Arid bronze azure butterfly (ABAB) survey in Western Australia additional information

Survey Requirements

If a proponent requires an impact assessment within the potential distribution of the ABAB, then a systematic approach is required (Figure 1). An on-ground survey for ABAB may only be needed if the host ant is present in reasonable numbers.

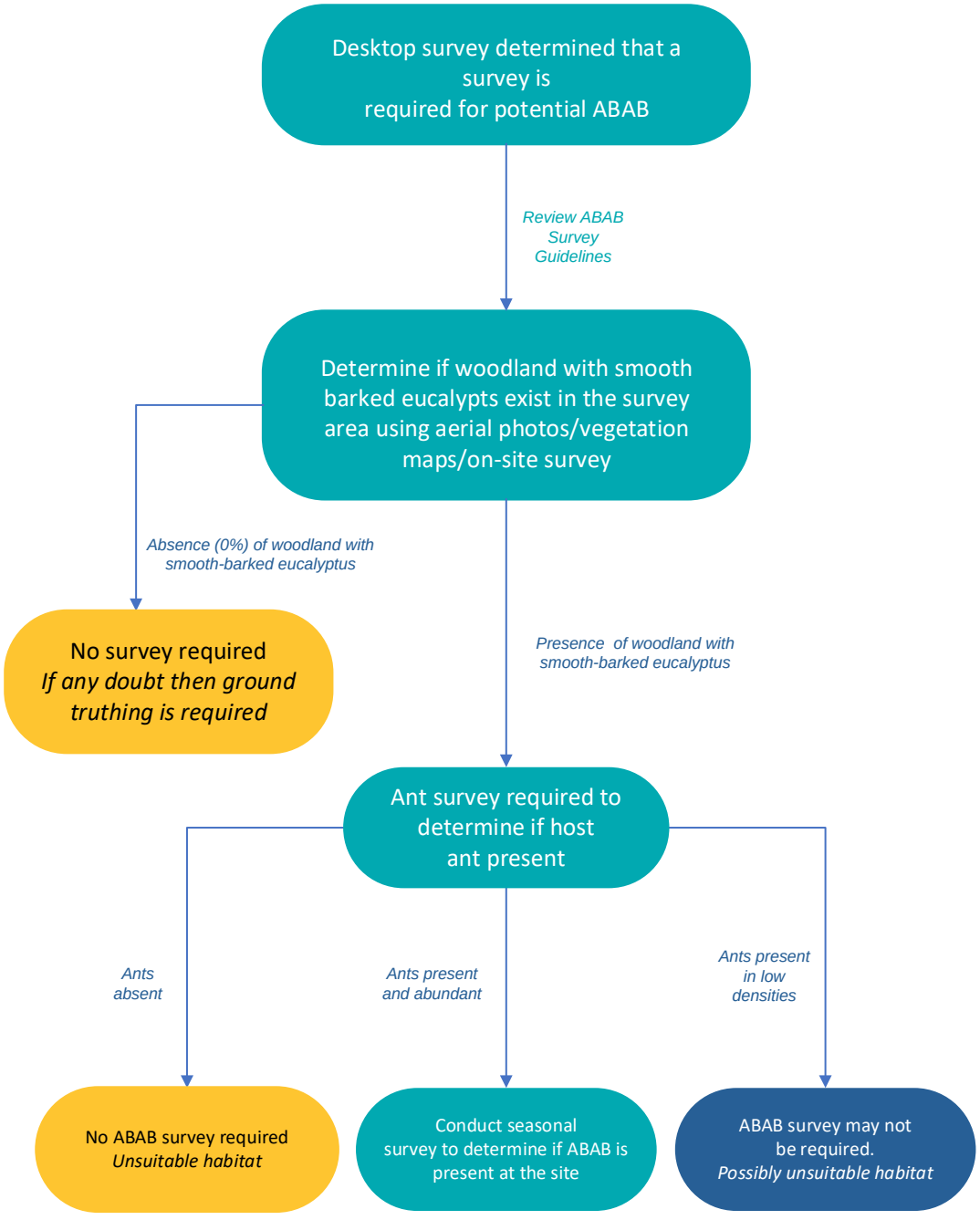

Figure 1. Decision tree for host ant and ABAB surveys. Every branch end of this decision tree should be reported back to DBCA

Survey Design

Using the sliding scale in Table 1, the minimum number of trees that need to be sampled and the approximate spacing between them can be determined from the area of woodland. The sample trees should be spread evenly throughout the site.

Once a suitable gird (number of trees x spacing) has been determined, the grid can be overlayed on a map or aerial photo of the site. The sampling or transect route locations can then be determined and pre-loaded into a GPS if required. When each sampling point is reached, the nearest smooth-barked eucalypt with one or more stems >10cm in diameter is chosen as the sampling tree. The following details should be recorded:

- Tree species if known (otherwise "smooth-barked eucalypt/mallee" will suffice)
- GPS location
- Tree diameter at 1.5m height
- Ant and leafhopper presence/absence

A recording sheet for host ant surveys is provided in Appendix 1.

Table 1: Sliding scale for determining the number of trees to sample for host ants and the spacing between trees in metres)

Site area (ha)	Approximate number of sample trees 10(√ha)	Approximate spacing (m) between trees √(area in m²/#sample trees)
1	10	30
5	25	50
10	30	55
20	45	70
50	70	80
100	100	100
150	120	110
200	140	120
500	225	150
1,000	320	180
5,000	400	200+
10,000	500	250+

For example, the site (Figure 2) is an area of woodland 316m x 316m and approximately 10ha. Using Table 1, approximately 30 trees are required for sampling with a spacing of 55m. The site can be divided into a grid of 6 x 5 trees transect lines to give 30 sample trees.

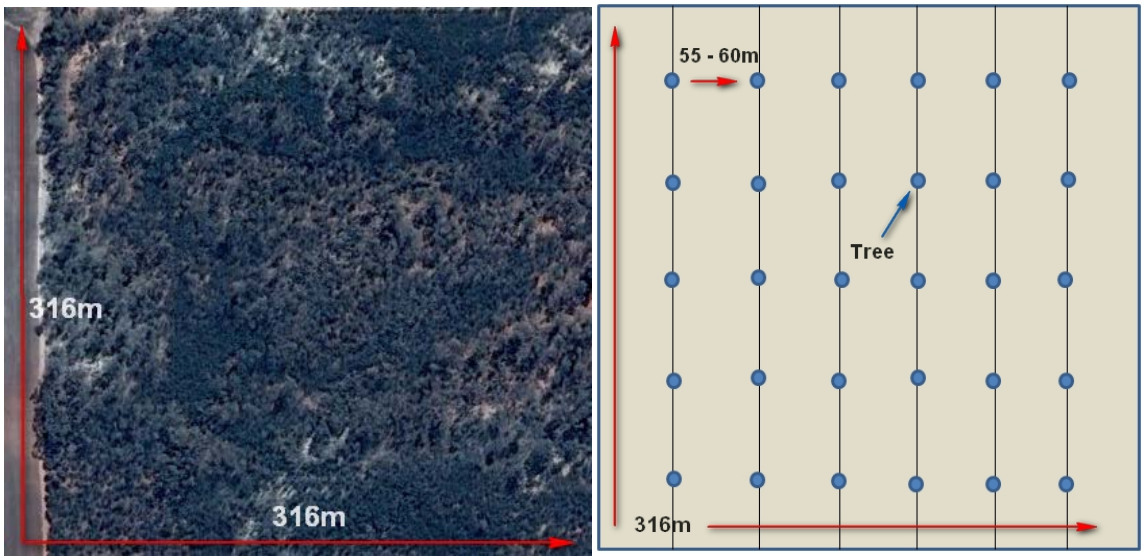

Figure 2. Aerial photo of 10ha woodland site with a grid of 30 sample locations to be superimposed. The nearest smooth-barked eucalypt to each sampling point is chosen as the sample tree.

Often areas of unsuitable habitat such as cleared land or *Allocasuarina/Acacia* thicket will need to be deducted from the total area of suitable woodland and sampling points and transect lines should work around these. For example, a site that is 1.4km x 1.4km (approximately 200ha), the table shows 140 trees need sampling. However, if 50ha of the site is thicket and/or cleared, there is only 150ha of potentially suitable habitat. The table suggests 125 sample trees with a spacing of ~110m. A potential sampling grid could be 11 transects x 10 trees or 10 transects x 11 trees, however this will need to be tailored to the site to avoid unsuitable habitat. If any roads or tracks are within or adjacent to the site, the survey grid should be adjusted to include these areas in the survey. Ants are often most abundant beside tracks and roads.

If the results of the host ant surveys show presence of the ants in reasonable numbers, then a survey for ABAB may be warranted. Recording sheets for ABA surveys are found in Appendix 2. Consult with the Species and Communities Program (fauna@dbca.wa.gov.au) at DBCA for advice.

Recording transect details

Before commencing each survey, record the following details:

- site name,
- date of survey,
- number and identify of observers,
- weather conditions – air temperature, wind speed and direction, estimate of cloudiness (% cloud cover), and
- the start and end time of transect which can be used to quantify survey effort.

At the completion of the survey, check the temperature, wind speed and direction and cloud cover and amend these to be the average for the survey. For example, if cloud cover increased from 0% to 50% at the end of the survey, amend this to 25%. **Remember to record the end time**.

Any ABAB detected should be photographed *in situ*, but, if this is not possible, butterflies should be caught with a butterfly net, placed in a specimen jar or suitable container, and photographed. They should then be released at the place of capture.

Appendix 1: Host ant survey recording sheet

Host ant survey recording sheet

Site name:	Page: _____ of
Date:	Start time:
Observers:	End time:
Temperature C˚:	Diurnal/Nocturnal
Comments:	

Tree	Species/type	Approx. diameter at 1.5m	Ants present? (Yes-abundant/Yes-few/No)	Leafhoppers present (Yes/No/NA)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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25				

Appendix 2: ABAB survey recording sheet

Arid Bronze Azure Butterfly survey recording sheet

Site name:	Page: _____ of
Date:	Start time:
Observers:	End time:
Temperature C˚:	Cloud cover %:
Wind direction:	Wind speed (km/hr):
Comments:	

ABAB	Easting	Northing	Male/Female/Unknown	Time
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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