



## Obscured Data Hampers Assessment

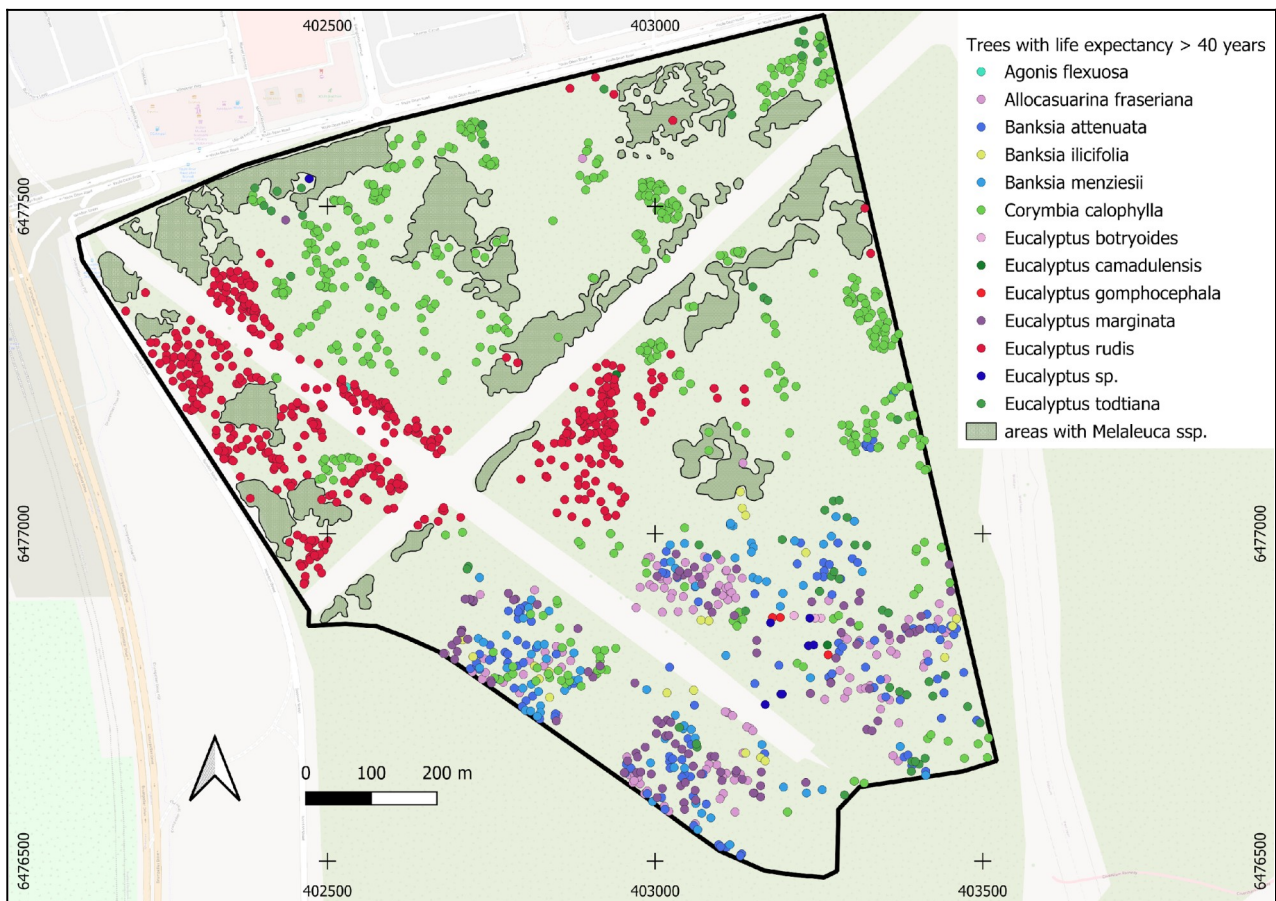
It is concerning that a present-day environmental report would try to justify the removal of the trees in the image<sup>1</sup> above. These trees, colour-coded according to species, have a life expectancy of more than 40 years and yet are deemed in the report to have only a low or moderate retention value. This article illustrates why inaccessibility to original data enables consultants to lead to such conclusions and highlights the importance of data accessibility and transparency, so that these conclusions can be scrutinised. We examine a current urban development proposal to highlight the issues related to the inaccessibility to and obscurity of original data.

To get approval for urban development, the conclusions made in expert reports must accurately reflect the data. In this article we examine the environmental report for the Brabham Stage 3, near Perth in Western Australia, development proposal, specifically the section of the report that discusses the native trees [1]. All the reports are in PDF format, but the raw data on which their conclusions are drawn are not available in digital form. It is impossible to analyse the raw data from a printed report; this can only be done with access to the raw data in digital form and using analytical tools. For example, the “tree inventory” data was included in the environmental report as printed tables. However, the data was not digitally available in a format ready for data processing. Therefore, we had to manually enter the raw data of the “tree inventory” into a spreadsheet. The time involved in manually entering the data is a barrier for people to dispute the conclusions made in the report. We conducted our own analysis of the data from this report and discuss these findings below.

Map 1 shows all the trees ( $n = 2049$ ) that have a life expectancy of more than 40 years. The different colours of the symbols represent the various species that were surveyed. It also shows

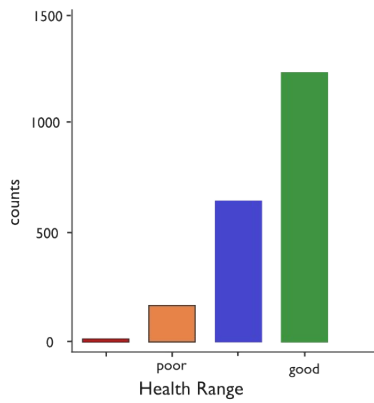
<sup>1</sup> A Nearmap aerial image of the Brabham Stage 3 development proposal in the centre, with Whiteman Park in the west and the Swan Valley in the east.

areas with *Melaleucas* where the trees have not been individually surveyed, but instead were located from aerial canopy mapping and these outlines were digitised from a map in the report. The report argues that all these *Melaleucas* have moderate retention value, however Figure 5 shows images of some healthy specimens. The area covered by *Melaleuca* comprises over 12 hectares, which means 12% of the total area in the report is painted with one brush stating that these trees are worth nothing.

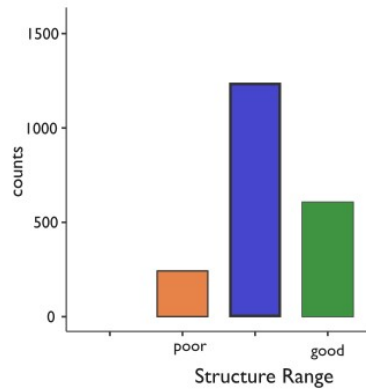


**Map 1.** This map of the Brabham stage 3 development proposal site shows all the trees with a useful life expectancy of more than 40 years and the areas of *Melaleuca* trees which were located by aerial image analysis.

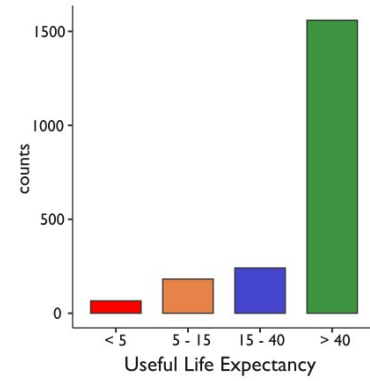
Descriptive statistics of the tree inventory data shows that 60% of the trees are in good health (Figure 1). The recorded structure of the trees provides 62% of moderate quality while 26% are in good structural shape (Figure 2). Health and structure of trees form the basis for the “useful life expectancy” of trees resulting in that more than 76% have a value of more than 40 years (Figure 3).



**Figure 1.** Tree Health

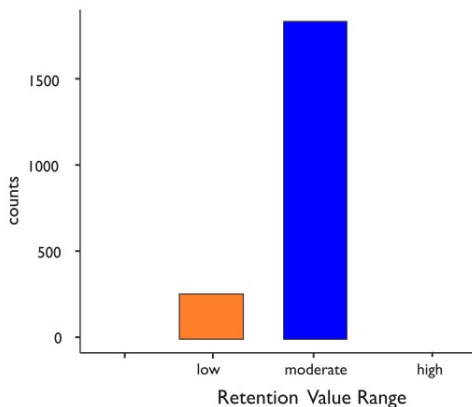


**Figure 2.** Tree Structure



**Figure 3.** Useful Life Expectancy

It is hard to understand why the tree retention values (Figure 4) were calculated as 14% (low) and 86% (moderate), with none high and why this report concludes that none of these trees are worth keeping. Our results indicate that there is no basis for the removal of all the trees, which we argue would have a devastating impact on the surrounding environment [2, 3]. Without access to the original data the above analysis could not have been completed. This shows the importance of data accessibility to enable others to double-check any conclusions.



**Figure 4.** Retention Values



**Figure 5.** Grove of healthy *Melaleuca preissiana*

## Financial Considerations

Another issue is that the report does not calculate the environment's monetary value. Trees have a monetary value and this value is commonly calculated for street trees by local councils. To put a value to the Brabham site trees, we used data from about 80,000 street trees in the City of Stirling [4, 5]. This is not an exact match, since environments and tree species are different, however it gives an indication of the magnitude of the monetary value. The extracted average value of street



trees are based on their useful life expectancy. These averages from the City of Stirling are multiplied by the number of trees in each useful life expectancy category at Brabham Stage 3 site. The total calculated value of the sites' individual trees is \$16,196,877 (Table 5). With no survey data available for the individual *Melaleucas*, we estimated their value based on the tree density. This estimation suggests that their combined value is \$2.5 million. Hence, from a financial viewpoint the removal of the trees reduces the asset base of the City of Swan [4, 5].

ULE	<5	5-15	15-40	>40	Totals
Mean Value	\$1,475	\$3,280	\$7,687	\$8,750	
Count	66	182	241	1,560	2,049
Average \$	\$97,350	\$596,960	\$1,852,567	\$13,650,000	<b>\$16,196,877</b>
Percent Value	1%	4%	11%	84%	

**Table 5.** Total tree values in dollars based on City Stirling values.

Furthermore, a life cycle assessment (LCA) was not carried out in this report. LCAs are a tool used to help with the financial assessment of a development project. The advantage of using an LCA is that it takes into account the impact on the environment for a proposed project and the costs beyond the completion date [6]. This process is not a standard procedure in environmental reporting, but with the climatic pressures we are facing, it is an important tool that helps all the parties understand better the impact of a development. It is all part of the Circular Economy or Cradle to Cradle approach [7]. If an LCA was conducted for this project, it would conclude that the environmental costs of the project are too high to proceed with the urban development.

## Environmental Impact

The climate crisis is not clearly considered in the decision-making regarding the bushland in the report. For example, there is no mention of how clearing of all this area will impact on the surrounding bushland, including the Bush Forever sites [8]. It is well documented that habitat loss and fragmentation are causes of significant drops in biodiversity [2, 3, 9, 10]. This particular bushland in Brabham forms an important wildlife corridor to the Swan River and yet the report fails to acknowledge its importance. This questions whether important data regarding the area's biodiversity was overlooked. Hence, to investigate the conclusion that it is acceptable to destroy this native bushland, it is important that the data is easily accessible. Additionally, there is no evidence that any 'trigger-based mechanisms' have been put in place in the site's urban planning process [11,

12]. Trigger based mechanisms are processes that indicate changes in tack are required when circumstances have changed, as is the case of the severity of the impacts of climate change.

## **Transparency**

Private, public and government organisations have transparency high in their governance banner. Transparency should involve making all urban planning data available in digital form to any party, including citizens, as this will help ensure sustainable development and environmental protection. This would also enhance a collaborative approach between citizens and governments [13,14]. In the case study of the Brabham development proposal discussed above, the data was in a PDF format and hence was not easily able to be analysed. This is one area of transparency that must be improved for the benefit of society [13, 14] and to improve government innovation [15]. It is a concern that government departments currently do not seem to have access to the digital data because this indicates their decisions are based on executive summaries alone, instead of their own analysis of the data.

## **Conclusion**

In this article, the example of the Brabham development proposal provides a contextual example as to why accessibility and transparency of original data is important. This is because the analysis of the original data showed that the recommendation in the report to destroy native bushland was flawed and contrary to further analysis. Our assessment could not have been done by simply visually scanning tabular data. It was necessary to use analytical tools on the original data. The article also highlights the lack of financial data in this report. Ultimately, we emphasize that access to free and unobscured digital data is vital in order to achieve environmentally sustainable outcomes in urban planning projects.

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