Conservation Commission sampling process was less likely to overlook the presence of stumps due to visibility issues;
- the sampling for stumps is integrated with canopy measures at each sample location.

### ***Conservation Commission sample results***

The locations of the sample points and the raw data collected have been incorporated into Map 2.

*Sampling in the north and east of the coupe area:-* No sampling was undertaken by the Conservation Commission in the north-eastern portion of the coupe as the FPC indicated that any proposed harvesting activities would be restricted to the central-western and elevated sections of the coupe. The results of the FPC stump survey indicate no or minimal disturbance in the north-eastern section of the coupe, however there are some areas in this location which appear to have been disturbed by the adjacent historical plantation activities and a related lease over a portion of this area.

The effects of these activities on the stump data (e.g. no stumps present due to clearing activities) needs to be analysed when final old-growth boundary refinement activities are undertaken.

*Sampling in the 'Disturbed Area' of the coupe:-* As noted above in the section pertaining to the selection of sampling locations, orthophotos were used to delineate areas within the stratified coupe area which appeared from visual estimates of crown structure to require detailed sampling. These areas can be identified from Map 2 as the areas where the most intensive sampling was undertaken. All areas of the 'Disturbed Area' (notwithstanding the areas which would remain unavailable for harvesting) were inspected however some sections were visually assessed for consistency with the observations from the intensively sampled areas of the coupe. The results presented in the table below are considered to be an accurate reflection of the level of disturbance and overall forest structure within the 'Disturbed Area'.

Sampling in the coupe yielded the following results:-

<b>Sample Area</b>	<b>Estimated total upper crown cover</b>	<b>Estimated upper crown proportion of mature or senescent trees</b>	<b>Estimated upper crown proportion of regrowth trees</b>	<b>Estimated number of stumps per hectare</b>
Samples within the 'Disturbed Area'	58%	<b>37.6%</b>	62.4%	13 stumps per hectare

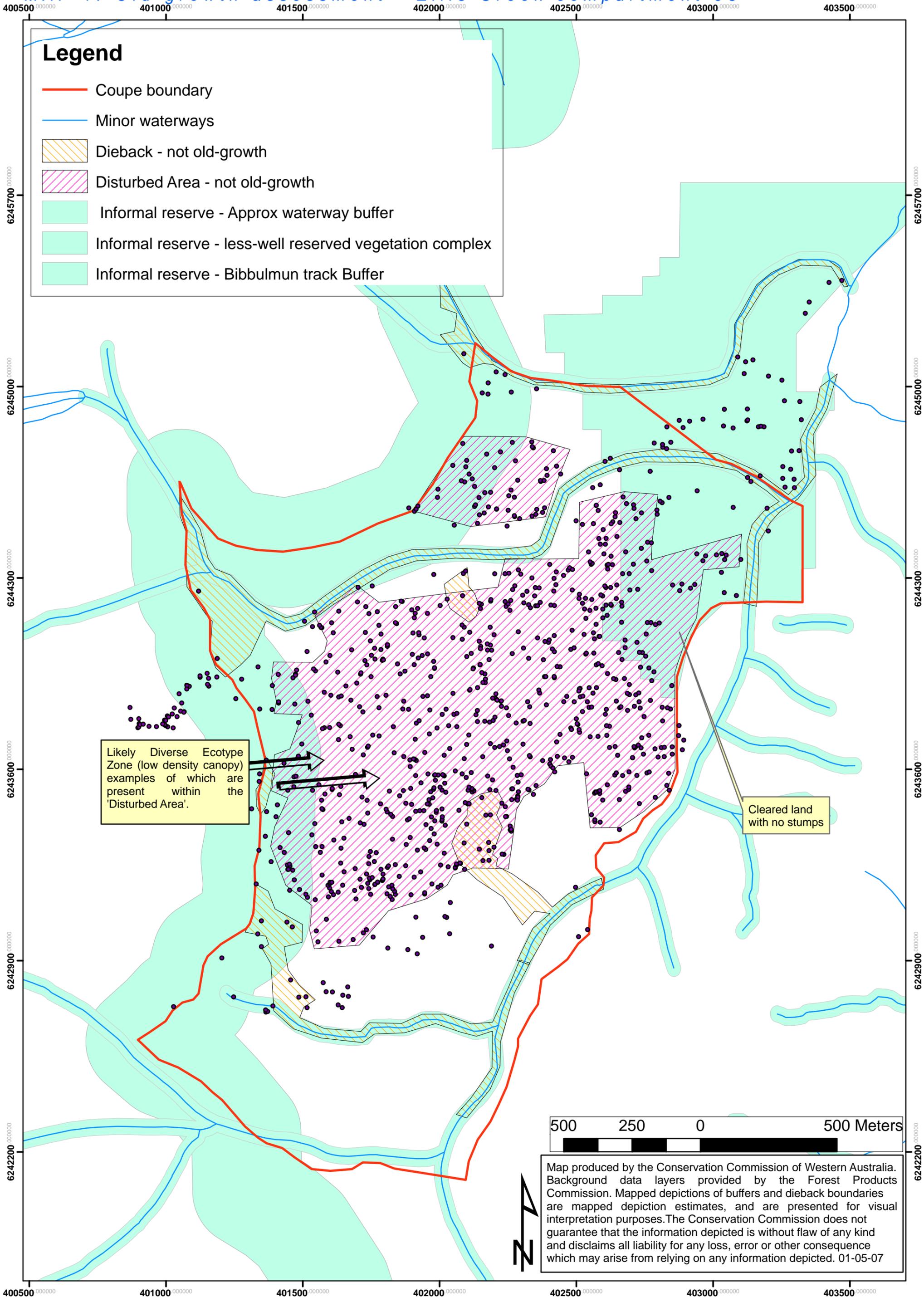
### **Finding**

Ground evidence of disturbance is clear from the presence of stumps and logging debris, however this disturbance is largely restricted to the areas shown on the stump distribution map within the 'Disturbed Area', as would be expected.

The result of this past disturbance is still evident in the upper canopy of the 'Disturbed Area', with a high estimated proportion of regrowth (62%) and a low estimated proportion of mature or senescent trees (38%). These figures contrast with the proportion of mature or senescent trees in uncut jarrah forest which consistently represents more than 50% of the upper canopy. Harvesting activities within the area designated as the 'Disturbed Area' can proceed based on the finding that this area is not old-growth forest.

The portion of forest outside the 'Disturbed Area' (approximately 185 hectares which is free from *Phytophthora cinnamomi*) but within the coupe area meets the uncut or minimal disturbance requirements for jarrah old-growth forest, and should be incorporated into the old-growth informal reserve. Boundary refinement activities both within and adjacent to this coupe should be undertaken to better define and protect old-growth forest in this area.

MAP 1. Old-growth assessment - Ellis Creek compartment 06



**Legend**

- Coupe boundary
- Minor waterways
- Dieback - not old-growth
- Disturbed Area - not old-growth
- Informal reserve - Approx waterway buffer
- Informal reserve - less-well reserved vegetation complex
- Informal reserve - Bibbulmun track Buffer

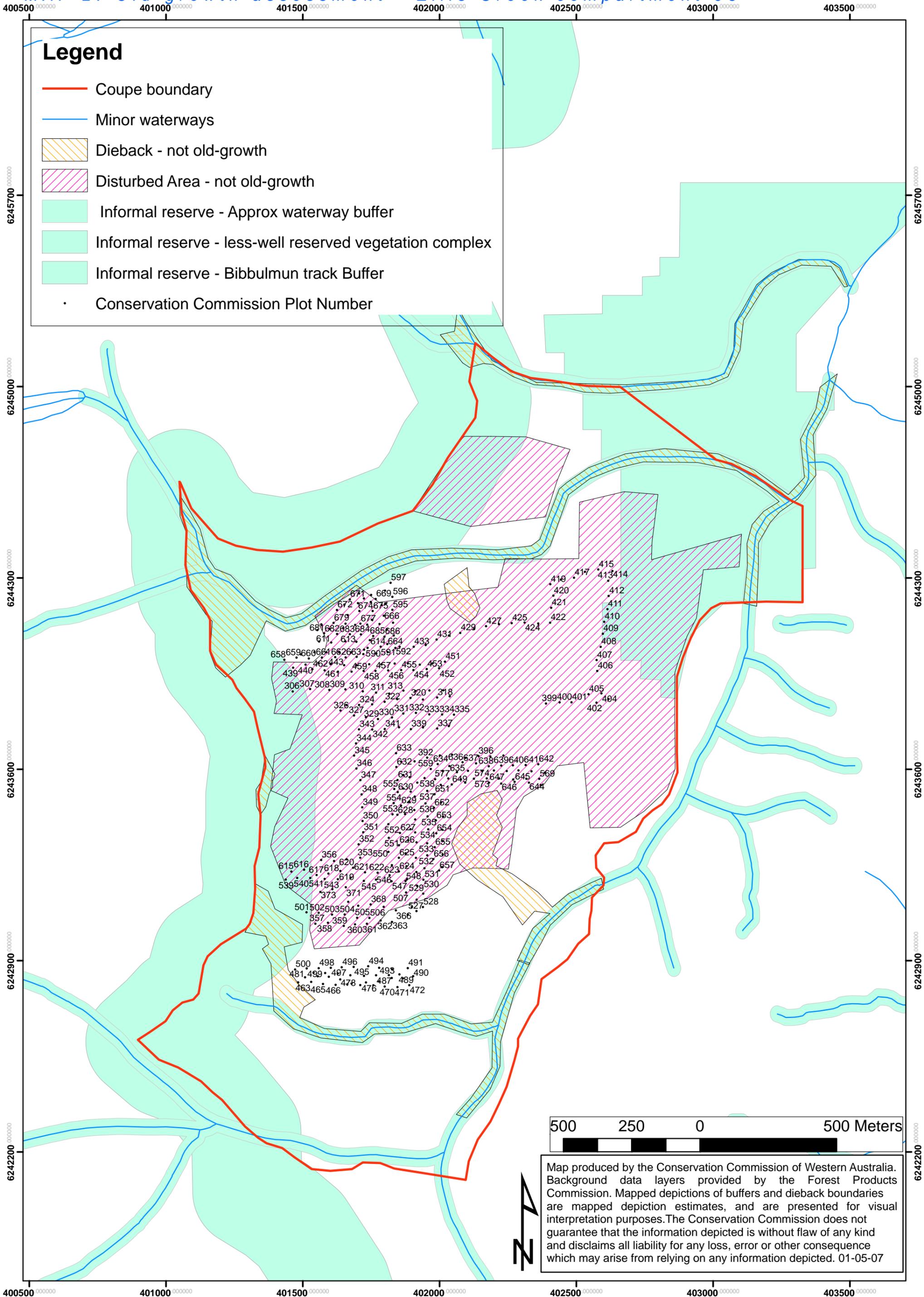
Likely Diverse Ecotype Zone (low density canopy) examples of which are present within the 'Disturbed Area'.

Cleared land with no stumps



Map produced by the Conservation Commission of Western Australia. Background data layers provided by the Forest Products Commission. Mapped depictions of buffers and dieback boundaries are mapped depiction estimates, and are presented for visual interpretation purposes. The Conservation Commission does not guarantee that the information depicted is without flaw of any kind and disclaims all liability for any loss, error or other consequence which may arise from relying on any information depicted. 01-05-07

MAP 2. Old-growth assessment - Ellis Creek compartment 06



**Legend**

- Coupe boundary
- Minor waterways
- Dieback - not old-growth
- Disturbed Area - not old-growth
- Informal reserve - Approx waterway buffer
- Informal reserve - less-well reserved vegetation complex
- Informal reserve - Bibbulmun track Buffer
- Conservation Commission Plot Number



Map produced by the Conservation Commission of Western Australia. Background data layers provided by the Forest Products Commission. Mapped depictions of buffers and dieback boundaries are mapped depiction estimates, and are presented for visual interpretation purposes. The Conservation Commission does not guarantee that the information depicted is without flaw of any kind and disclaims all liability for any loss, error or other consequence which may arise from relying on any information depicted. 01-05-07

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
306	YES	JARRAH	45	REGROWTH	0		MIXED	
307	YES	JARRAH	90	MATURE/SENESCENT	0		MIXED	
308	NO	GAP	0	GAP	0		MOSTLY LOWER	
309	YES	JARRAH	120	MATURE/SENESCENT	0		MOSTLY UPPER	
310	YES	JARRAH	25	REGROWTH	0		MIXED	
311	YES	MARRI	120	MATURE/SENESCENT	1		MOSTLY UPPER	
312	NO	GAP	0	GAP	0		MOSTLY LOWER	
313	YES	JARRAH	120	MATURE/SENESCENT	0		MOSTLY UPPER	
314	NO	GAP	0	GAP	0		MOSTLY LOWER	sheoak understorey
315	NO	GAP	0	GAP	0		MIXED	
316	YES	JARRAH	90	MATURE/SENESCENT	0		MIXED	
317	NO	GAP	0	GAP	0		MIXED	
318	YES	JARRAH	45	REGROWTH	0		MIXED	
319	YES	MARRI	40	REGROWTH	0		MIXED	
320	NO	GAP	0	GAP	0	TREEHEAD	MOSTLY LOWER	
321	NO	GAP	0	GAP	1	TREEHEAD	MOSTLY LOWER	sheoak understorey
322	YES	JARRAH	70	MATURE/SENESCENT	0	TREEHEAD	MIXED	
323	NO	GAP	0	GAP	0		MOSTLY LOWER	sheoak forest
324	NO	GAP	0	GAP	1		MOSTLY LOWER	
325	NO	GAP	0	GAP	0		MIXED	
326	YES	JARRAH	105	MATURE/SENESCENT	0		MIXED	
327	NO	GAP	0	GAP	0		MIXED	
328	NO	GAP	0	GAP	0		MIXED	
329	NO	GAP	0	GAP	0		MOSTLY LOWER	sheoak woodland
330	NO	GAP	0	GAP	0		MOSTLY LOWER	sheoak understorey
331	NO	GAP	0	GAP	0		MOSTLY LOWER	fire scarred
332	YES	JARRAH	25	REGROWTH	1		MIXED	
333	NO	GAP	0	GAP	0		MIXED	
334	YES	JARRAH	30	REGROWTH	1		MIXED	
335	NO	GAP	0	GAP	2		MOSTLY LOWER	
336	YES	MARRI	80	MATURE/SENESCENT	1		MIXED	
337	YES	MARRI	20	REGROWTH	1		MIXED	
338	NO	GAP	0	GAP	0		MIXED	
339	YES	JARRAH	105	MATURE/SENESCENT	0		MIXED	
340	NO	GAP	0	GAP	0		GAP	sheoak woodland
341	YES	JARRAH	85	MATURE/SENESCENT	0	TREEHEAD	MIXED	
342	YES	JARRAH	40	REGROWTH	0		MIXED	

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
343	YES	JARRAH	55	REGROWTH	0		MIXED	
344	NO	GAP	0	GAP	0		MOSTLY LOWER	sheoak
345	NO	GAP	0	GAP	0		GAP	black gravel balga
346	NO	GAP	0	GAP	0		GAP	black gravel balga
347	NO	GAP	0	GAP	0		MIXED	
348	NO	GAP	0	GAP	0		MIXED	
349	YES	JARRAH	95	MATURE/SENESCENT	0		MOSTLY UPPER	
350	YES	JARRAH	35	REGROWTH	0		MIXED	
351	NO	GAP	0	GAP	0		MIXED	
352	NO	GAP	0	GAP	0		MIXED	
353	YES	JARRAH	25	REGROWTH	0		MIXED	
354	YES	JARRAH	20	REGROWTH	0		MIXED	
355	YES	JARRAH	25	REGROWTH	0		MIXED	
356	NO	GAP	0	GAP	0		MOSTLY LOWER	
357	YES	JARRAH	110	MATURE/SENESCENT	0		MIXED	stump outside plot
358	YES	MARRI	25	REGROWTH	0	X-CUT LOG_	MIXED	
359	NO	GAP	0	GAP	0		MOSTLY LOWER	black gravel balga
360	YES	JARRAH	55	REGROWTH	0		MIXED	
361	NO	GAP	0	GAP	1		MIXED	
362	YES	JARRAH	45	REGROWTH	0		MIXED	
363	YES	JARRAH	45	REGROWTH	0		MOSTLY UPPER	stump outside plot
364	YES	MARRI	30	REGROWTH	0		MIXED	
365	YES	JARRAH	110	MATURE/SENESCENT	1	TREEHEAD	MOSTLY UPPER	
366	NO	GAP	0	GAP	1		MIXED	
367	YES	MARRI	30	REGROWTH	1		MOSTLY LOWER	
368	NO	GAP	0	GAP	0		MIXED	
369	NO	GAP	0	GAP	0	TREEHEAD	MOSTLY LOWER	stump outside plot
370	NO	GAP	0	GAP	1		MIXED	
371	NO	GAP	0	GAP	0		MOSTLY LOWER	stump outside plot
372	YES	JARRAH	40	REGROWTH	0	TREEHEAD	MOSTLY UPPER	stumps outside plot
373	NO	GAP	0	GAP	0		MOSTLY LOWER	
391	YES	JARRAH	60	REGROWTH	2		MOSTLY UPPER	
392	YES	JARRAH	25	REGROWTH	0		MIXED	
393	YES	JARRAH	65	MATURE/SENESCENT	0		MOSTLY UPPER	
394	YES	OTHER	25	REGROWTH	0		MIXED	
395	NO	GAP	0	GAP	0		MOSTLY LOWER	
396	YES	JARRAH	0	REGROWTH	1		MOSTLY LOWER	

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
397	NO	GAP	0	GAP	0		MOSTLY LOWER	
398	YES	JARRAH	60	MATURE/SENESCENT	1	SNIGTRACK	MIXED	
399	YES	JARRAH	30	REGROWTH	0		MOSTLY LOWER	
400	NO	GAP	0	GAP	0		MIXED	
401	NO	GAP	0	GAP	0		MOSTLY LOWER	
402	NO	GAP	0	GAP	1		MOSTLY LOWER	
403	NO	GAP	0	GAP	1		MOSTLY LOWER	
404	NO	GAP	0	GAP	0		MIXED	
405	NO	GAP	0	GAP	0		MOSTLY LOWER	
406	NO	GAP	0	GAP	0	SNIGTRACK	MOSTLY LOWER	
407	YES	JARRAH	20	REGROWTH	1	SNIGTRACK	MOSTLY LOWER	
408	YES	JARRAH	25	REGROWTH	0	SNIGTRACK	MOSTLY LOWER	
409	YES	JARRAH	20	REGROWTH	0		MOSTLY LOWER	
410	YES	MARRI	40	REGROWTH	1	SNIGTRACK	MIXED	
411	YES	MARRI	20	REGROWTH	0		MOSTLY LOWER	fenceline boundary
412	YES	JARRAH	40	REGROWTH	0		MIXED	
413	YES	JARRAH	45	REGROWTH	1	SNIGTRACK	MIXED	
414	NO	GAP	0	GAP	2		MIXED	
415	YES	JARRAH	55	REGROWTH	0		MOSTLY UPPER	
416	NO	GAP	0	GAP	0		MOSTLY LOWER	
417	YES	JARRAH	100	MATURE/SENESCENT	0		MOSTLY UPPER	
418	YES	JARRAH	110	MATURE/SENESCENT	0		MOSTLY UPPER	
419	YES	JARRAH	50	REGROWTH	0		MOSTLY UPPER	steep
420	YES	JARRAH	55	REGROWTH	0		MIXED	
421	YES	JARRAH	60	REGROWTH	0		MOSTLY UPPER	
422	NO	GAP	0	GAP	0		MIXED	
423	YES	JARRAH	30	REGROWTH	0		MIXED	
424	YES	JARRAH	55	REGROWTH	0	TREEHEAD	MIXED	
425	NO	GAP	0	GAP	0		MIXED	
426	NO	GAP	0	GAP	0		MOSTLY LOWER	dieback
427	NO	GAP	0	GAP	0		MOSTLY LOWER	
428	YES	JARRAH	30	REGROWTH	0		MIXED	stumps outside plot
429	YES	JARRAH	50	REGROWTH	0		MIXED	
430	YES	JARRAH	80	MATURE/SENESCENT	0		MOSTLY UPPER	
431	NO	GAP	0	GAP	0		MIXED	
432	YES	JARRAH	100	MATURE/SENESCENT	0		MOSTLY UPPER	
433	YES	JARRAH	30	REGROWTH	0		MIXED	high stump outside

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
434	YES	MARRI	80	MATURE/SENESCENT	0		MOSTLY UPPER	
435	YES	JARRAH	40	REGROWTH	0		MIXED	
436	NO	GAP	0	GAP	1		MIXED	
437	YES	JARRAH	95	MATURE/SENESCENT	0		MOSTLY UPPER	
438	YES	JARRAH	30	REGROWTH	0		MIXED	
439	YES	JARRAH	65	REGROWTH	0		MOSTLY UPPER	
440	YES	JARRAH	60	REGROWTH	0		MIXED	
441	YES	JARRAH	55	REGROWTH	0		MOSTLY UPPER	
442	YES	JARRAH	110	MATURE/SENESCENT	0		MOSTLY UPPER	
443	NO	GAP	0	GAP	1		MOSTLY LOWER	
444	YES	MARRI	95	MATURE/SENESCENT	0		MIXED	
445	NO	GAP	0	GAP	0		MIXED	
446	YES	JARRAH	0	MATURE/SENESCENT	0	X-CUT LOG_	MOSTLY UPPER	
447	NO	GAP	0	GAP	0		MIXED	
448	YES	JARRAH	110	MATURE/SENESCENT	0		MOSTLY UPPER	
449	YES	JARRAH	40	REGROWTH	0		MIXED	
450	NO	GAP	0	GAP	0		GAP	
451	YES	MARRI	60	REGROWTH	0		MOSTLY UPPER	
452	YES	MARRI	90	MATURE/SENESCENT	0		MOSTLY UPPER	white flagging east
453	YES	JARRAH	25	REGROWTH	0		MIXED	white flagging north
454	YES	JARRAH	115	MATURE/SENESCENT	1		MIXED	
455	YES	JARRAH	25	REGROWTH	1		MIXED	
456	YES	JARRAH	40	REGROWTH	0		MIXED	
457	YES	JARRAH	80	MATURE/SENESCENT	0		MIXED	
458	NO	GAP	0	GAP	0		GAP	
459	YES	MARRI	55	REGROWTH	1		MIXED	
460	NO	GAP	0	GAP	1		GAP	
461	NO	GAP	0	GAP	0		MIXED	
462	YES	JARRAH	100	MATURE/SENESCENT	0		MIXED	
463	YES	MARRI	55	REGROWTH	0		MOSTLY UPPER	
464	YES	JARRAH	70	MATURE/SENESCENT	0		MOSTLY LOWER	
465	YES	MARRI	50	REGROWTH	1		MOSTLY UPPER	
466	YES	JARRAH	50	REGROWTH	0		MOSTLY UPPER	
467	YES	MARRI	85	MATURE/SENESCENT	1		MOSTLY UPPER	
468	YES	MARRI	0	MATURE/SENESCENT	0		MOSTLY UPPER	
469	YES	MARRI	90	MATURE/SENESCENT	0		MOSTLY UPPER	
470	YES	JARRAH	69	REGROWTH	0		MIXED	

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
471	YES	MARRI	110	MATURE/SENESCENT	0		MOSTLY UPPER	
472	NO	GAP	0	GAP	0		GAP	
473	YES	JARRAH	75	REGROWTH	0		GAP	
474	NO	GAP	0	GAP	0	X-CUT LOG_	MIXED	
475	YES	MARRI	120	MATURE/SENESCENT	0		MIXED	
476	YES	JARRAH	105	MATURE/SENESCENT	0		MOSTLY UPPER	
477	YES	MARRI	100	MATURE/SENESCENT	0		MOSTLY UPPER	
478	NO	GAP	0	GAP	0		MIXED	
479	YES	MARRI	60	REGROWTH	0		MOSTLY UPPER	
480	YES	JARRAH	110	MATURE/SENESCENT	0		MIXED	
481	YES	OTHER	35	REGROWTH	0		MIXED	
482	YES	MARRI	40	REGROWTH	0		MIXED	
483	NO	GAP	0	GAP	0		GAP	
484	YES	JARRAH	100	MATURE/SENESCENT	1	X-CUT LOG_	MOSTLY UPPER	
485	YES	MARRI	35	REGROWTH	0		MIXED	
486	YES	OTHER	45	REGROWTH	0	SNIGTRACK	MIXED	
487	YES	MARRI	110	MATURE/SENESCENT	0		MOSTLY UPPER	
488	YES	MARRI	95	MATURE/SENESCENT	0		MOSTLY UPPER	
489	NO	GAP	0	GAP	0		MIXED	
490	YES	JARRAH	120	MATURE/SENESCENT	0		MOSTLY UPPER	
491	YES	MARRI	40	REGROWTH	0		MIXED	
492	NO	GAP	0	GAP	0	TREEHEAD	MOSTLY LOWER	
493	YES	MARRI	40	REGROWTH	1		MIXED	
494	YES	MARRI	25	REGROWTH	0		MIXED	
495	NO	GAP	0	GAP	0		MIXED	
496	YES	MARRI	60	REGROWTH	0		MIXED	
497	YES	MARRI	55	REGROWTH	0		MIXED	
498	YES	MARRI	45	REGROWTH	0		MIXED	
499	YES	JARRAH	30	REGROWTH	0		MOSTLY UPPER	
500	YES	JARRAH	0	MATURE/SENESCENT	0		MOSTLY UPPER	
501	NO	GAP	0	GAP	0		MOSTLY LOWER	
502	YES	MARRI	30	REGROWTH	0	X-CUT LOG_	MIXED	
503	YES	JARRAH	110	MATURE/SENESCENT	0		MOSTLY UPPER	
504	NO	GAP	0	GAP	0		GAP	black gravel
505	NO	GAP	0	GAP	0		MIXED	
506	YES	JARRAH	110	MATURE/SENESCENT	0		MOSTLY UPPER	
507	YES	JARRAH	85	MATURE/SENESCENT	1	TREEHEAD	MIXED	

Conservation Commission - raw sample data for Map 2

FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
508	NO	GAP	0		1	X-CUT LOG_	GAP	
509	NO	GAP	0	GAP	1		MIXED	
510	YES	JARRAH	20	REGROWTH	0		MIXED	
511	YES	JARRAH	45	REGROWTH	1		MIXED	
512	NO	GAP	0	GAP	0		MIXED	
513	NO	GAP	0	GAP	0		MOSTLY LOWER	
514	YES	JARRAH	90	MATURE/SENESCENT	1		MIXED	
515	YES	JARRAH	40	REGROWTH	0		MIXED	
516	YES	OTHER	90	MATURE/SENESCENT	0		MIXED	
517	YES	JARRAH	90	MATURE/SENESCENT	0		MIXED	
518	YES	JARRAH	25	REGROWTH	0		MIXED	
519	YES	JARRAH	95	MATURE/SENESCENT	0		MIXED	
520	NO	GAP	0	GAP	0		MIXED	
521	YES	JARRAH	105	MATURE/SENESCENT	1		MIXED	
522	NO	GAP	0	GAP	0		MOSTLY UPPER	
523	NO	GAP	0	GAP	0	X-CUT LOG_	MIXED	
524	YES	MARRI	130	MATURE/SENESCENT	0		MOSTLY UPPER	
525	NO	GAP	0	GAP	0		MOSTLY UPPER	
526	YES	JARRAH	40	REGROWTH	0		MIXED	
527	NO	GAP	0	GAP	0		MIXED	
528	YES	JARRAH	95	MATURE/SENESCENT	0		MOSTLY UPPER	
529	NO	GAP	0	GAP	2	TREEHEAD	MOSTLY LOWER	
530	NO	GAP	0	GAP	0		MOSTLY UPPER	
531	NO	GAP	0	GAP	0	TREEHEAD	MIXED	
532	YES	JARRAH	45	REGROWTH	1		MIXED	
533	YES	MARRI	90	MATURE/SENESCENT	0		MIXED	
534	NO	GAP	0	GAP	0		MIXED	stumps outside plot
535	NO	GAP	0	GAP	0		MIXED	
536	YES	JARRAH	75	REGROWTH	1		MIXED	
537	YES	JARRAH	40	REGROWTH	1	TREEHEAD	MIXED	
538	NO	GAP	0	GAP	0		MIXED	
539	YES	JARRAH	80	MATURE/SENESCENT	0		MIXED	
540	YES	JARRAH	60	REGROWTH	0		MOSTLY LOWER	STUMP OUTSIDE
541	YES	JARRAH	80	MATURE/SENESCENT	0		MOSTLY UPPER	
542	NO	GAP	0	GAP	1	X-CUT LOG_	MOSTLY LOWER	
543	YES	JARRAH	100	MATURE/SENESCENT	0		MIXED	
544	NO	GAP	0	GAP	0		MIXED	WINDTHOWS

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FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
545	YES	JARRAH	30	REGROWTH	1		MOSTLY LOWER	
546	YES	MARRI	40	REGROWTH	1	TREEHEAD	MOSTLY UPPER	
547	NO	GAP	0	GAP	0	TREEHEAD	GAP	OUTSIDE
548	YES	MARRI	30	REGROWTH	1	X-CUT LOG_	MOSTLY LOWER	
549	YES	JARRAH	70	MATURE/SENESCENT	0		MOSTLY UPPER	OUTSIDE
550	NO	GAP	0	GAP	0		MIXED	
551	NO	GAP	0	GAP	0		MOSTLY LOWER	
552	YES	JARRAH	40	REGROWTH	0		MOSTLY LOWER	
553	NO	GAP	0	GAP	1		MOSTLY LOWER	OUTSIDE
554	YES	JARRAH	70	MATURE/SENESCENT	0		MIXED	
555	NO	GAP	0	GAP	0		GAP	OUTSIDE DIEBACK
556	YES	JARRAH	80	MATURE/SENESCENT	0		MIXED	
557	NO	GAP	0	GAP	0		GAP	
558	YES	JARRAH	90	MATURE/SENESCENT	0		MIXED	OUTSIDE
559	NO	GAP	0	GAP	0		MOSTLY LOWER	
560	YES	JARRAH	100	MATURE/SENESCENT	0		MIXED	
561	NO	GAP	0	GAP	1		MOSTLY LOWER	
562	YES	JARRAH	50	REGROWTH	0		MOSTLY LOWER	OUTSIDE
563	YES	MARRI	40	REGROWTH	0		MOSTLY LOWER	
564	YES	MARRI	100	MATURE/SENESCENT	0	SNIGTRACK	MOSTLY UPPER	
565	NO	GAP	0	GAP	0		MOSTLY LOWER	BIG WINDTHROW
566	YES	JARRAH	30	REGROWTH	0	X-CUT LOG_	MOSTLY LOWER	3 STUNPS OUTSIDE
567	YES	MARRI	45	REGROWTH	0		MOSTLY LOWER	
568	YES	JARRAH	30	REGROWTH	0		MOSTLY LOWER	
569	YES	JARRAH	65	MATURE/SENESCENT	0		MIXED	
570	NO	GAP	0	GAP	1		MIXED	
571	YES	JARRAH	25	REGROWTH	1		MOSTLY LOWER	
572	YES	JARRAH	30	REGROWTH	0	SNIGTRACK	MOSTLY LOWER	
573	YES	MARRI	20	REGROWTH	0	SNIGTRACK	MOSTLY LOWER	
574	YES	JARRAH	40	REGROWTH	0		MIXED	
575	YES	JARRAH	45	REGROWTH	1		MOSTLY LOWER	
576	YES	JARRAH	30	REGROWTH	0	X-CUT LOG_	MOSTLY LOWER	
577	YES	JARRAH	25	REGROWTH	1		MIXED	
578	YES	JARRAH	90	MATURE/SENESCENT	1		MIXED	
579	YES	JARRAH	90	MATURE/SENESCENT	2		MIXED	
580	YES	JARRAH	45	REGROWTH	0		MIXED	
581	NO	GAP	0	GAP	0		MOSTLY LOWER	OUTSIDE

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FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
582	NO	GAP	0	GAP	1		MOSTLY LOWER	
583	YES	MARRI	0	REGROWTH	1		MOSTLY LOWER	
584	NO	GAP	0	GAP	0		MIXED	
585	YES	JARRAH	60	REGROWTH	0		MIXED	
586	NO	GAP	0	GAP	0		MIXED	
587	NO	GAP	0	GAP	0		MOSTLY UPPER	
588	YES	MARRI	90	MATURE/SENESCENT	0		MOSTLY UPPER	
589	YES	JARRAH	60	REGROWTH	0		MOSTLY LOWER	
590	YES	JARRAH	30	REGROWTH	0		MOSTLY LOWER	
591	YES	JARRAH	35	REGROWTH	0		MOSTLY LOWER	windthrow
592	NO	GAP	0	GAP	0		MIXED	
593	YES	JARRAH	85	MATURE/SENESCENT	0		MIXED	
594	YES	JARRAH	20	REGROWTH	1	X-CUT LOG_	MOSTLY LOWER	
595	YES	JARRAH	75	MATURE/SENESCENT	0	SNIGTRACK	MOSTLY LOWER	
596	YES	JARRAH	100	MATURE/SENESCENT	0		MIXED	
597	YES	BBUTT	120	MATURE/SENESCENT	0		MIXED	
598	YES	JARRAH	30	REGROWTH	0		MIXED	
599	NO	GAP	0	GAP	0		MOSTLY UPPER	
600	NO	GAP	0	GAP	1		GAP	
601	YES	JARRAH	35	REGROWTH	0		MOSTLY LOWER	
602	YES	JARRAH	45	REGROWTH	0	SNIGTRACK	MIXED	
603	NO	GAP	0	GAP	1		GAP	
604	YES	JARRAH	35	REGROWTH	1		MOSTLY LOWER	
605	YES	JARRAH	40	REGROWTH	1		MIXED	
606	YES	JARRAH	50	REGROWTH	0	X-CUT LOG_	MOSTLY LOWER	
607	NO	GAP	0	GAP	0		MOSTLY UPPER	
608	YES	JARRAH	25	REGROWTH	0		MIXED	
609	NO	GAP	0	GAP	0		MIXED	
610	NO	GAP	0	GAP	0	SNIGTRACK	GAP	
611	NO	GAP	0	GAP	0		GAP	
612	YES	JARRAH	25	REGROWTH	1	SNIGTRACK	MOSTLY LOWER	
613	NO	GAP	0	GAP	0	SNIGTRACK	MOSTLY UPPER	
614	NO	GAP	0	GAP	1		MOSTLY LOWER	
615	YES	MARRI	30	REGROWTH	1		MIXED	
616	NO	GAP	0	GAP	0		MIXED	
617	YES	JARRAH	45	REGROWTH	0		MIXED	
618	NO	GAP	0	GAP	1		MIXED	

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FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
619	YES	JARRAH	95	MATURE/SENESCENT	0		MOSTLY LOWER	
620	NO	GAP	0	GAP	2	X-CUT LOG_	MIXED	
621	NO	GAP	0	GAP	0		MOSTLY LOWER	
622	YES	MARRI	45	REGROWTH	0		MOSTLY UPPER	
623	YES	JARRAH	35	REGROWTH	1	TREEHEAD	MIXED	regrowth
624	YES	JARRAH	40	REGROWTH	0		MIXED	
625	NO	GAP	0	GAP	1		GAP	
626	YES	JARRAH	35	REGROWTH	1		MIXED	
627	YES	JARRAH	85	MATURE/SENESCENT	0		MIXED	
628	NO	GAP	0	GAP	0		MIXED	
629	YES	MARRI	35	REGROWTH	0		MIXED	
630	NO	GAP	0	GAP	0		MIXED	sheoak understorey
631	YES	JARRAH	90	MATURE/SENESCENT	0		MOSTLY UPPER	
632	YES	JARRAH	25	REGROWTH	0		MOSTLY LOWER	
633	NO	GAP	0	GAP	1		MIXED	
634	YES	JARRAH	20	REGROWTH	0		MIXED	
635	NO	GAP	0	GAP	0		MIXED	
636	YES	JARRAH	50	REGROWTH	1		MIXED	
637	YES	JARRAH	45	REGROWTH	0		GAP	
638	NO	GAP	0	GAP	0		MIXED	
639	YES	JARRAH	35	REGROWTH	1	SNIGTRACK	MOSTLY LOWER	
640	NO	GAP	0	GAP	1		MIXED	
641	YES	JARRAH	115	MATURE/SENESCENT	0		MOSTLY UPPER	
642	YES	MARRI	65	REGROWTH	0	TREEHEAD	MIXED	
643	YES	MARRI	95	MATURE/SENESCENT	0		MOSTLY UPPER	
644	YES	JARRAH	25	REGROWTH	0		MIXED	
645	YES	JARRAH	50	REGROWTH	1		MIXED	
646	NO	GAP	0	GAP	0		MOSTLY LOWER	
647	NO	GAP	0	GAP	0		MIXED	
648	YES	JARRAH	80	MATURE/SENESCENT	1		MIXED	
649	NO	GAP	0	GAP	1		MOSTLY LOWER	
650	YES	JARRAH	60	REGROWTH	1		MIXED	
651	YES	JARRAH	30	REGROWTH	1		MIXED	
652	NO	GAP	0	GAP	0		MOSTLY LOWER	
653	NO	GAP	0	GAP	0		MOSTLY LOWER	
654	NO	GAP	0	GAP	0		MIXED	
655	NO	GAP	0	GAP	0		MIXED	

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FID	CANOPY	SPECIES	DIAMETER	DEVELOPMENT	STUMPS	DISTURBANCE	QUALITATIVE	COMMENT
656	NO	GAP	0	GAP	0		MIXED	
657	YES	JARRAH	25	REGROWTH	1		MIXED	
658	YES	JARRAH	80	MATURE/SENESCENT	0		MOSTLY UPPER	
659	NO	GAP	0	GAP	0		MIXED	
660	NO	GAP	0	GAP	0		MOSTLY UPPER	
661	YES	JARRAH	40	REGROWTH	0		MIXED	
662	NO	GAP	0	GAP	1		MIXED	
663	YES	JARRAH	40	REGROWTH	0		MIXED	
664	YES	JARRAH	25	REGROWTH	0		MIXED	
665	YES	JARRAH	75	MATURE/SENESCENT	0	TREEHEAD	MOSTLY UPPER	
666	YES	MARRI	84	MATURE/SENESCENT	0		MOSTLY UPPER	
667	YES	JARRAH	55	REGROWTH	0	TREEHEAD	MIXED	
668	YES	JARRAH	100	MATURE/SENESCENT	0	TREEHEAD	MOSTLY UPPER	
669	YES	JARRAH	90	MATURE/SENESCENT	0	SNIGTRACK	MOSTLY UPPER	
670	NO	GAP	0	GAP	0	SNIGTRACK	MOSTLY UPPER	
671	NO	GAP	0	GAP	0		MIXED	
672	NO	GAP	0	GAP	0		MIXED	
673	NO	GAP	0	GAP	0		MIXED	
674	YES	JARRAH	75	REGROWTH	0	TREEHEAD	MIXED	
675	YES	JARRAH	75	MATURE/SENESCENT	0	SNIGTRACK	MOSTLY UPPER	
676	YES	JARRAH	25	REGROWTH	0		MIXED	
677	YES	JARRAH	95	MATURE/SENESCENT	0		MIXED	
678	NO	GAP	0	GAP	0		MIXED	
679	NO	GAP	0	GAP	0		MOSTLY LOWER	
680	NO	GAP	0	GAP	3		MIXED	
681	NO	GAP	0	GAP	0		MOSTLY LOWER	
682	NO	GAP	0	GAP	0		GAP	
683	YES	JARRAH	95	MATURE/SENESCENT	0		MIXED	
684	YES	JARRAH	55	REGROWTH	0		MIXED	
685	NO	GAP	0	GAP	0	TREEHEAD	GAP	
686	NO	GAP	0	GAP	0		GAP	