

Population survey:

Aluta aspersa var. localis

Priority 2 species

1471 BAANDEE NORTH ROAD



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EXECUTIVE SUMMARY:

In October of 2018 I was tasked with surveying part of Baandee North Road on behalf of the Shire of Kellerberrin, at the behest of the Department of Water and Environmental Regulation (DWER). This was all in response to a Permit to Clear native vegetation application, which was lodged by the Shire of Kellerberrin.

During that survey, a Priority 2 plant, *Aluta aspersa* var. *localis* was discovered near a farm yard at 1471 Baandee North Road. Samples of the plant were sent to the Department of Biodiversity and Attractions (DBCA) for identification and verification. Before finalising the permit application, DWER advised that a population survey and population extent was required.

The plant which grows to approximately 1 metre at its' tallest and generally about 600 mm, is easily recognisable within its' ecosystem of mainly *Allocasuarina* woodland. The survey did not need to be done during the spring survey season and could be completed out of season. Hence the July survey timing. The survey, the majority of which was carried out on private bush remnants, identified the population extent and numbers.

By walking adjacent and parallel transects, quadrats of 10 metre squares and spot quadrats of 3 metres were selected at each occurrence of the plant. The 10 metre quadrats were selected when a population extending over a 10 metre square was found and spots were selected when only a few were found in a limited occurrence. For the majority of the survey, especially within 100 metres of the road, the transects were travelled at approximately 10 metre intervals, where bush density allowed. In the later stages of the survey, aerial photos were able to be interpreted as to where the occurrence was likely. By walking random transects through these areas to map the extent of the population, quadrats were recorded. At a later stage we were able to estimate the likely populations in the rest of the ecosystem.

Where the transects were walked on the roadside, plants which were within 5 metres of the roadside were recorded, even though only 3 metres would be cleared and are designated a vulnerable status.

In two instances, *Aluta aspersa* var. *localis* was found in dense thickets. The areas were GPS tracked, around the perimeter of the population and an estimate made, based on the area multiplied by the heaviest recorded quadrat of 87 plants per 100 square metres. Estimates of these two populations alone number approximately 2,500.

Remnant bush on both sides of the road extending north-west and west of the farm yards were carried out strictly within the 10 metre transect width methodology and every plant was counted, except for the two estimates sites. This area would cover the immediate 20 hectares either side of the road. 2,609 plants were counted, plus 2,500 estimated within the heaviest thickets making a total of 5,109 plants.

Vulnerable status was accorded to 20 individual plants within 5 metres of the presently constructed road, but depending on the nature of the disturbance more than half of these may still remain after works are concluded. The plants impacted are noted on the map below.

Plants at risk of clearing:



ALUTA ASPERA VAR. LOCALIS – THE PLANT

Aluta aspera var. *localis* is a perennial shrub, generally growing to a height of up to 1 metre, especially when young. As it matures it tends to a multi-stemmed shrub, often with up to 20 stems, originating from the stump of the plant. This habit sees it reduce its' height as it matures, and the stems adopt a drooping habit, where the end of the stem rests on the ground and the plant keeps growing at the tip vertically again. Most of the foliage is confined to the vertically growing tip. Mature plants can be wider than they are tall, up to 2 metres. The bark is fibrous and the stem adopts a tortured look to it, with twists and flutes. Eventually these stems rot at the base indiscriminately drop ping off that stem but not killing the plant generally.

Aluta aspera ssp localis:



Flowers are white in October and November, occurring in the node between stem and leaf. Flowers are small, 5-9 mm across. When dry many flowers stay attached to the plant and aid in identification outside of flowering season. Petals are opaque when dry and do not dessicate and fall off the seed pod. The seed pod is tiny, less than 2 mm in diameter and the back side of the seed capsule is shaped much like an acorn.

Leaves are 4 – 9 mm long and less than 1mm thick, slightly uncinatate and fleshy.

A more detailed taxonomic description can be found in Nuytsia, Volume 13, number 2, 2000.

Authors B.L. RYE and M.E. TRUDGEON, “Aluta, a new Australian genus of Myrtaceae”

VEGETATION ASSOCIATION

Aluta aspera var. *localis* grows in an area of varied soil types, but itself favours loamy yellow sand and quickly disappears as the soils tend to hard gravel or white sandy clays. The site which has been surveyed is generally gravelly in nature and described as *Allocasuarina* woodland to 5 metres. There are seams of yellow loamy sand throughout in what can only be described as alluvial deposits as a result of erosion in the upper slopes of the site.

Bordering this small ecosystem on all sides are Eucalypt stands as the soil changes. *Aluta* disappears from these areas. Where the gravel gets harder the *Aluta* thins to occasional single plants. Where the soil becomes deeper sand, the *Aluta* can occur in dense thickets. The highest score for a 10m x 10m quadrat was 87 individual plants. Where the soils are conducive to this plant, it is the dominant understorey species.

Allocasuarina acutivalvis is the dominant over storey plant within the search area, but *Allo. corniculata* and *Allo. campestris* also occur. In almost every quadrat and throughout the site *Astraloma serratifolium* occurs with *Aluta*. Other associated species include *Acacia neurophylla*, *Grevillea paradoxa*, *Melaleuca cordata*, *Baeckea exserta*, *Chamaexeros fimbriata*, *Schoenus* and *Lepidosperma* species.

At the margins, *Eucalyptus capillosa* to the west and south-west exists on hard stony white sandy clays. To the south east and south red sandy clays support *Eucalyptus rigidula* and *horistes*. Elsewhere the population is bounded by bare paddocks.

The survey site itself is highly disturbed, with old gravel pits, house and farm yards, outlying historical disturbances such as scattered rubbish dumps, old farm machinery. It is also possible that some areas have been cleared in the past and regrown. Where *Aluta* is in dominant thickets, prior clearing may have aided *Aluta* to dominate after re-establishment of its' population, as these dense thickets are adjacent to the established cleared farm yards.

METHODOLOGY

Pursuant to Department of Water and Environmental Regulation (DWER) correspondence, a detailed survey be carried out to determine population size and extent of *Aluta aspera* var. *localis*, a priority 2 plant, which was found during a previous survey of Baandee North Road.

The adjacent bush block and integrated farm yards, sheds, tracks and hard stands covered an area of 40 hectares. There are also historical disturbances such as gravel pits, public works disturbances for laying Telecom cables, prior clearing for fence lines and so on.

As the remnants bordered both sides of the Baandee North Road, transects were walked parallel to the road, working away from the road. The vegetation was not conducive to perfect straight lines and in some areas traversing the transect required numerous deviations off the preferred track. The transects were as close to 10 metres apart as possible, but it must be noted that visibility was at least 20 metres and more when the vegetation thinned out.

Aluta aspera var. *localis* was extremely identifiable by its' colour, height and growing habit. It was in no way detrimental to be surveying out of season because of these traits. In cases where it could be mistaken for other plants, close inspection revealed dried flowers and attached seed pods, which is a feature of this species; that it retains its' seed on the plant for up to a year. The only plant likely to be confused with *Aluta* was *Baeckea exserta*, which existed throughout but in vastly smaller numbers.

The survey was carried out over two days, the 9th and 11th of July 2019.

Each time a group of plants was found a 10 metre square quadrat was marked and the plants counted. Attachment 1 lists these quadrats which are identified by a Qnumber. Where a single occurrence or a few were in a small area with no plants evident close by, a 3 metre square was recorded as a Spot and recorded as a Snumber. Every plant was recorded on the first 6 Transects.

On two occasions an area was so thick with the plant that we marked and measured them for later reference, to be estimated.

After the first six Transects were done, we were very confident that we had identified the particular habitat that would support the Aluta. The last two Transects were wandering in and out of the ideal habitat. As these were well away from any possible disturbance, we considered that by counting plants on these Transects in Quadrats and Spots, we would be able to estimate the population within this very varied area. By referring to an aerial photograph as we carried out Transects 7 and 8, probable habitat could be identified and mapped and targeted. A reliable estimate of numbers has been made, based on the average density per hectare from the first 6 transects.

Transects 2,3,5 and 6 were carried out along the edges of Baandee North Road and individual plants at risk of clearing were identified within 5 metres of the edge of the partially constructed road. They numbered 20. They are identified in the Attachment 1 as R numbers and font is in red.

Attachment 1 only has the physical count and allocated Spot and Quadrat numbers. The sheer volume of information which was collected electronically is included in a data package and includes:

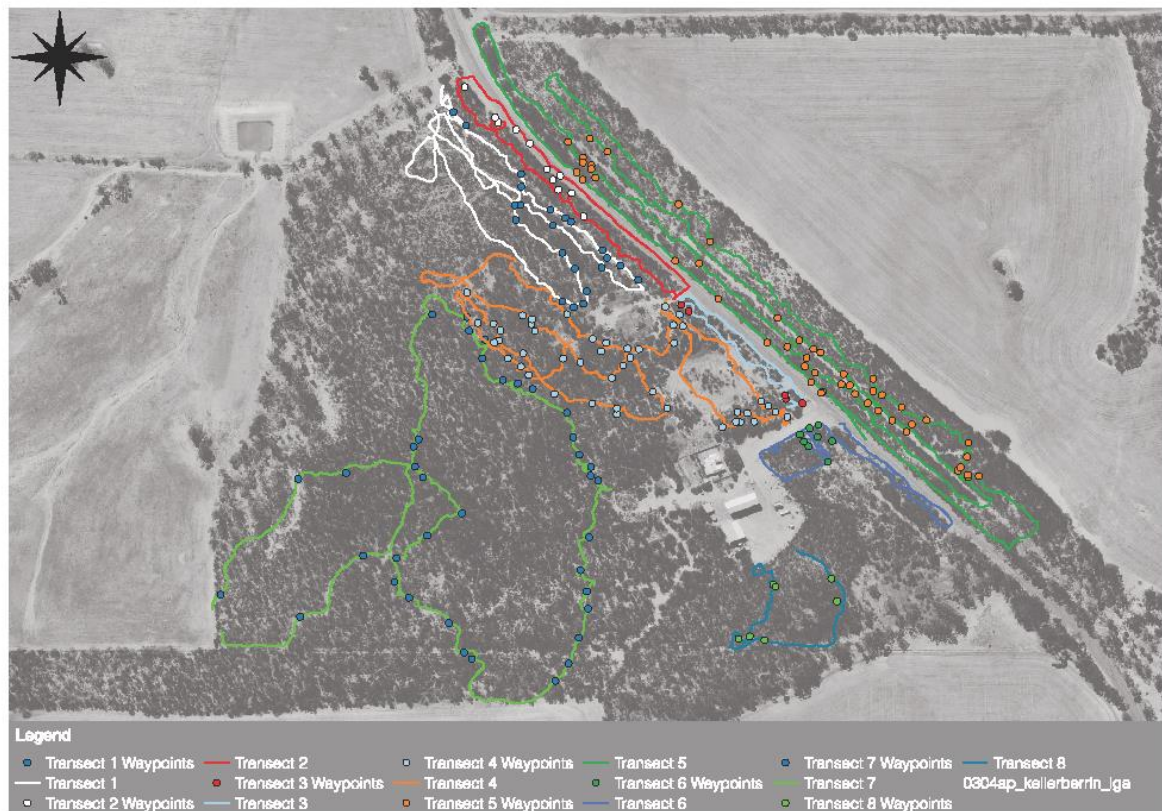
- GPS waypoint location of each Spot and Quadrat
- Photograph from photo point at north-east corner, but depending on terrain, the photo may have been forced to be taken along the line toward the North-West corner.
- Attachment 1 information is duplicated in the data package.

DISCUSSION

From Transect 1 to 6, the soil type and vegetation associations became very clear. Although we continued Transects into obviously clear soil types for Aluta, it was necessary to provide context to its' preferred soil. Transects 7 and 8, after establishing a healthy population already existed, were methodically different, in an attempt to map the extent of the population to the west and north-west extremities of the survey area and gather enough data to attempt a population estimate. There is no doubt it is a significant occurrence and in the preferred soil type, it is the dominant understorey plant.

Transects 1-6 was a detailed survey where every plant encountered was counted. Of the 40 hectares of the total site, 15 hectares was covered in this way. 2,609 plants were counted and 2,633 are reliably estimated from the two small purple polygons on the map. Within the 15 hectares which was covered, 5.5 hectares contained Aluta populations. This gives us a confirmed density of 474 plants per hectare of favourable habitat. In the two estimate areas densities are up to 5266 per hectare, based on continuous quadrats next to the estimate patches. In other areas only scattered individuals are found which reduces the average.

Map of transects detailing quadrat and spot locations:

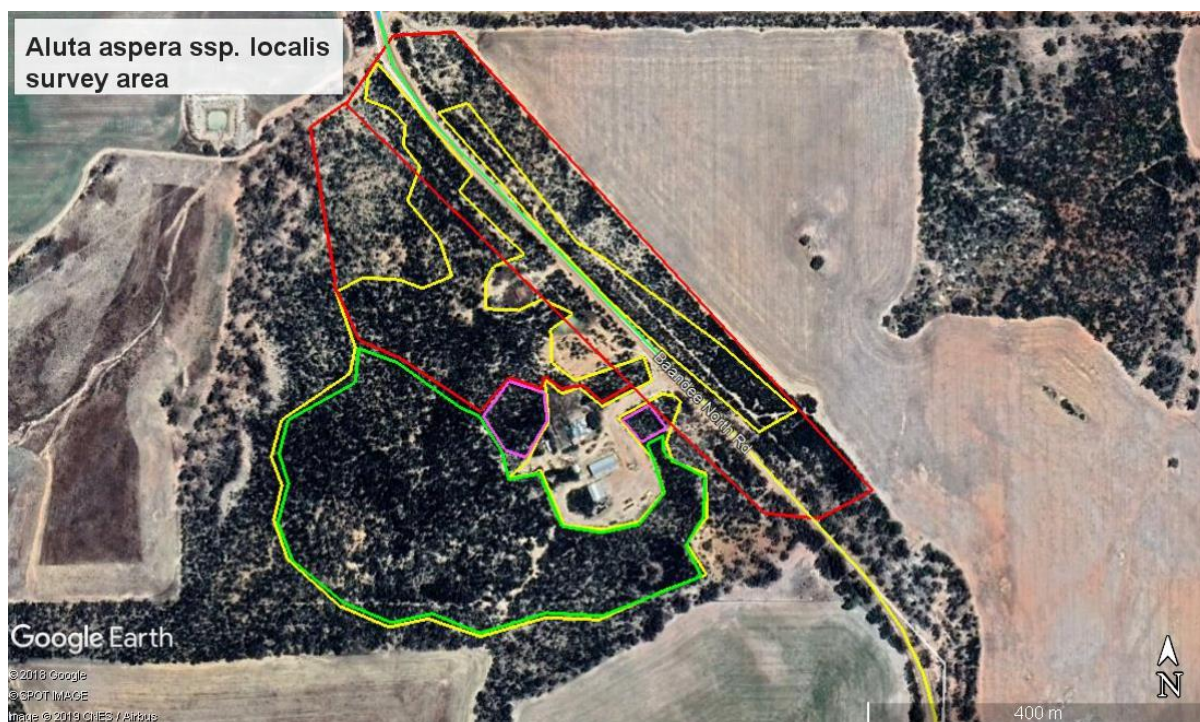


Attachment 1, in addition to Q and S numbers and populations found there, also has a column identifying the age of the plants. V – Varied age, Y – Young and M – Mature. A healthy mix of ages was recorded. In the heavy thickets especially, mature and young plants intermingled in no particular identifiable pattern. Isolated plants could be juvenile or very mature in any one site. These observations tend to support the theory that the seed is highly viable, germinating amongst mature plants as it does, but also germinating in isolation amongst mature *Allocasuarina* woodlands with no visible disturbance. It suggests that it could germinate in nursery situations quite easily and be added to the domestic native garden industry.

The owners of the private remnant within which the plant is found have the whole area of remnant fenced and the site is not able to be grazed. They are excited to have the plant on their property and are keen to protect the area from any further degradation. The population is secure in the respect that it will never be further cleared or disturbed by them.

SURVEY DETAILS AT A GLANCE

TOTAL AREA OF SURVEY		40 HA	PLANTS FOUND	ACCURACY
DETAILED TRANSECT AREA		15 HA	2,609 in 5.5 ha	98%
DENSE THICKETS ESTIMATED		0.5 HA	2,633	90%
WANDERING TRANSECT AREA. ESTIMATE.		9.3 HA	4,408 Ave 474/ha	90%
UNFAVOURABLE VEGETATION TYPE		21.7 HA	0	90%
CLEARED AREAS		3	0	90%
VULNERABLE PLANTS TO CLEARING			20	100%
POPULATION EXTENT		15.3HA	9,650	90%



CONCLUSION:

Aluta aspera ssp localis, a Priority 2 plant, exists as a very healthy population of approximately 9,660 plants on mostly private land at 1471 Baandee North Road. The road reserve also contributes some of that number. The plants on the road reserve which are vulnerable to clearing number 20 plants, half of which may survive clearing depending on the extent of the final works required to complete the road.

The population is stable, under no disturbance pressure other than the proposed road works and is dynamic in that it has plants aged between juvenile and mature, suggesting that the population is constantly regenerating. The associated vegetation habitat is in good condition, as is the Eucalypt margins where *Aluta* disappears from the vegetation mix.

ATTACHMENT 1:

BAANDEE NORTH ROAD ALUTA SURVEY				
9.7.19	WEST SIDE OF ROAD			
TIME STAMPS	QUADRATS & SPOTS	NUMBER OF PLANTS	AGE	
1026	Q1	4	M	Transect 1
	S1	1	M	
	S2	1	M	
	Q2	2	M	
	S3	16	V	
	S4	12	V	
1037	Q3	4	M	
	S5	1	M	
	Q4	6	M	
	S6	2	M	
	S7	1	M	
	Q5	2	M	
	Q6	6	V	
	S8	3	V	
	S9	1	M	
	Q7	3	M	
	S10	3	M	
	Q8	2	M	
1137	S11	3	M	SPOTS ON WEST SIDE VULNERABLE PLANTS
	Q9	8	Y	
	S12	7	V	
	R1	1	M	
	R2	2	M	
	R3	2	M	
	R4	1	M	
	S13	1	M	
	Q10	5	M	
	S14	7	M	
1157	Q11	1	M	Transect 3
	Q12	5	M	
	S15	1	M	
	S16	1	M	
	Q13	50	V	
	Q14	32	M	
	S17	6	V	
	S18	1	M	
	Q15	41	V	
	Q16	17	V	
	S19	8	V	
	S20	2	M	
				Transect 4

1327	Q17	61	V	
	Q18	87	V	
	Q19	52	V	
	S21	8	V	
	Q20	19	V	
	Q21	67	V	
	Q22	38	V	
	S22	4	M	
	S23	5	M	
	S24	3	M	
	S25	10	M	
	Q23	7	V	
	Q24	42	V	
	Q25	64	V	
1402	Q26	61	V	
	Q27	83	V	
	Q28	46	V	
	S26	9	M	
	Q29	37	V	
	S27	9	V	
	S28	5	V	
	S29	1	Y	
	Q30	0		ENTERED CAPILLOSA COUNTRY
	S30	3	M	
1432	S31	3	V	
	Q31	28	V	
	Q32	29	V	
	Q33	50	V	
	S32	12	V	
	Q34	52	V	
	S33	17	V	
	S34	3	M	
	Q35	7	V	
	Q36	11	V	
	S35	9	V	
	Q37	9	M	
	S36	1	Y	
	S37	2	M	
	Q38	13	V	
	Q39	17	V	
	S38	1	Y	DAY 1 FINISHED
		1257		TOTAL PLANTS FOUND
11.7.19				DAY 2 BEGINS (numbering starts at 1 again
934	R5	1	M	WEST ROADSIDE PLANTS VULNERABLE. Transect 5

1023	R6	3	M	VEG TYPE ENDS @ MALLEE
	R7	4	V	
	R8	1	M	
	R9	1	M	
	R10	1	M	
	R11	3	V	
	Q1	12	V	
	S1	1	Y	
	S2	2	M	
	S3	1	M	
	S4	1	Y	
	S5	1	Y	
	S6	1	Y	
	Q2	5	V	
	S7	3	V	
	Q3	2	M	
	Q4	7	M	
	Q5	19	V	
	Q6	27	V	
	Q7	10	V	
	S8	3	M	
	S9	2	M	
	S10	2	M	
	Q8	17	V	
	Q9	30	V	
	Q10	22	V	
	Q11	33	V	
	Q12	16	V	
	Q13	19	V	
	S11	2	M	
	S12	3	M	
	S13	1	M	
	S14	2	M	
1100	S15	2	Y	
	S16	2	V	
	S17	2	Y	
	S18	2	M	
	Q14	13	V	
	Q15	13	V	
	S19	2	Y	
	S20	3	Y	
	S21	1	M	
	Q16	8	V	
	Q17	14	V	EAST SIDE ROAD COMPLETE
	Q18	27	V	
	Q19	19	Y	

1248	S22	4	Y	BEGIN WEST SIDE ROAD SOUTH, Transect 6
	Q20	38	V	
	Q21	56	V	
	Q22	23	V	
	Q23	0		VEG TYPE CHANGE TO MALLEE
	Q24	54	V	
	Q25	48	V	
	Q26	50	V	
1303	Field estimate	500		ESTIMATED NUMBER IN TRACKED PATCH
1322	Q27	0		HARD GRAVEL, Transect 7
	Q28	0		
	S23	1	M	
	S24	1	M	
	S25	1	M	
	Q29	17	V	
	Q30	11	V	
	Q31	10	V	
	Q32	3	Y	
	Q33	16	V	
	Q34	43	V	
	S26	2	M	
	Q35	10	V	
	S27	2	Y	
	Q36	27	V	
1407	Q37	18	V	
	Q39	44	V	
	Q40	39	V	
	Field estimate	1000	V	ESTIMATE OF AREA 0.4 HECTARE, MAPPED
	Q41	69	V	
	Q42	46	V	
	Q43	31	V	
	Q44	12	V	
	S23	3	Y	
	Q45	15	V	
	Q46	33	V	
	S29	2	Y	
	Q47	37	V	
	Q48	62	V	
	Q49	32	V	
	S30	10	V	
	S31	3	Y	
	Q50	26	V	
	Q51	35	V	
	S32	2	Y	
	S33	1	M	
	Q52	0		

Q53	0		
Q54	0		CAPILLOSA COUNTRY
Q55	8	V	Transect 8
Q56	13	V	
S34	1	Y	
Q57	6	V	
Q58	11	V	
S35	3	V	
Q59	10	V	
	2855		