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JOHNSTONE CENTRE OF PARKS,
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Report N° 19

**Site visibility and site survey bias in
cultural resource management**
A preliminary analysis of the 1993 survey re-
ports held by Aboriginal Affairs Victoria

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1. Introduction

In Australia, cultural resource management (CRM) agencies rely on commercial archaeological consultant companies to provide them with recommendations whether a proposed development will have an impact on the archaeological and tangible cultural resources of an area. The purpose of this brief study is to assess the effect site visibility has on the recommendations made by the consultants. It is *not* the aim of the report to go about pillorying companies or individuals.

Ethical CRM dictates that decisions of the fate of cultural resources are made based on the best and most complete available information and advice. Thus it is critical that the data review provided by the consultant is as reliable as possible and that inevitable gaps in the knowledge base (due to restrictions of site visibility for example) are clearly flagged.

To conduct the survey, the report library of Aboriginal Affairs Victoria, Albert Park, Melbourne was consulted. Only actual survey reports were used; desktop only studies are excluded as are excavation reports and accounts of subsurface testing. In total 32 reports were consulted: nos. 113, 427, 429, 458, 486, 594, 599a-e, 600, 601, 607, 612, 613, 615, 617, 618, 620, 627,

631, 633, 638, 640, 658, 659, 664, 665, 666, 673.

The report titles have been reproduced in the reference section. As some of the findings in this document may have or may be construed to have negative implications on individuals, the use of direct quotes from reports was eschewed to avoid having to name the sources.

A number of consultancy companies carried out the work, with duCros and Associates receiving the lion's share (47%).

Table 1. Reports by consultancy company

Company	N.	%
Clarkeology Pty Ltd	8	25.00
duCros & Associates	15	46.88
Practical Archaeology Services	2	6.25
Robert Paton Archaeological Studies Pty*)	1 (6)	3.12 (18.75)
V. Wood	1	3.12
Total	32	100.00

*) includes one summary report which for the purposes of this study was split into five sub-reports.

It should be made clear from the outset that this study was kept fairly general and that it did not evaluate each consultancy report in full depth.

Types and intensity of surveys

Of the 32 projects assessed in 1993, 75% were of a linear nature, mainly optical fibre cable routes (56%), roads (15.6%) and gas pipeline. Six projects (25%) were area projects, such as sewage farms and the like

(table 2.). The type of projects proposed by the developers, obviously predetermined to some degree the survey type chosen. It is quite possible that the analysis conducted in this report is biased due

to the high number of transect project (see further below for discussion).

Table 2. Frequency of projects (by type) reported in the AAV Survey Reports 1993

Project Type	N	%
Fibre-optic cable	18	56.25
Road construction	5	15.62
Gas pipeline	1	3.12
Quarry development	2	6.25
Housing development	2	6.25
Water/sewage plants	2	6.25
Farm development	2	6.25
Total	32	100.00

SURVEY TYPE

Forty-three percent of the surveys carried out were linear transect surveys, while 18.7% used a transect combined with areas and 9% used transects combined with small sample areas (table 3). Five projects sampled the areas to be surveyed (15.6%), while only 12.5% attempted a total area survey.

Table 3. Frequency of surveys (by type) reported in the AAV Survey Reports 1993

Survey Type	N	%
Linear Transect	14	43.75
Linear Transect & Sample	3	9.38
Linear Transect & Area	6	18.75
Sample survey	5	15.62
Total Area	4	12.50
Total	32	100.00

SURVEY MODE

The survey mode adopted by the archaeological consultants is partially determined by the type of survey. Nearly half the surveys conducted a windscreen survey with subsequent pedestrian inspection of promising areas. Another one used a bicycle instead of a car (table 4).

The other half of the surveys were conducted as 'traditional' pedestrian surveys with 6.25% restricted to the examination

of selected exposed areas or area likely to contain sites (purposive survey).

Table 4. Frequency of surveys (by mode) reported in the AAV Survey Reports 1993

Survey Mode	N	%
Bicycle reconn & selected pedest.	1	3.12
Pedestrian	14	43.75
Selected exposed & likely areas	2	6.25
Windscreen & selected pedest.	15	46.88
Total	32	

Table 5 shows the comparison of the type of survey with the mode of survey, which shows the expected correlation of linear transect surveys with the windscreen survey mode.

Table 5 Comparison of type of survey with the mode of survey..

	Bicycle Recon. & sel. ped.	Pedes trian	Sel. expo- sed areas	Winds creen & sel. ped.
Linear Tran- sect	1	2	2	9
Linear Tran- sect & Area	—	2	—	4
Linear Tran- sect & Sample	—	1	—	2
Sample survey	—	5	—	—
Total Area	—	4	—	—

Sel. Ped.—Selected pedestrian

The intensity of the survey was usually 100%, *i.e.* it was attempted to look at the whole area under consideration. Even though only some of the area may have been visible. One report indicated that 98.5% were targeted, while 5 reports failed to comment on the matter altogether.

AREAS SURVEYED

The areas surveyed ranged from 10.8 hectares to 390 hectares, with a mean of 89 ha. It is obvious that linear surveys are narrower but longer than area surveys. However, as shown in table 7, there is lit-

tle statistically significant variation between the survey types.

Table 6 Areas surveyed as reported in the AAV Survey Reports 1993

Minimum	10.8 ha
Median	88.97 ha
Maxium	390 ha
Mean	88.97 ha
Standard deviation	94.48

Table 7 Average area to be surveyed (by survey type) reported in the AAV Survey Reports 1993

Linear Transect	75.86 ± 82.69
Linear Transect & Area	96.88 ± 146.54
Linear Transect & Sample	119.33 ± 113.16
Sample survey	124.56 ± 94.95
Total Area	55.75 ± 28.85

The most important observation concerns the percentage of the areas actually sampled or surveyed. Half the reports do not report this value and thus do not permit the CRM specialist to assess whether the findings of the survey report are valid (table 8).

Table 8. Percentage of area sampled

%	n	% of surveys
??	16	50.00
<10%	1	3.12
11-20	3	9.38
21-30	1	3.12
31-40	0	0.00
41-50	1	3.12
51-60	0	0.00
61-70	1	3.12
71-80	1	3.12
81-90	0	0.00
91-99	0	0.00
100	8	25.00
Total	32	

A quarter of the reports claimed that the entire area was sampled or surveyed, while the remaining 25% showed varied coverage rates, ranging from less than 10% to nearly 80%. It needs to be considered that these figures only refer to the area surveyed or inspected, and that these figures do not reflect the area where ground visibility would actually permit the recognition of sites.

WHICH AREAS WERE TARGETED AND SEARCHED?

Several reports indicated that 'selected areas' were targeted for survey. The exposed areas targeted by the surveyors were erosion scars, cattle and other live-stock tracks, creek banks and tilled fields. Table 9 shows that erosion scars and cattle tracks were preferentially surveyed, with tilled fields and cattle tracks less frequent. The figures are reflect the expectations inasmuch purposive surveys are the norm in consultant's survey's It is somewhat disturbing to find that two reports fail to mention which areas where or were not surveyed.

Table 9. Frequency of exposures targeted for surveys.

	Yes	No	??
Tilled Fields	25	5	2
Erosion scars	30	0	2
Cattle tracks	30	0	2
Creek banks	22	8	2

Recording bias: what *can be* recognised?

As shown in table 8, the percentage of the areas sampled varies greatly and that half

the reports did not mention the percentage of the areas to be sampled. In this section we will look at the effective cover-

age achieved by the surveys, and the vegetation cover encountered.

EFFECTIVE COVERAGE

Table 10 shows the effective coverage encountered by the surveyors. Over a third of the reports did not calculate or quote the area actually covered by the survey. There is some inconsistency in the data showing that while some reports do not mention the total area actually surveyed, they tend to indicate that percentage actually visible.

Nonetheless, the figure of 34.5% of reports without any information on the area effectively covered does not instill faith in the assessability of the reports by office personnel. 80% of all reports either did not state it or had an effective coverage of less than 5% of the area, and only 6% of the reports indicated that the effective coverage was better than 15% (but less than 30%).

Table 10. Effective coverage (in % visibility of bare ground) of the 1993 surveys

% visibility	N	%	Cumul. %
??	11	34.38	34.38
0.01-0.9	1	3.12	37.50
1-1.4	3	9.38	46.88
1.5-1.9	0	0.00	46.88
2-2.4	2	6.25	53.12
2.5-4.9	9	28.12	81.25
5-7.4	0	0.00	81.25
7.5-9.9	2	6.25	87.50
10-14.9	2	6.25	93.75
15-19.9	1	3.12	96.88
20-24.9	0	0.00	96.88
25-30.0	1	3.12	100.00
Total	32	100.00	

VEGETATION COVER

All reports described the nature of the surface cover as mixed vegetation. The surface cover depend on the type of land use (pasture, tilled fields etc.), the time of year and the externalities, such as

droughts or recent occurrences of bushfires.

One report found the visibility "variable" found no sites and as a result recommended no further work.

Other reports tried to quantify the visibility.

Four reports did not comment at all on the level of visibility. All, however, found sites. Two reports recommended no further work, one recommended a watching brief for the construction period and one recommended further detailed survey work

Of the remaining 27 reports, all indicated that the average minimum visibility was zero, with the maximum ranging from 5% to 80%. Two reports do not specifically indicate whether sites were in fact found or not, but this can be inferred.

Table 11. Average maximum visibility encountered during the 1993 surveys and its relation to sites found

Visibility %	Sites found			Total
	yes	no	??	
5	3	0	0	3
10	5	6	2	13
15	0	1	0	1
20	5	3	0	8
24	1	0	0	1
80	0	1	0	1
Total	14	11	2	27

If sites are found, then an assumption can be made that further sites may well be present under those areas which could not effectively be surveyed because of the ground cover. In theory, this should be taken into consideration when drafting recommendations.

But how does the visibility level rellay affect the recommendations if no sites are found at all? Does the visibility enter into the considerations, and if so, is it explicitly stated in the reports?

Of those reports which found no sites, a recommendation of 'no further work' was given in three out of five cases where the

maximum visibility was 10%, and in all cases where the visibility was 15% (1), 20% (3) and 80% (1).

In the case of 15% visibility the recommendation included a watching brief for work crews in case burials are unearthed. The two cases where no site data are given also provide no recommendations.

Let us now turn to the cases where sites were found. Despite evidence of the presence of sites in the general area surveyed, two out of three surveys with a maximum of 5% visibility recommended no further work (one stipulated that care should be exercised by the work crews) and all five reports where the maximum visibility had been 20% recommended that no further work be executed.

A biased past, a biased future?

The above review has raised some serious ethical concerns on the practice of cultural resource management as the reports provide data on a varied basis, with some reports not permitting an independent assessment of the findings:

- 50% of the examined reports did not comment on the percentage of area covered in the survey;
- 34.5% of the examined reports do not mention the percentage of the area effectively covered;
- 12.5% of the examined reports did not comment on the surface visibility
- a fair number of reports recommend that no further work be carried out even though the surface visibility was very limited.

All these factors deny an independent assessor any chance of making an informed judgment.

In the light of such findings, then, the inevitable question arises: what is the ethical basis used for these reports?

The danger inherent in such practices is that cultural resources are destroyed without due consideration being given whether such sites should be preserved or

not, and if not, whether a data recovery exercise should be carried out.

However, the 1993 data should be read with caution as the bulk of the surveys were linear transect surveys conducted for the purposes of fibre-optic cable placements. It is possible that these surveys have introduced a survey-type specific bias—even though that should not reflect on the quality and completeness of reporting.

It is suggested that in 1995 a concerted analysis be carried out to assess all survey reports from 1990 to 1994 inclusive to see, whether the observations made in this report are borne out by the record, or whether 1993 was just a 'fluke' in the data.

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