

Impact Zones by Urban Development on Bushland ¹

by

Humphrey Boogaardt

Native Bushlands will be impacted by new urban developments and road constructions. To quantify the cumulative effect of how much of the bushland is affected we use a multi-criteria analysis with variable bufferzones. For example, housing will have a different impact than a public openspace on the adjacent bushland, while light pollution will influence nature differently than sound.



Figure 1. Research area location. Brabham stage-3 proposed development.

¹ This is a summary document of a full paper in press.

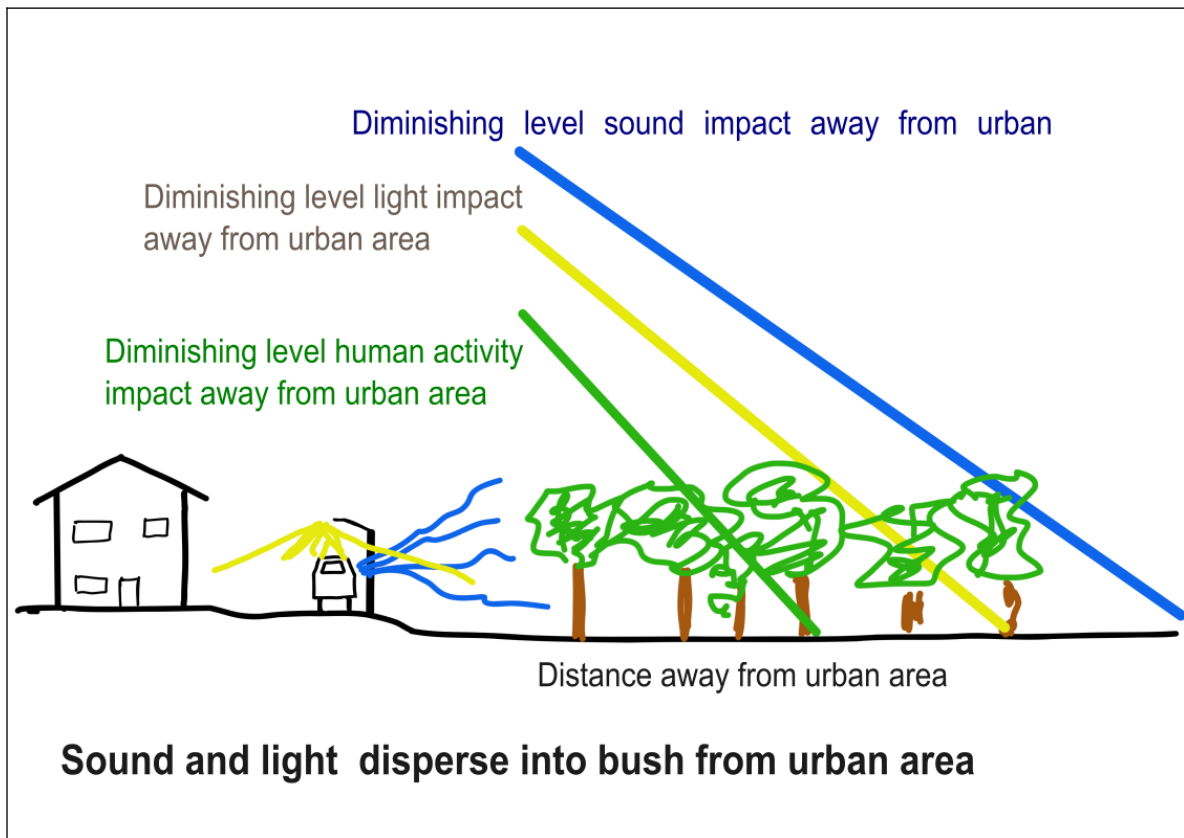


Figure 2. A schematic visualisation of impact buffer zones.

Type	Hierarchy	Lanes	Impact Distance		
			Sound (m)	Light (m)	Edge (m)
Roads	Local Connector	2	80	50	30
	Distributor B	4	80	50	30
	Distributor A	4	200	80	50
Railway			500	50	80
Housing			80	30	30
School			50	30	50
Oval			80	100	30
POS			50	30	30
Bushland			0	0	0

Table 1. Widths of bufferzones for the three variables relating to different entities. Size buffers based on interpretations of literature

The darker the red in the impact zone is where the cumulative effect is the highest of the parameters modelled (figure 3 & table 2).

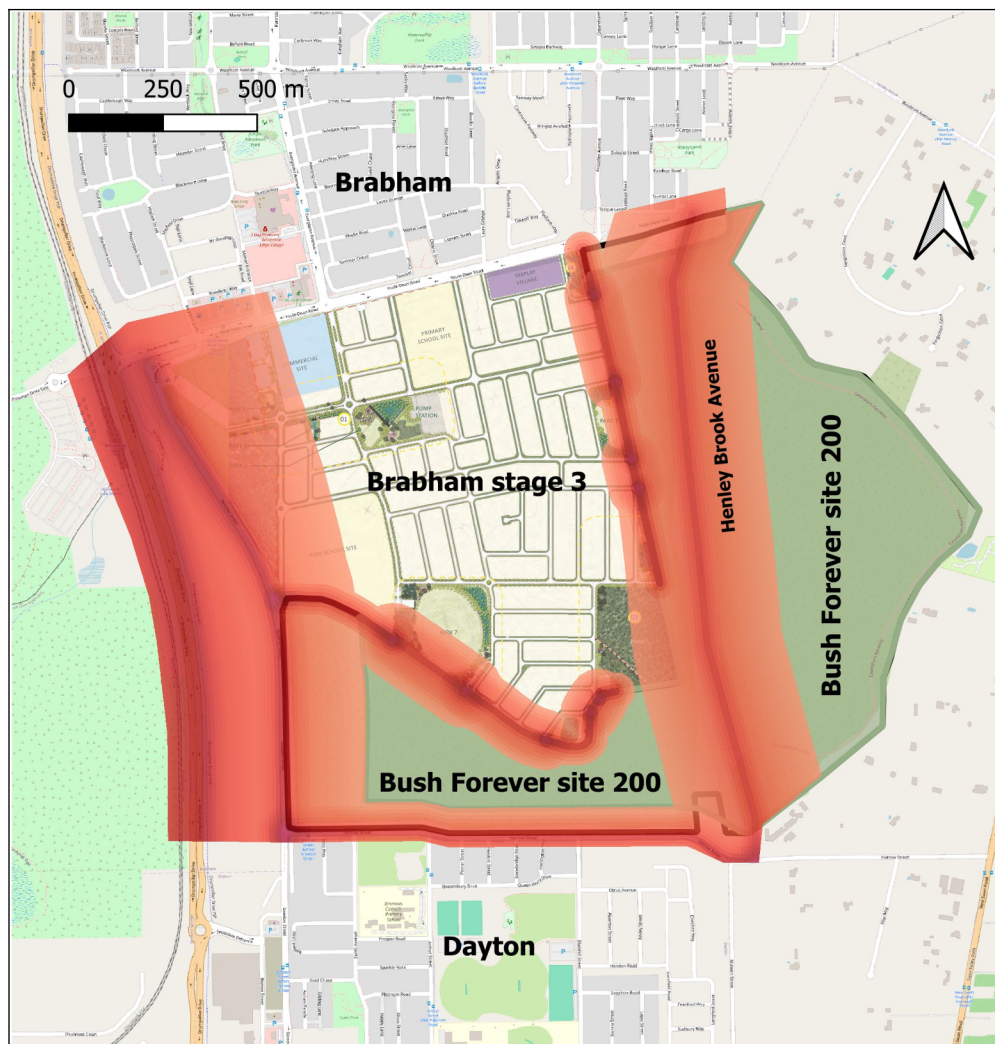


Figure 3. Anthropogenic impacts in grading red of existing and planned infrastructure and urban development on Bush Forever site 200.

Area	Area (ha)	Impact	
		(ha)	(%)
Bush Forever site 200	137	54	39
part west of HBA	63	16	25
part east of HBA	74	39	52

Table 2. Impact existing Urban development, roads and trains on Bush Forever as shown in figure 3.

If the proposed road and urban development are not carried out the results of the impacts are quite different as shown in figure 4 and table 3.

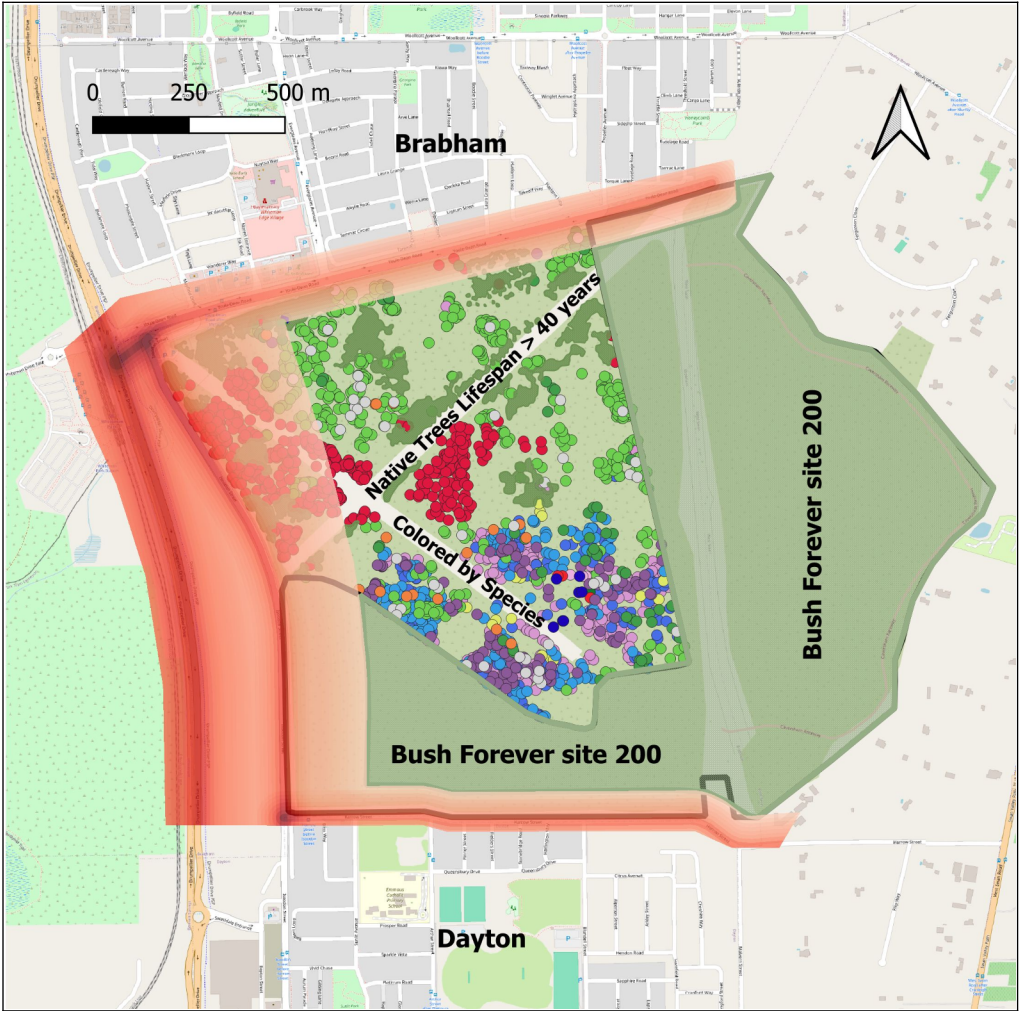


Figure 4. The anthropogenic impact if planned road not constructed and urban area not developed.

Area	Affected by	Area (ha)	Impact	
			(ha)	(%)
Bush Forever	Dayton + Drumpellier	137	21	15
Brabham stage 3	Brabham stage 2	100	16	16
Bush Forever + Brabham stage 3	Combined impact	237	37	16

Table 3. Impact Urban development and road construction on Bush Forever combined with Brabham stage 3 area as shown in figure 4.

Conclusion

The combined impact of the three variables – sound, light and edge effect – in combination with types of infrastructure indicates that these types of impacts can be quantified and visualised (fig. 3). The comparison with a scenario of no developments in figure 4 is a stark contrast. To have these different scenarios is important to highlight these impacts and make them understandable for non-spatial analysts. The modelling of these impact zone scenarios are an additional tool in the environmental assessment process.

This summary shows the potential impact of just three variables of urban and infrastructure development on native bushland. Biodiversity is under threat in the south west of Western Australia especially where so many species are under attack by human interference.

It is undeniable that this modelling shows the disastrous spatial extent of urban development can have on a native bushland. The visual presentation of various scenarios facilitates better decision-making while being backed up by calculation of the size of the spatial extents and we believe should be made compulsory.

Declaration

I confirm that generative AI technology (such as ChatGPT) was not used in the writing or editing of, or in the generation of any of the concepts and visualisations for, this report. 