Milestone 3 Report Project GVD-P-17-002

Traditional and contemporary fire patterns in the Great Victoria desert

N Burrows Department of Biodiveristy, Conservation and Attractions

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Milestone 3

i) Progress report on the project and the area analysed, including:

- *Update on the size and the location of the area analysed;*
- *Update on preliminary findings of fire scar mapping from the BSR data; and*
- *Summary of findings from interviews conducted by Spinifex Land Management (SLM) with key elders to determine traditional Aboriginal land burning practices in the West Australian GVD. If specialised follow-up with elders is deemed to be required, the Consultant will discuss with the Company Representative a potential variation to this contract, including for the Consultant's time and travel costs, or for those of their representative, for conducting additional interviews.*

Good progress has been made with acquiring and processing the earliest (1960/61) black and white aerial photography of the project area. As indicated in the Milestone 2 report, it was cost prohibitive to acquire and then process photography for the entire ~5.4 M ha of the Spinifex People Native Title area (about 1,131 non-stereo, non-georeferenced photos). Depopulation, displacement and migration of Aboriginal people in the Great Victoria Desert commenced in the 1940s (and perhaps earlier) and accelerated into the 1950s, so it is likely that in the years prior to the aerial photography, only a few scattered groups remained. Photography was acquired over selective areas where these people may have been extant and living a traditional lifestyle just prior to the photography from best available evidence (see Milestone 2 report). A total of 181 photos covering an area of ~896,509 hectares, or 16.5% of the Spinifex Lands, are being processed (Table 1). Because of the high overlap of consecutive photos, and to reduce costs, every second photo was selected from each run. This provided sufficient overlap between photos to enable them to be rectified and 'stitched' together to form a continuous map or mosaic. The process of georeferencing and stitching the photos together took some 40 hrs of work at a cost of $2,800. Figure 1 shows the location of the aerial photos in relation to the Spinifex Lands. If funding permits, I am considering extending the coverage of the northern and central block of aerial photography, further to the west.

The next step is to commence the process of identifying and mapping fire scars on the 1960/61 aerial photography now that it is 'tiled' and rectified, and generating relevant fire scar metrics and statistics.

Analysis of contemporary fire patterns using Landsat satellite imagery is near completion, with the final task being to summarise fire pattern statistics generated from the imagery including location of fires with respect to major land systems and vegetation types, which systems have not burnt / do not burn, annual area burnt, fire size, shape and patchiness metrics and associated statistics. The cost of this operation was $4,800. A field trip was planned to a) validate the satellite fire scar history mapping to quantify its accuracy, b) to describe, characterise and map (based on satellite interpretation and ground truthing) the flammability of the various vegetation types and c) to talk with Traditional Owners about aspects of traditional use of fire. Unfortunately the field trip had to be cancelled due to a

chronic back injury to myself. I am unlikely to be well enough to undertake field work in the next 2-3 months. I will re-assess whether I am able to undertake the field work once I have recovered, and whether it is do-able in the context of the time frame of this project. While some helpful descriptive work has been undertaken by anthropologists and general ecologists, I have expertise as a bushfire scientist, having spent three decades studying bushfires in spinifex-dominated deserts, so have an in depth understanding of fire behaviour and patterning in these landscapes, and of the relationships between fire behaviour, weather, topography, vegetation and fuel dynamics.

Map Sheet	Run	Number of photos
Waigen	9-12	32
Wanna	5-13	70
Jubilee	1-4	28
Vernon	16-18	21
Mason	2-6	30
	TOTAL	181

Table 1: Summary of 1960/61 aerial photography acquired over the Spinifex Lands to attempt to reconstruct traditional burning patterns. Area covered by the photography is 16.5% of the Spinifex Lands.

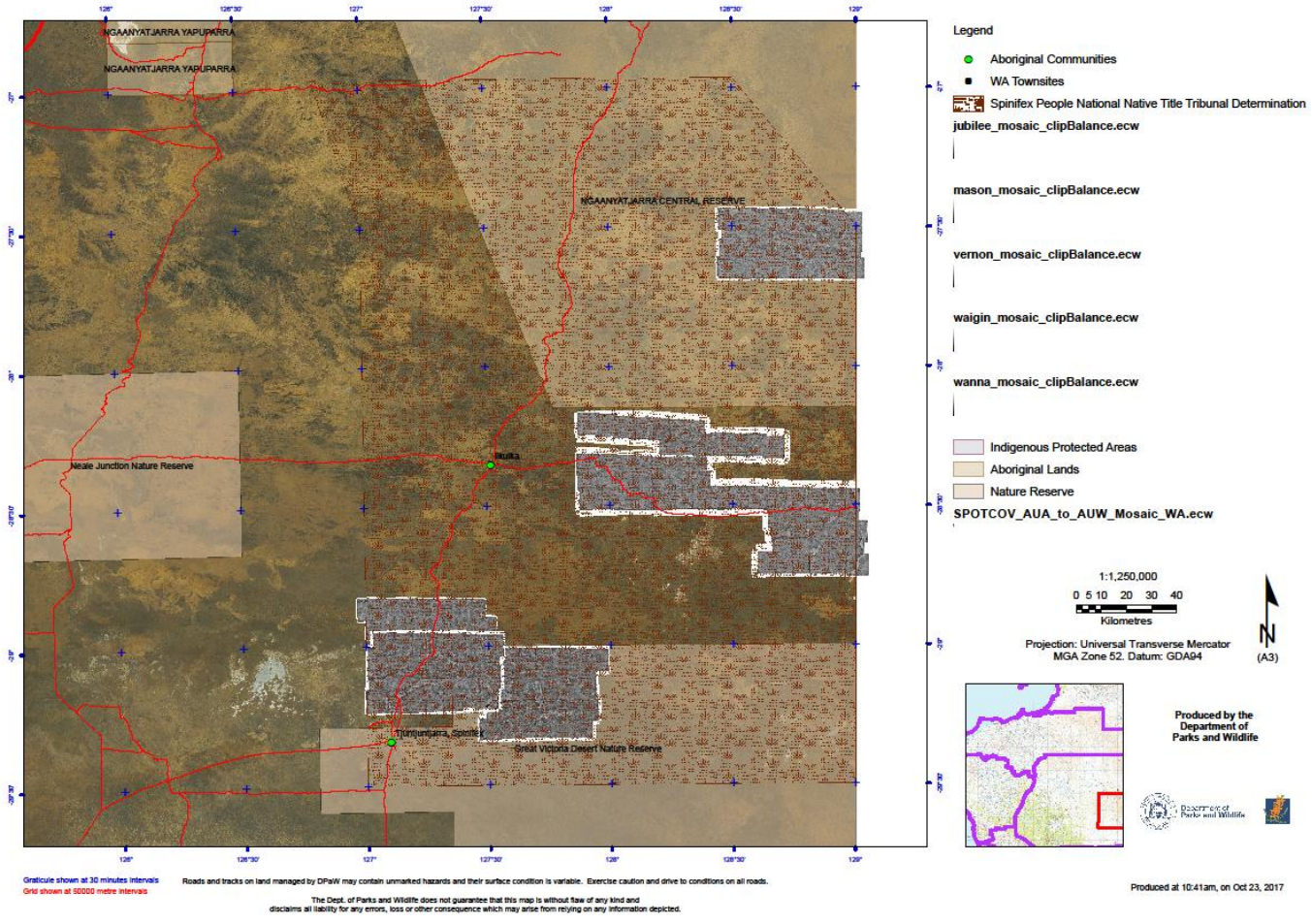

Figure 1: Map showing the location of the 1960/61 aerial photography in relation to the Spinifex Lands. Sampling may need to extend further west for the northern and central photo sample blocks.

As mentioned, I have been unable to conduct interviews with Traditional Owners regarding traditional use of fire. However, as agreed in the Project Contract, $5,000 of the total of $20,000 allocated to this project was made available to the Spinifex Land Management unit (courtesy Sam Doudle) to talk with key elders / informants to obtain information about traditional Aboriginal burning practices in the GVD. A summary of their learnings to date, as provided to me by Sam, is included below. I was interested in an anecdote related to me by Sam that sometimes fires were lit for fun. I heard similar stories when speaking with Pintupi and Martu (people further north) in the late 1980s, who informed me that children in particular occasionally lit fires for 'fun'.

Where and why did people burn on Spinifex?
The individuals that made up the extended family group each had a 'range' where they had the right to live, hunt and gather. The range of an individual extended from where they first touched the earth after birth to where their umbilical cord fell off. An individual also had the right to live, hunt and gather in their mother's range. Therefore, a normal extended family group (probably made up of grandparents, adults and children) had a number of ranges available to them and lived primarily in a particular 'estate' (collection of ranges) depending on food resources and social events and cultural obligations. Individual ranges often overlapped or alternatively could be at some distance from the collective groups' most frequented part of their estate.

The most frequented ranges had a series of water sources on them – rockholes and soaks that the extended family groups rotated around.

A family would live, hunt and gather near a rockhole or soak until water or food resources ran out. While living in that general area, the men would use fire for hunting, e.g. to flush out game and for signalling where they were to those left back at camp. While hunting the men would also burn country in order to ensure that there would be fresh vegetation and therefore an abundance of animals for next time they visited. Women would use fire to flush out smaller game, e.g. tingka (goanna) and to cook maku (witchetty grubs) and other mai (bush vegetable foods).

Once the water and food resources became low, the family would then travel to the next water source in their range. As they travelled they would make fire to signal that they were coming (bush telephone), to clean up country that hadn't been burnt for a while, small fires to catch tingka (goanna), cook maku (witchetty grubs) and other mai (bush vegetable foods). At each evening camp along the way they would burn the area first to payantjaku snakes (banish them from that location) and sometimes chase away mamu (bad spirits).

When they arrived at the next water source there would new kuka (meat animals) and mai attracted by the new growth caused by the previous fires. Animals had also returned because there had been no human activity there for a while.

So within an estate there would be an endless cycle of walking between main water sources, with burning in a radius surrounding the main water source and burning along the path to the next water source. There were large areas in between where Anangu didn't go unless it was a very wet season or because it was culturally inappropriate.

Anangu were very careful to only burn in their own estates as it was bad protocol to burn someone else's estate. Anangu didn't burn at milmilpa (sacred sites).

In addition to learning first hand from elders (see above), I have also read much of the literature in relation to fire use by GVD Traditional Owners. While there are no studies or observations dedicated to this subject, anthropologists and others make reference to it in a number of documents, which I will deal with more extensively, and reference, in my final report. From the published literature, it is clear that fire was (and is) an important tool for acquiring / promoting / protecting food, and was also important for ceremonial and ritual purposes. However, a consistent emergent theme is that fire was used less in the GVD than in other areas of the Western Desert. In my final report, I will explore this apparent divergence in fire use further. I will also synthesise available oral and published information, and together with the aerial imagery, make conclusions about my impressions of pre-historical fire management as well as make recommendations about appropriate contemporary fire management options for the GVD.

Milestone 3

ii) Propose, and reach agreement with the Company Representative, on the format for the digital and printed maps and final report to be delivered under milestone 4.

On completion, fire pattern maps, both those derived from aerial photography and satellite imagery, will be provided in both digital format (shape files, jpeg, etc.) and hard copy, or in whatever practical form the Company Representative so choose. The individual aerial photographs will be provided in digital format, being high resolution scans of the original photographs. The final report will be delivered as a word document and an accompanying power point presentation.

iii) Propose, and reach agreement with the Company Representative, on the agenda, timing, location, format and invitees for the end-of-project presentation to be delivered at the end of milestone 4.

Due to my back injury and consequent inability to work at full capacity, including undertaking field work, I would like to negotiate an extension for the timing of the delivery of Milestone 4 (and the final products).