Background. For almost one hundred years the people of the Kutjungka Region, southeast Kimberley, Western Australia and, in particular, the descendants of those killed in the Sturt Creek massacre, have mourned the loss of relatives they never knew. The deaths of fathers, mothers, brothers, sisters and grandparents in 1922 are now a part of their heritage and knowledge of the massacre is passed to each new generation. Remarkably, few people outside the local area have heard of the massacre at Sturt Creek, no official records from that time have been identified and it is highly likely that the number killed will remain unknown.

Today, 2016, senior Custodians of the massacre site are the descendants of two survivors, one adult and a child who witnessed the event, or the descendants of those who lost their lives. In 2006 members of this descendant group requested Emeritus Professor Jim Bowler to help have their story recorded and the massacre site be documented. In 2009 a funding application by the Kimberley Land Council to the Australian Institute of Aboriginal and Torres Strait Studies (AIATSIS) was successful. The task of co-ordinating the project was given to Dr Pamela Smith, Department of Archaeology, Flinders University. The funding application was approved by the Social and Behavioural Research Ethics Committee, Flinders University, (SABREC) in October, 2008 (SABREC reference 4067). A s.10 application was also lodged with the WA Museum Aboriginal Cultural Material Committee (ACMC) under the WA Aboriginal Heritage Act 1973; although the application had been accepted as a formality, it was not considered necessary as no excavations were proposed and the Traditional Owners had requested and authorised the study and were participating in it.

The Study Area is within the Tjurabalan Native Title Land Aboriginal Corporation and adjacent to the boundaries of the Jaru, Nyining, Walmajarri and Gugadja language groups. Although on Jaru land, those who died in the massacre were both Jaru and Walmajarri speakers and most were from Kutjungka country to the west of Sturt Creek Station (south of Halls Creek, W.A). The location of the Sturt Creek massacre on the northern bank of Chuall Pool is well-known to the Tjurabalan Native Title holders, most of the Custodians now live in the Billiluna and Mulan Aboriginal Communities.

Methodology. A multidisciplinary team comprising Aboriginal Elders, archaeologists, forensic soil scientists, geologist, historians, journalist (audio and video recording) and a biochemical pathologist
were brought together to undertake this project. These people collaborated to form a powerful research team representing three knowledge systems. During the initial planning it was apparent that three cultural ‘ways of knowing’ represented by separate knowledge systems had to be researched, understood and interpreted and then brought together. The most complete source of information was held by the custodians of the massacre site. Knowledge about the event and its location had been passed to Milner Sturt, Boxer Milner and Speiler Sturt by Riwarri, their father and sole adult survivor, and by Clancy, the eldest son of Riwarri who also witnessed the event as a child. Their knowledge has been recorded in paintings and in video and audio interviews.

The second knowledge system is that of the written records of the white people, and in particular, the pastoralists (also the legal ‘Protectors of Aborigines’), police, miners and government departments. These records represented the justice system and were researched in the State Records Office of Western Australia and historic records and diaries held in other locations. The objective was to identify written evidence of the massacre and to understand the underlying reasons for the tensions between the Aboriginal people and the colonising pastoralists during the late nineteenth century and first decades of the twentieth century.

The third knowledge system was the knowledge of scientists and practitioners from the disciplines of archaeology, forensic soil science, pathology, histology and geology who undertook to interpret the data collected during the archaeological survey. Historical research was undertaken throughout 2009-2010 and the archaeological survey was undertaken in September 2009.

*History Wars debate.* This project also addresses the well-reported nation-wide debate about the extent and level of frontier violence in Australia following European colonisation and the extent to which Aboriginal people lost their lives. This debate is commonly referred to as the ‘History Wars’, and was initially polarised around the opposing points of view of two historians, Henry Reynolds and Keith Windschuttle and their supporters. The Sturt Creek Massacre Site project is a part of the Kimberley Frontier Archaeological Project which commenced in 2002 to support Aboriginal perspectives in this debate and was supported by the Executive of the Kimberley Land Council.

*Outcomes.* The research aims and the concept of defining three cultural ‘ways of knowing’ provided a systematic approach to recording and interpreting the data. Once all the data had been recorded each of the ‘three ways of knowing’ were brought together and compared.

Riwarri’s account of the massacre, as recounted by his sons, includes details of his family and others being killed by a police ‘punitive expedition’ at Kaningarra on the Canning Stock Route between wells 48 and 49 (close to Godfrey Tank). At the time they had been cooking a camel and after the police ran out of ammunition, those not killed were constrained by neck chains and forced to walk
south of Billiluna homestead to Lake Stretch and then to old Denison Downs Station. Here they were chained to trees in a stone wall enclosure known as the goat yard.

This took place in October 1922, by which time the homestead had been abandoned for almost twenty years; there is anecdotal evidence that police patrols used abandoned homesteads as their base. According to the Custodians’ account, the massacre followed the well documented murders of Condren and O’Sullivan at Billiluna Station and the subsequent hunt for Banjo, the suspected killer, by a police party led by Constable Flinders. An examination of File no.783 Department of the North West – Aborigines - Cons.653 revealed that a second police party led by Constable J.J. Cooney and which included O’Sullivan’s brother, had spent between October 12 and October 31 on Walmajarri country in the region of Kaningarra engaged in undocumented activities. Following the return of the police party to Billiluna homestead they took a further eight days to travel to Ruby Plains homestead, a period that is unaccounted for and three-four days longer than their journey into the search area a month earlier.

The reports of the archaeologist (bone specialist) and pathologist together with the results of the XRD analysis of the bone fragments by forensic scientists at the CSIRO Division of Land and Water support the Custodians’ account of the massacre. During the archaeological survey highly fragmented burnt bone was identified in the goat yard and at the ‘women and children’ site, with the most positive results obtained from samples of pyre debris in the goat yard (that is, a number of soil samples containing small fragile fragments of bone). These were two of three sites shown to the archaeologists by the Custodians. The third site, a well, was dug out by the Aboriginal people. The soil is described as highly disturbed ‘fill’ with no soil profile and two halves of a single bovine rib at different levels within the well. The Custodians reported that the contents of the well were unlike their previous visit several years earlier.

Soil samples were collected and bagged from a number of sites. All bone fragments were recovered from the soil samples in the laboratory and no morphological characteristics or teeth were positively identified following microscopic examination and analysis by the pathologist, Emeritus Professor Vernon-Roberts. The results from the examination of the majority of the fragments were inconclusive. The report of the pathologist regarding Specimens GY2 and GY3 (samples from the goat yard), however, described them as being similar in structure and he commented that ‘... while they have meagre features supporting a human skeletal origin it is possible that they are fragments of bone from the vault of the skull. This latter possibility would be strengthened if there was evidence that that they had been exposed to extreme heat as partial calcination may have occurred.’
Sixteen bone fragments were examined by Mark Raven and Professor Rob Fitzpatrick, CSIRO Land and Water Division. These were photographed using a Wild Leitz stereomicroscope and a Lumenera 10MP colour digital camera. Small sub-samples were removed and ground in an agate mortar and pestle and the fine powders sprinkled onto Si low background holders for XRD analysis. XRD patterns were recorded with a PANalytical X’Pert Pro Multi-purpose Diffractometer using iron filtered Co Ka radiation, variable divergence slit and fast X'Celerator Si strip detector. The diffraction patterns were recorded in steps of 0.0167° 2-theta with total counting time of 30 minutes, and logged to data files for analysis using HighScore Plus from PANalytical and in-house XPLOT. Estimates of crystallite size were performed with TOPAS from Bruker AXS on the XRD data using a crystal structure determination from bone hydroxylapatite. The crystallite size determined by XRD is limited by the inherent resolution of the instrument, which is estimated to approximately 700nm.

Heating experiments on samples of dried animal bone (sheep) were also performed at temperatures of 200, 400, 500, 550, 600, 650, 700, 800 and 1100°C over time intervals of 1, 2, 3, 4, 8, 16, 32, 64, 120 hours. The bone heated to 550°C was also heated over longer intervals up to 300 hours. Crystallite size was determined at each temperature and duration and compared against the crystallite sizes determined for the bone fragments.

**Results:** The photographs, XRD patterns and estimations of crystallite size and approximate temperature and duration were recorded for each fragment and one example is illustrated below:

*Sturt Creek Site 16 Bone fragment 10 (6.3x Mag, FOV=24mm) – Figure 54*
All of the light brown to white coloured fragments appear to have been heated to high temperatures (>800°C) for short periods of time or lower temperatures (600-700°C) for many days. All fragments that are dark or black in colour have low crystallite sizes. An observation made whilst performing the heating tests was that the colour change from dark to light usually occurred about the same time as the crystallite size increased. It is likely the reason the crystallite size takes such a long period of time at lower temperatures is the access of oxygen to oxidize the organic matter between the bone crystallites. The black fragments seem to indicate that during heating these bone fragments are under reducing conditions and the organic matter has converted to carbon instead of CO2. Therefore the carbon has inhibited the bone fragments from re-crystallizing.

Evidence of the bone fragments having been exposed to extreme heat was provided by the XRD analysis of bone fragments from both the goat yard and the ‘women and children’ site. The researchers are confident that all of the bone fragments analysed from Sturt Creek had been subjected to temperatures of either 600°C for more than 80 hours, 650°C for more than 20 hours, 700°C for more than 4 hours or 800°C for more than 1 hour. These results are based on
measurements of clean animal bone (i.e. no adhering flesh) at each of the temperatures over many hours. These high temperatures and the prolonged period of burning are considerably greater than the hearth fire of a hunter/gatherer, the temperatures of which were also tested. Only highly fragmented and fragile burnt bone was present at each of the collection sites; all bone was on the surface and there was no other archaeological evidence or debris of a meal (whether Aboriginal or European) and no hearth material or cooking stones were present. No evidence of hydrocarbons was found in association with the bone fragments due to the age of the bone and desert conditions.

Discussion. It is concluded that two massacres of Aboriginal people took place following the murder of Condren and Sullivan at Billiluna homestead in 1922. The first was at Kaningarra on the Canning Stock Route and at this time no physical evidence or documentation has been located. The second massacre was at the old Denison Downs homestead on Chuall Pool, Sturt Creek Station. The police party led by Constable J.J. Cooney was a punitive expedition and his report failed to fully account for over three weeks whilst they were supposedly searching for Banjo, suspected of killing Condren and O’Sullivan. Constable Cooney’s police report also confirmed they were in the same area as the reported massacre at Kaningarra,

The pathology report commented on the probability of one bone fragment being from the vault of a human skull, provided there was evidence of it being subjected to an extremely high temperature. The XRD analysis demonstrated that bone fragments had been subjected to extremely high temperatures and the use of a fire accelerant, most probably kerosene, to destroy the human remains was referred to in the oral history by Daisy Kunga. Based on all of the information presented in the report it was concluded that the forensic soil analysis, pathologist’s report, archaeologists’ reports, the archaeological survey and historical research support the oral history of the Custodians, that is, an unknown number of people were killed at old Denison Downs Station on Sturt Creek, south-east Kimberley Region. In addition, all evidence, or lack of it, in the police report provides compelling evidence of police involvement in both massacres. They were at the right place at the right time and had both the motive and the means to shoot those killed.

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